Scottish House Condition Survey

The Scottish Government
Riaghaltas na h-Alba

# Scottish House Condition Survey

## Key Findings 2011

A National Statistics Publication for Scotland

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# 1 Introduction

1. The Scottish House Condition Survey (SHCS) is the only national survey of housing and households undertaken in Scotland. It combines both an interview with occupants and a physical inspection of dwellings to build up a picture of Scotland's occupied housing stock which covers all types of households and dwellings across the entire country - whether owned or rented, flats or houses.

2. The format of the SHCS allows the physical data recorded by professional, trained surveyors to be combined with the social data from the interview with the householder. This 'social' interview covers a range of topics such as household characteristics, tenure, neighbourhood satisfaction, dwelling satisfaction, health status, income. The result is a powerful data set for examining the condition and standard of dwellings and the views and experience of the people living in those dwellings.

3. This is the eighth 'Key Findings' report since the SHCS changed to a continuous format in 2003. Before 2003, surveys were conducted in 1991, 1996 and 2002 and typically consisted of about 15,000 paired social interviews and physical surveys.

4. The continuous format was introduced to allow more flexibility of content and to assist in the monitoring of Ministerial targets. The 2003/4[1], 2004/5, 2005/6, 2007, 2008, 2009, 2010 and, now, the 2011 surveys each gathered data from almost 4,000 households and dwellings with paired social and physical data available for around 3,000 of these. A similar sample size to the previous surveys (15,000 cases) is achieved over each five year period since the continuous format was introduced.

5. In 2009, the SHCS was designated as a National Statistics product by the UK Statistics Authority (UKSA). This demonstrates that the SHCS statistics are accurate, trustworthy and compliant with the high standards required of National Statistics.

6. The results in this report are based on fieldwork from January to December 2011. Given the sample size of around 3,000 paired households, it is not possible to provide in-depth estimates for a number of topics. Therefore this report sets out key, high-level, national estimates relevant to a number of important policy areas.

7. Subsequent chapters cover the following key findings from the Scottish House Conditions Survey:

    - **Key Attributes of the Scottish Housing Stock:** this covers key indicators such as dwelling type and age, and whether a dwelling is on or off the gas grid.
    - **Energy Efficiency:** this chapter presents an analysis of the energy efficiency of the housing stock including presence and level of insulation.

[1] The first 3 years of the continuous survey ran from October to September. In 2007 the survey changed to calendar years.

Further analysis is based on three energy efficiency measures: the National Home Energy Rating (NHER); the UK Government's Standard Assessment Procedure for the Energy Rating of Dwellings (SAP, 2005); and approximated Energy Efficiency Ratings (EERs) as found in Energy Performance Certificates (EPC). Also included in this chapter are modelled mean and total $CO_2$ emissions.

- **Fuel Poverty:** this chapter presents an analysis of the number and characteristics of households in fuel poverty and extreme fuel poverty.
- **Housing Quality:** this part of the report provides estimates of the number of dwellings passing and failing the tolerable standard and the Scottish Housing Quality Standard (SHQS). It also covers dampness, condensation and disrepair.
- **Notes and Definitions:** the final chapter provides information about the content of the survey and the key concepts used in this report. Discussion on the reliability of the estimates is also included.

8. Care needs to be taken when comparing estimates in this report with those from the 1991, 1996 and 2002 reports. Some features of the survey have not altered consisting, as it does, of a social interview followed by a physical inspection. However, the use of continuous, year-round fieldwork was a basic change in the methodology introduced in 2003/4 and cannot be discounted as a possible explanation of change.

9. For 2007 to 2011, the SHCS changed contractors from the Office for National Statistics to Ipsos-MORI. We can not discount the possibility that this may have caused some year-on-year changes.

10. Care must also be taken in comparing dwelling numbers (rather than proportions) between each survey year as the base number of occupied dwellings changes. Population totals on the number of dwellings in the SHCS are obtained by weighting the survey results to estimates of the number of households in Scotland published by National Records of Scotland (previously GROS)[2] for 2002, 2003/4, 2007, 2008, 2009, 2010 and 2011 or the number of occupied dwellings derived from CTAXBASE[3] data on chargeable dwellings supplied by each of Scotland's LAs (for 2004/5 and 2005/6). The number of occupied dwellings used in the SHCS for each survey year are shown in Table 1.

**Table 1** Base number of dwellings by survey year, 2003/4-2011, (000s)

| Survey Year | 2003/4 | 2004/5 | 2005/6 | 2007 |
|---|---|---|---|---|
| Dwellings (000s) | 2,269 | 2,301 | 2,315 | 2,314 |
| **Survey Year** | **2008** | **2009** | **2010** | **2011** |
| Dwellings (000s) | 2,331 | 2,344 | 2,357 | 2,368 |

*Source: Continuous SHCS*

[2] NRS. *Estimates of Households and Dwellings in Scotland,* 2011
[3] http://www.scotland.gov.uk/Topics/Statistics/Browse/Local-Government-Finance/DatasetsCouncilTax

11. The growth of the Scottish housing stock can give the impression that more dwellings now fall into certain categories (more owner occupiers for example) so it may be important to compare rises in proportions as well as numbers.

12. The SHCS is a sample survey. All survey figures are therefore estimates of the true prevalence within the population and will contain some error associated with sampling variability. However the likely size of such variability can be identified, by taking account of the size and design of the sample. Sections 6.1 - 6.3 provide further discussion of confidence intervals and sampling errors associated with estimates of proportions for characteristics directly observed in the survey.

13. In addition to sampling variation, there are other sources of uncertainty such as those arising from incomplete responses or failure to secure participation in the survey from each sampled household. Such errors have not been quantified.

14. Different types of estimates are subject to differing levels of uncertainty associated with sampling and design. For example estimates of change (i.e. figures relating to comparisons across survey years) are generally subject to greater sampling error than point-in-time estimates (i.e. figures relating to one survey year only) and such errors would be understated by figures in Table 41 in Section 6. There is more uncertainty associated with complex measures, such as the fuel poverty rate and this is not fully captured by figures in Table 41.

# 2 Key Attributes of the Scottish Housing Stock

15. Table 2 and Figure 1 show the age of the 2011 housing stock by dwelling type[4]. They show that detached houses have dominated new-builds since 1982. This differs from dwellings from earlier periods; a large proportion of remaining pre-1919 dwellings are tenements, whilst dwellings from the 1945-1982 period are predominantly semi-detached and terraced housing. Definitions of the dwelling types used in the SHCS can be found in paragraph 167.

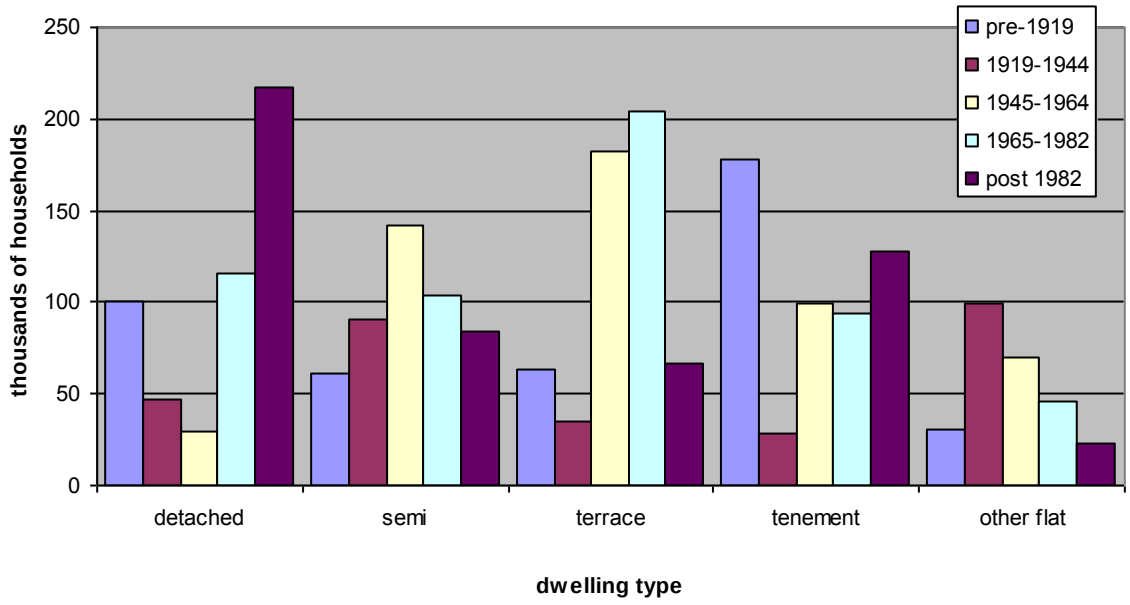
16. Table 3 shows that about one fifth of the stock is now over 92 years old and a third of the housing stock is over 67 years old. Twenty-two percent of the stock has been built within the last 30 years.

**Table 2** Type of dwelling by age of dwelling (000s)

| Age of dwelling | Detached<br>000s | Semi-detached<br>000s | Terraced<br>000s | Tenement<br>000s | Other flats<br>000s | Total<br>000s | *Unweighted sample size* |
|---|---|---|---|---|---|---|---|
| Pre 1919 | 100 | 61 | 63 | 178 | 56 | **459** | *590* |
| 1919-1944 | 47 | 91 | 35 | 29 | 100 | **303** | *422* |
| 1945-1964 | 29 | 142 | 182 | 100 | 70 | **523** | *747* |
| 1965-1982 | 115 | 103 | 204 | 94 | 48 | **565** | *768* |
| Post-1982 | 217 | 84 | 67 | 128 | 23 | **519** | *692* |
| **Total** | **509** | **482** | **551** | **529** | **297** | **2,368** | ***3,219*** |
| *Unweighted sample size* | *801* | *691* | *781* | *557* | *389* | ***3,219*** | |

*Source: SHCS 2011*

**Figure 1** Type of dwelling by age of dwelling (000s)




*Source: SHCS 2011*

[4] 'Other flats' is made up of 4-in-a-block, tower/slab and flat from converted house.

**Table 3** Type of dwelling by age of dwelling (Column %)

| Age of dwelling | Detached % | Semi-detached % | Terraced % | Tenement % | Other flats % | Total % |
|---|---|---|---|---|---|---|
| Pre 1919 | 20 | 13 | 11 | 34 | 19 | **19** |
| 1919-1944 | 9 | 19 | 6 | 5 | 34 | **13** |
| 1945-1964 | 6 | 29 | 33 | 19 | 24 | **22** |
| 1965-1982 | 23 | 21 | 37 | 18 | 16 | **24** |
| Post-1982 | 43 | 17 | 12 | 24 | 8 | **22** |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** |
| *Unweighted sample size* | *801* | *691* | *781* | *557* | *389* | ***3,219*** |

*Source: SHCS 2011*

17. The SHCS includes a variable covering whether dwellings are on or off the gas-grid. Dwellings are classified as 'on the gas grid' if there is a medium/low pressure gas pipe in the 'mapping area'[5]. Further analysis of households which are on or near a gas grid shows whether they use gas for heating.

18. Table 4 shows the figures for whether a dwelling is on or off the gas grid by urban/rural indicator. It shows that 99% of dwellings in urban areas are on or near the gas grid compared to 48% of dwellings in rural areas. Overall in Scotland, 91% of dwellings are on the gas grid.

**Table 4** Dwellings on/off the Gas Grid by urban/rural indicator (000s and %)

| Gas Grid Coverage | | Urban | Rural | Total | *Un-weighted sample size* |
|---|---|---|---|---|---|
| On gas grid | 000s | 1,956 | 191 | **2,147** | *2,723* |
| | Row % | 91 | 9 | **100** | |
| | Col % | 99 | 48 | **91** | |
| Not on gas grid | 000s | 12 | 206 | **218** | *493* |
| | Row % | 6 | 94 | **100** | |
| | Col % | 1 | 52 | **9** | |
| **All Dwellings** | 000s | **1,969** | **397** | **2,365** | ***3,216*** |
| | Row % | **83** | **17** | **100** | |
| | Col % | **100** | **100** | **100** | |
| *Unweighted sample size* | | *2,497* | *719* | ***3,216*** | |

*Source: SHCS 2011*

[5] Note this is different from the classification used by Scottish Gas where the dwelling has to be within 23m of a medium/low pressure gas pipe to be on the gas grid. SHCS houses are mapped by postcode, reducing the accuracy of dwelling location to 0.5 km.
Maps of existing gas grid infrastructure are kindly supplied by Scotia Gas Networks.

# 3 Energy Efficiency

19. The overall energy use of a household depends on the energy efficiency of the dwelling plus the behaviour of the occupants. The SHCS does not record the behaviour of occupants but concentrates on the energy efficiency of the dwelling. However it does ask respondents to what extent they monitor their energy use (see section 3.1).

20. The energy efficiency of a dwelling depends on its physical characteristics. Factors such as the age of dwelling, the type of dwelling and the extent of loft and wall insulation all affect the efficiency. The efficiency of the boiler and the type of fuel used for space and water heating, as well as cooking are also factors.

21. Energy efficiency is measured using two methodologies: the National Home Energy Rating (NHER) and the UK Government's Standard Assessment Procedure for the Energy Rating of Dwellings (SAP, 2005 ). The NHER considers all energy use in the home including cooking and electrical appliances and allows for regional and geographic climate variations. The SAP considers energy used by space heating (with auxiliary equipment) and hot water and lighting (under SAP 2005), and uses a single UK climate source in East Yorkshire. Both measures are modelled using standard heating regimes and do not take into account the behaviours of individual households.

22. In this chapter we report on analysis of:

- levels of insulation in Scottish dwellings (section 3.2)
- NHER (section 3.3) and SAP (2005) (section 3.4) ratings
- results obtained by approximating the Energy Performance Certificates Energy Efficiency Ratings (EPC EER) methodology using SHCS data (section 3.5)
- modelled $CO_2$ emissions from dwellings (section 3.6)

## 3.1 Monitoring Energy Use

23. Since 2008 the SHCS has asked respondents to what extent they monitor the energy use in their property. Table 5 shows responses to this question. Since 2008 there has been very little variation.

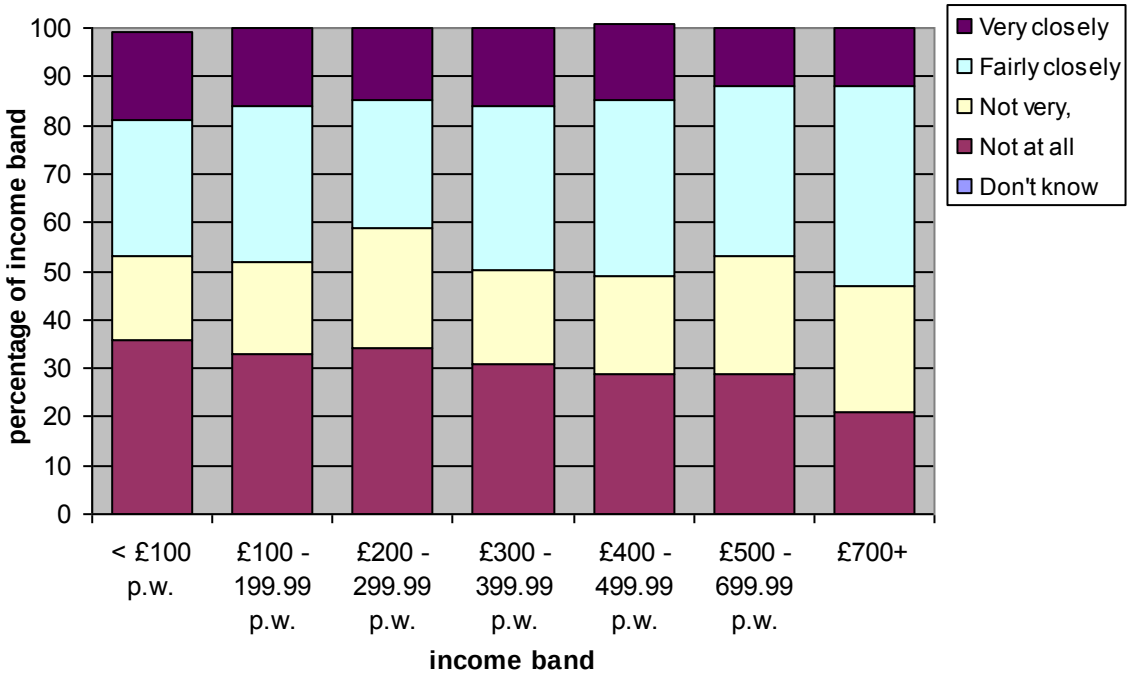
24. In 2011, about 33% of households said they monitor their energy use fairly closely and 14% said they monitor it very closely. Figure 2 shows the extent of energy monitoring by net weekly household income band. It shows that there is little difference between income bands - with around 50% of each income band monitoring their energy use either very or fairly closely.

**Table 5** Extent to which energy use is monitored, 2008 to 2011 (%)

| Extent energy use is monitored | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Very closely | 11 | 13 | 12 | 14 |
| Fairly closely | 33 | 34 | 33 | 33 |
| Not very closely | 24 | 25 | 23 | 22 |
| Not at all | 31 | 28 | 32 | 30 |
| Don't know | 1 | 0 | 0 | 0 |
| ***Total*** | ***100*** | ***100*** | ***100*** | ***100*** |
| ***Unweighted total*** | *3,762* | *4,153* | *3,853* | *3,949* |

*Source: Continuous SHCS*

**Figure 2** Extent to which energy use is monitored within property by net weekly household income band (%)




*Source: SHCS 2011*

25. Although the extent to which householders monitor their energy use has not changed a great deal over the period 2008 to 2011, the prevalence of energy monitoring devices has continued to rise steadily. Table 6 shows the growing prevalence of energy monitoring devices – an additional 120,000 since 2008 representing 7% of all households in Scotland.

**Table 6** Energy–use monitoring devices, 2008 to 2011 (000s and %)

| Year | | Do you have an energy-use monitoring device in your home? Yes | No | Don't know | Total | Sample Size |
|---|---|---|---|---|---|---|
| **2008** | *000s* | 37 | 2,286 | 8 | 2,331 | *3,762* |
| | *%* | 2 | 98 | 0 | 100 | |
| **2009** | *000s* | 54 | 2,285 | 6 | 2,344 | *4,153* |
| | *%* | 3 | 97 | 0 | 100 | |
| **2010** | *000s* | 101 | 2,254 | 3 | 2,357 | *3,853* |
| | *%* | 4 | 96 | 0 | 100 | |
| **2011** | *000s* | 155 | 2,209 | 4 | 2,368 | *3,949* |
| | *%* | 7 | 93 | 0 | 100 | |

*Source: Continuous SHCS*

## 3.2 Insulation measures

26. Installing or upgrading insulation is one of the easiest and most effective ways to improve the energy efficiency of a dwelling. It is estimated that in an uninsulated dwelling a third of all heat lost is through the walls and a quarter of heat is lost through the roof[6].

27. In an amendment to the Housing (Scotland) Act in 2006, the tolerable standard was redefined to include a clause that dwellings must have satisfactory thermal insulation. This means that any dwelling with no loft insulation is classified as being Below Tolerable Standard (BTS) and by definition it is not reasonable to expect people to continue to live in a house that falls below this standard. Local authorities have a statutory duty and specific powers to deal with houses that fall below the tolerable standard. This applies to all dwellings in Scotland. More information on BTS is available in Chapter 5.

### 3.2.1 Loft insulation

28. Table 7 and Figure 3 show the levels of loft insulation in all dwellings. A dwelling is classified as 'not applicable' for loft insulation if it has a flat roof or another dwelling above it (i.e. a mid- or ground-floor flat).

29. Since 2003/04 the number of dwellings with no insulation has fallen and in 2011 represented just 32,000 dwellings, or 2% of those that could have loft insulation compared to 6% in 2003/04. The thickness of this insulation also increased so that 45% of dwellings with lofts had insulation depth of 200 mm or more in 2011, compared with 14% in 2003/04, with much of the increase occurring since 2007.

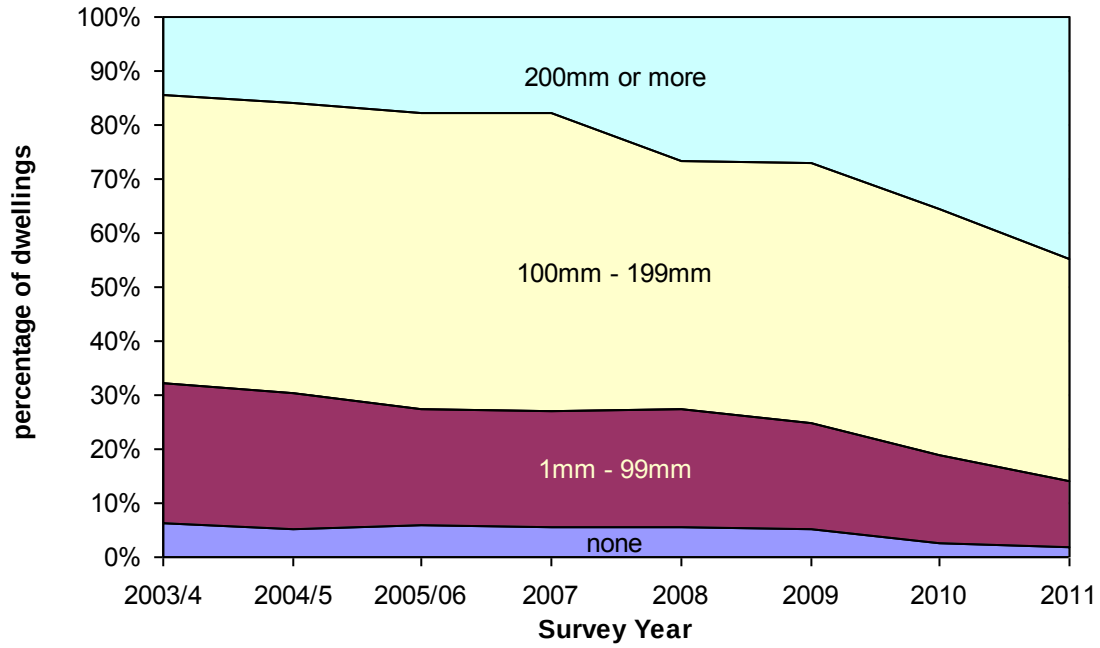
[6] http://webarchive.nationalarchives.gov.uk/20111030144753/energysavingtrust.org.uk/in-your-home/roofs-floors-walls-and-windows

**Table 7** Depth of loft insulation (000s), 2003/04 to 2011

| | Survey Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Loft insulation** | **2003/4** | **2004/5** | **2005/06** | **2007** | **2008** | **2009** | **2010** | **2011** |
| none | 110 | 96 | 104 | 99 | 101 | 96 | 46 | 32 |
| 1mm - 99mm | 462 | 460 | 384 | 384 | 386 | 349 | 284 | 225 |
| 100mm - 199mm | 953 | 982 | 987 | 987 | 818 | 872 | 806 | 745 |
| 200mm or more | 258 | 289 | 315 | 315 | 471 | 485 | 628 | 812 |
| Not applicable | 486 | 472 | 524 | 524 | 555 | 542 | 593 | 554 |
| **All dwellings** | 2,269 | 2,301 | 2,315 | 2,309 | 2,331 | 2,344 | 2,357 | 2,368 |
| *Unweighted total* | *3,090* | *3,103* | *3,147* | *3,032* | *3,015* | *3,346* | *3,115* | *3,219* |

*Source: Continuous SHCS*

**Figure 3** Depth of loft insulation (where applicable), 2003/04 - 2011




*Source: Continuous SHCS*

30. Table 8 shows in more detail the depth of loft insulation (where this measure is applicable) in 2010 and 2011. Dwellings in the social sector had a higher proportion of better insulated lofts than those in the private sector. 84% of private housing were insulated to 100 mm or more, and 42% of these exceeded 200 mm, whereas 94% of social dwellings had lofts insulated to 100 mm or more, and 57% of those had over 200 mm of loft insulation.

31. One of the reasons behind this is that the Scottish Housing Quality Standard (SHQS) requires at least 100 mm of loft insulation. All social rented dwellings must meet the SHQS by 2015 (see section 5.1 for more information).

32. Since 2010, loft insulation improved overall (see Table 8):

- The proportion of all housing with 100 mm or more increased 5 percentage points on 2010 levels.
- Private housing saw a similar improvement with a 4 percentage point increase since 2010, from 79% to 84%.

- Very good insulation beyond 300 mm improved a further 4 percentage points from 6% in 2010 to 10% in 2011.
- An estimated 14,000 fewer dwellings had no loft insulation at all.

Due to prior treatment of social housing, the majority of this improvement came from the private sector.

**Table 8** Depth of loft insulation (000s and %) by tenure, 2011 and 2010

| | | Private Sector | | Social Sector | | All Tenures | |
|---|---|---|---|---|---|---|---|
| | **Roof/loft insulation** | *000s* | *%* | *000s* | *%* | *000s* | *%* |
| **2011** | None | 31 | 2 | 1 | 0 | 32 | 2 |
| | 1mm - 99mm | 201 | 14 | 24 | 6 | 225 | 12 |
| | 100mm - 199mm | 599 | 42 | 146 | 37 | 745 | 41 |
| | 200mm - 299mm | 452 | 32 | 175 | 45 | 628 | 35 |
| | 300mm and more | 137 | 10 | 47 | 12 | 184 | 10 |
| | **Total** | **1,420** | **100** | **394** | **100** | **1,814** | **100** |
| **2010** | None | 46 | 3 | 1 | 0 | 46 | 3 |
| | 1mm - 99mm | 243 | 18 | 41 | 10 | 284 | 16 |
| | 100mm - 199mm | 641 | 47 | 165 | 42 | 806 | 46 |
| | 200mm - 299mm | 379 | 28 | 151 | 38 | 530 | 30 |
| | 300mm and more | 64 | 5 | 34 | 9 | 98 | 6 |
| | **Total** | **1,373** | **100** | **392** | **100** | **1,764** | **100** |

*Source: SHCS 2011 and 2010*

### 3.2.2 Wall insulation

33. Most types of walls can be insulated in one way or another. In Scotland around three quarters of external walls are cavity walls and one quarter are solid or other walls. Other types include steel- frame dwellings and dwellings made from pre-fabricated concrete. These types, along with solid walls, may be classified as 'hard to treat' because low-cost cavity wall insulation (CWI) is not viable.

34. CWI installations are becoming increasingly difficult to identify as over time the injection holes age, fade or are covered up by later work. Contractors are also getting better at disguising their work. This may mean that we under estimate the number of homes which have had CWI installed.

35. CWI is not suitable for dwellings located in very exposed or wet areas. The survey is unable to collect this information, so it could be overestimating the number of cavity walls that are suitable for CWI.

36. Table 9 shows the number and percentage of external walls which are insulated as of 2011. Solid and other wall types are less likely to have insulation than cavity walls. Since 2007 the proportion of insulated cavity walls has increased from 53% to 66% in 2011. This compares to 9% of solid/other walled dwellings with insulation in 2007, rising to 11% in 2011.

**Table 9** Exposed wall insulation by wall construction, 2007 to 2011[7]

| External Wall Construction | Insulation Added? | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Solid/Other (000s) | Not insulated | 523 | 541 | 540 | 542 | 546 |
| | Insulated | 50 | 56 | 57 | 68 | 68 |
| | Sub total | 573 | 597 | 597 | 611 | 614 |
| Cavity (000s) | Not insulated | 816 | 766 | 732 | 671 | 600 |
| | Insulated | 924 | 967 | 1,015 | 1,076 | 1,154 |
| | Sub total | 1,740 | 1,733 | 1,747 | 1,747 | 1,754 |
| **All dwellings** | | **2,313** | **2,330** | **2,344** | **2,357** | **2,368** |
| Solid/Other (%) | Not insulated | 91% | 91% | 90% | 89% | 89% |
| | Insulated | 9% | 9% | 10% | 11% | 11% |
| | Sub total | 100% | 100% | 100% | 100% | 100% |
| Cavity (%) | Not insulated | 47% | 44% | 42% | 38% | 34% |
| | Insulated | 53% | 56% | 58% | 62% | 66% |
| | Sub total | 100% | 100% | 100% | 100% | 100% |

*Source: Continuous SHCS*

37. Higher insulation levels have been required by building regulations since 1982 but, as shown in Table 10, action has been taken to improve pre-1983 dwellings by installing wall insulation. Energy efficiency is a criterion of the Scottish Housing Quality Standard, which applies to social housing (see section 5.1).

38. Social landlords have conducted significantly more work to improve dwellings overall. In the social sector, 44% of pre-1976 dwellings remain untreated compared with 69% in the private sector. The majority of work done has been to fill cavity walls (27% in the private sector and 36% in the social sector), which is generally the lowest cost improvement available.

39. The social sector has seen the greatest uptake of more expensive measures, where exposed walls are clad externally or internally with insulating material. As of 2011 nearly 20% (including those with both insulation types) of pre-1983 social sector housing had undergone such treatment compared with around 4% of private sector housing.

**Table 10** Additional insulation in pre-1983 dwellings by Tenure

| Insulation Added Post-Contruction | Private Sector 000s | Private Sector % | Social Sector 000s | Social Sector % | Total 000s | Total % |
|---|---|---|---|---|---|---|
| None | 906 | 69% | 232 | 44% | 1,138 | 62% |
| Cavity | 359 | 27% | 190 | 36% | 548 | 30% |
| Internal or External Cladding | 47 | 4% | 96 | 18% | 143 | 8% |
| Multiple types | 5 | 0% | 6 | 1% | 10 | 1% |
| **Total** | 1,316 | 100% | 523 | 100% | 1,840 | 100% |
| *Sample Size* | *1,826* | | *685* | | *2,511* | |

*Source: SHCS 2011*

[7] It is assumed that all post-1982 dwellings are insulated due to the higher levels of energy efficiency required by building regulations.

## 3.3 National Home Energy Rating (NHER)

40. The SHCS uses NHER to rate dwellings on a scale of 0 (poor) to 10 (excellent) based on the total energy costs per square metre of floor area[8]. Further information on NHER and SAP is provided in paragraphs 170 - 175. More detailed analysis and discussion can be found in the *SHCS 2002 National Report*[9] and in *Energy Efficiency and Estimated Emissions for the Scottish Housing Stock 2003/4*[10].

41. In 2011 it was not possible to determine NHER or SAP scores for 28 cases in the survey. These cases are excluded from any energy efficiency analysis.

42. Table 11 shows that in 2011 the most common energy rating of dwellings on the NHER scale is 8, the mean is 6.9 and the median 7. The proportion of dwellings rated with an NHER score of 8 or more was 46%, an increase of 6 percentage points on the corresponding figure from 2010.

**Table 11** Dwellings by NHER scores (000s and %), mean and median values, 2010 and 2011

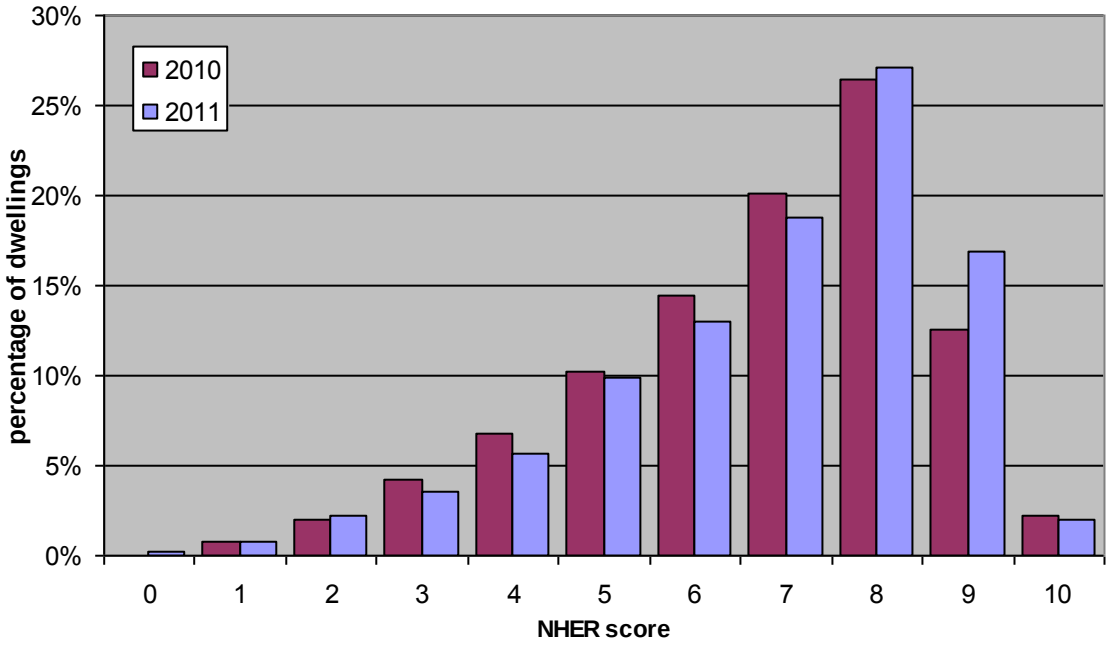
| | 2010 | | | 2011 | | |
|---|---|---|---|---|---|---|
| **NHER score** | *000s* | *%* | *Sample Size* | *000s* | *%* | *Sample Size* |
| 0 | 1 | 0 | *5* | 4 | 0 | *6* |
| 1 | 18 | 1 | *28* | 18 | 1 | *35* |
| 2 | 48 | 2 | *78* | 53 | 2 | *97* |
| 3 | 98 | 4 | *161* | 84 | 4 | *131* |
| 4 | 159 | 7 | *251* | 133 | 6 | *215* |
| 5 | 238 | 10 | *363* | 232 | 10 | *338* |
| 6 | 336 | 14 | *450* | 306 | 13 | *431* |
| 7 | 470 | 20 | *605* | 440 | 19 | *580* |
| 8 | 617 | 26 | *745* | 636 | 27 | *827* |
| 9 | 294 | 12 | *334* | 396 | 17 | *480* |
| 10 | 53 | 2 | *53* | 47 | 2 | *51* |
| **Sub-total** | **2,330** | **99** | ***3,073*** | **2,349** | **99** | ***3,191*** |
| Unobtainable | 27 | 1 | *42* | 19 | 1 | *28* |
| **Total** | **2,357** | **100** | ***3,115*** | **2,368** | **100** | ***3,219*** |
| | | **95% Confidence** | | | **95% CI** | |
| | | **lower** | **upper** | | **lower** | **upper** |
| **Mean** | **6.71** | 6.64 | 6.78 | **6.86** | 6.79 | 6.93 |
| **Median** | **7** | | | **7** | | |

*Source: SHCS 2010-11*

43. Since 2010, 100,000 additional dwellings had achieved an NHER score of 9. The proportion of dwellings scoring 9 or 10 saw a 5 percentage point increase from 14 to 19 %.

[8] The SHCS provides an "enhanced level 0" evidence base for NHER modelling.
[9] Revised energy efficiency figures from the SHCS 2002 National Report are available to download at http://www.scotland.gov.uk/Topics/Statistics/SHCS/NationalReportChap11
[10] Energy Efficiency and Estimated Emissions for the Scottish Housing Stock is available to download at http://www.scotland.gov.uk/Publications/2006/12/18132350/0

**Figure 4** The percentage of dwellings by NHER score, 2010 and 2011




*Source: SHCS 2010/11*

44. NHER scores may be banded such that a score of 7 or higher is considered 'good' and a rating of 2 or lower is 'poor'. Table 12 shows that, in 2011, 65% of dwellings were rated 'good' and 3% 'poor'.

**Table 12** NHER band (000s and %)

| NHER band | 000s | % | *Unweighted sample size* |
|---|---|---|---|
| Poor (0-2) | 76 | 3 | *138* |
| Moderate (3-6) | 755 | 32 | *1,115* |
| Good (7-10) | 1,519 | 65 | *1,938* |
| Unobtainable | 19 | | *28* |
| **Total** | **2,368** | **100** | ***3,219*** |

*Source: SHCS 2011*

45. Table 13 and Figure 5 show how the energy efficiency of the housing stock improved since 2003/4. In 2011 the mean and median NHER scores were 6.9 and 7, continuing the rising trend from 2003/4, when they were 5.8 and 6 respectively. In 2003/4, an estimated 40% of dwellings achieved a 'good' rating of 7 or above. By 2011 this proportion had risen to 65%.

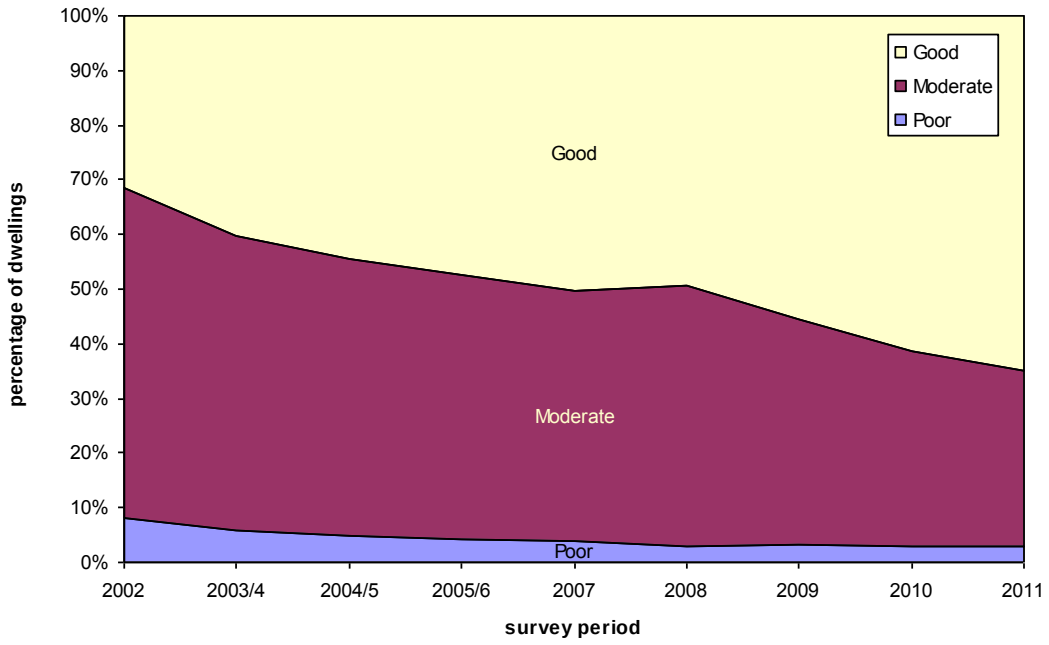
46. Table 13 shows that the energy efficiency of social rented dwellings is better than that for the stock as a whole. However the proportion of both social and private stock achieving a 'good' rating increased by 20 or more percentage points since 2003/4. In 2011, 76% of social rented dwellings had a 'good' NHER rating, compared to 56% in 2003/4. Over the same period, the proportion of private sector dwellings rated 'good' rose from 35% to 61%.

**Table 13** Banded NHER by Tenure, 2003/4-2011 (Row %)

| Year | NHER Band (Row %) | | | Mean | Median | Sample size |
|---|---|---|---|---|---|---|
| | *Poor* | *Moderate* | *Good* | | | |
| **All Tenures** | | | | | | |
| 2003/4 | 6 | 54 | 40 | 5.8 | 6 | *3,088* |
| 2004/5 | 5 | 51 | 44 | 5.9 | 6 | *3,085* |
| 2005/6 | 4 | 48 | 47 | 6.1 | 6 | *3,146* |
| 2007 | 4 | 46 | 50 | 6.2 | 7 | *3,016* |
| 2008 | 3 | 48 | 49 | 6.3 | 6 | *3,006* |
| 2009 | 3 | 41 | 55 | 6.5 | 7 | *3,324* |
| 2010 | 3 | 36 | 62 | 6.7 | 7 | *3,073* |
| 2011 | 3 | 32 | 65 | 6.9 | 7 | *3,191* |
| **Private Sector** | | | | | | |
| 2003/4 | 8 | 58 | 35 | 5.5 | 6 | *2,220* |
| 2004/5 | 6 | 57 | 38 | 5.7 | 6 | *2,305* |
| 2005/6 | 5 | 55 | 40 | 5.8 | 6 | *2,340* |
| 2007 | 5 | 51 | 45 | 6.0 | 6 | *2,190* |
| 2008 | 4 | 53 | 43 | 6.0 | 6 | *2,227* |
| 2009 | 4 | 47 | 49 | 6.2 | 6 | *2,424* |
| 2010 | 4 | 39 | 57 | 6.5 | 7 | *2,261* |
| 2011 | 4 | 36 | 61 | 6.7 | 7 | *2,380* |
| **Social Sector** | | | | | | |
| 2003/4 | 2 | 43 | 56 | 6.5 | 7 | *868* |
| 2004/5 | 2 | 35 | 63 | 6.7 | 7 | *780* |
| 2005/6 | 1 | 32 | 67 | 6.9 | 7 | *806* |
| 2007 | 2 | 32 | 66 | 6.9 | 7 | *826* |
| 2008 | 1 | 32 | 67 | 7.0 | 7 | *779* |
| 2009 | 1 | 27 | 72 | 7.2 | 7 | *900* |
| 2010 | 1 | 27 | 73 | 7.3 | 8 | *812* |
| 2011 | 2 | 22 | 76 | 7.4 | 8 | *811* |

*Source: Continuous SHCS*

**Figure 5** Dwellings by NHER bands. 2002-2011 (%)




*Source: Continuous SHCS*

47. Table 14 shows the NHER bandings alongside mean and median NHER scores by household characteristics.

48. Private-rented dwellings are over three times as likely to have a 'poor' NHER rating than owner-occupied dwellings. Ten percent of dwellings in the private rented sector are rated 'poor' compared to 3% of owner-occupied (Table 14).

**Table 14** NHER band (Row %), mean and median values by household characteristics

| | NHER Band (Row %) | | | Confidence | | | *Sample* |
|---|---|---|---|---|---|---|---|
| | **Poor** | **Moderate** | **Good** | **Mean** | **Interval** | **Median** | *size* |
| **Tenure** | | | | | | | |
| Owner-occupier | 3 | 35 | 62 | 6.7 | +/- 0.1 | 7 | *2,041* |
| LA/other public | 2 | 23 | 75 | 7.3 | +/- 0.2 | 8 | *463* |
| HA/co-op | 2 | 22 | 76 | 7.6 | +/- 0.2 | 8 | *348* |
| Private-rented | 10 | 38 | 52 | 6.3 | +/- 0.3 | 7 | *339* |
| | | | | | | | |
| Private Sector | 4 | 36 | 61 | 6.7 | +/- 0.1 | 7 | *2,380* |
| Social Sector | 2 | 22 | 76 | 7.4 | +/- 0.1 | 8 | *811* |
| **Household Type** | | | | | | | |
| Single adult | 6 | 28 | 66 | 7.0 | +/- 0.2 | 8 | *445* |
| Small adult | 4 | 32 | 64 | 6.8 | +/- 0.2 | 7 | *509* |
| Single parent | 2 | 25 | 73 | 7.2 | +/- 0.3 | 8 | *151* |
| Small family | 2 | 28 | 70 | 7.0 | +/- 0.2 | 8 | *443* |
| Large family | 4 | 40 | 56 | 6.6 | +/- 0.3 | 7 | *217* |
| Large adult | 2 | 35 | 64 | 6.9 | +/- 0.2 | 7 | *336* |
| Older smaller | 2 | 37 | 61 | 6.7 | +/- 0.2 | 7 | *589* |
| Single pensioner | 4 | 31 | 65 | 6.9 | +/- 0.2 | 7 | *501* |
| **Weekly Income Band** | | | | | | | |
| < £100 p.w. | 7 | 36 | 57 | 6.5 | +/- 0.5 | 7 | *76* |
| £100 -199.99 | 6 | 28 | 66 | 6.8 | +/- 0.2 | 7 | *444* |
| £200 -299.99 | 3 | 29 | 68 | 7.0 | +/- 0.2 | 7 | *652* |
| £300 -399.99 | 3 | 32 | 65 | 6.9 | +/- 0.2 | 7 | *484* |
| £400 -499.99 | 2 | 33 | 65 | 7.0 | +/- 0.2 | 8 | *366* |
| £500 -699.99 | 3 | 32 | 65 | 6.9 | +/- 0.2 | 7 | *541* |
| £700+ | 2 | 37 | 61 | 6.6 | +/- 0.1 | 7 | *596* |
| **Council Tax Band** | | | | | | | |
| A | 3 | 28 | 69 | 7.1 | +/- 0.2 | 8 | *659* |
| B | 3 | 28 | 69 | 7.1 | +/- 0.1 | 8 | *789* |
| C | 2 | 36 | 62 | 6.8 | +/- 0.2 | 7 | *540* |
| D | 4 | 31 | 65 | 6.7 | +/- 0.2 | 7 | *372* |
| E | 3 | 30 | 67 | 6.8 | +/- 0.2 | 7 | *428* |
| F | 2 | 43 | 54 | 6.4 | +/- 0.2 | 7 | *224* |
| G | 3 | 46 | 51 | 6.2 | +/- 0.3 | 7 | *137* |
| H | * | * | * | 6.9 | +/- 1.2 | 8 | *12* |
| Unobtainable | 11 | 64 | 25 | 5.3 | +/- 0.8 | 5 | *30* |
| | | | | | | | |
| **All Scotland** | **3** | **32** | **65** | 6.9 | +/- 0.1 | 7 | ***3,191*** |

*Source: SHCS 2011*

49. Around three-quarters of Local Authority and Housing Association achieve a "good" NHER rating, compared with 62% of owner-occupied and 52% of private rented dwellings (Table 14).

50. Mean NHER ratings by tenure are also shown in Figure 6 for comparison. Housing association stock has the highest mean NHER score of 7.7, while private rented dwellings scores just 6.3 on average. The average NHER rating of single parent households is the highest of all household types at an NHER of 7.2 (Table 14).

51. The overall higher energy efficiency standard of social housing is likely attributable to the requirement for social landlords to meet the Scottish Housing Quality Standard by 2015, which includes an energy efficiency component (see section 5.1).

52. Single parent households are more likely than other household types to have a 'good' NHER rating, largely because they are also more likely to be in social housing.

53. Broadly, higher Council tax bands have lower NHER ratings – presumably because more expensive dwellings are generally larger and therefore less energy efficient (Table 14).

54. Table 15 shows NHER banding, mean and median scores by dwelling characteristics. Dwellings with a greater exposed surface area loose heat more quickly to the environment. As a result, detached and semi-detached houses generally have lower energy efficiency than terraced houses.

55. Flats, often shielded above and/or below by neighbouring dwellings, tend to have higher energy efficiency ratings still. Almost three quarters of tenements and other flats have 'good' energy ratings, whereas under a half of detached houses are rated 'good' (Table 15).

56. The mean NHER for detached houses is 5.9, compared to 7.4 for tenement and other flats. The median NHER scores are 6 and 8 respectively (Figure 6 and Table 15).

57. The newest dwellings are built to higher energy efficiency standards and tend to out-perform older buildings; 84% of dwellings built after 1982 have a 'good' energy efficiency rating compared to 40% of the pre-1919 occupied stock and around 65% of other age groups. Less than 1% of dwellings built after 1982 have 'poor' NHER ratings compared to 9% of those built before 1919 (Table 15). This trend is reflected in their mean NHER scores (Figure 6).

58. Less than 2% of the housing stock has no central heating. A further 4% have only partial central heating. Of those without central heating, around half (52%) have 'poor' NHER ratings, compared to just 2% of those with full central heating. Two thirds (67%) of those with full central heating have 'good' ratings. Over half (56%) of those with partial central heating have 'moderate' NHER scores and only 36% are rated 'good' (Table 15).

59. Seventy-one percent of dwellings in urban areas have a 'good' NHER rating compared with 32% of those in rural areas. Urban dwellings are also about five times less likely to be rated 'poor' than those in rural areas. The mean NHER score for dwellings in rural areas is 5.3 compared to 7.2 for those in urban areas. The median NHER scores are 5 and 8 respectively (Table 15).

60. Dwellings off the gas grid are seven times less likely to have a 'good' NHER rating and about eight times more likely to have a 'poor' NHER rating than those who are on the gas grid (see Table 15).

61. Rural dwellings are:

- more likely to be off the gas grid, and use less efficient fuels such as oil or solid fuels in their central heating
- more likely to be detached or semi-detached dwellings with a larger heat-loss surface area
- situated in areas with greater exposure to wind and colder temperatures.

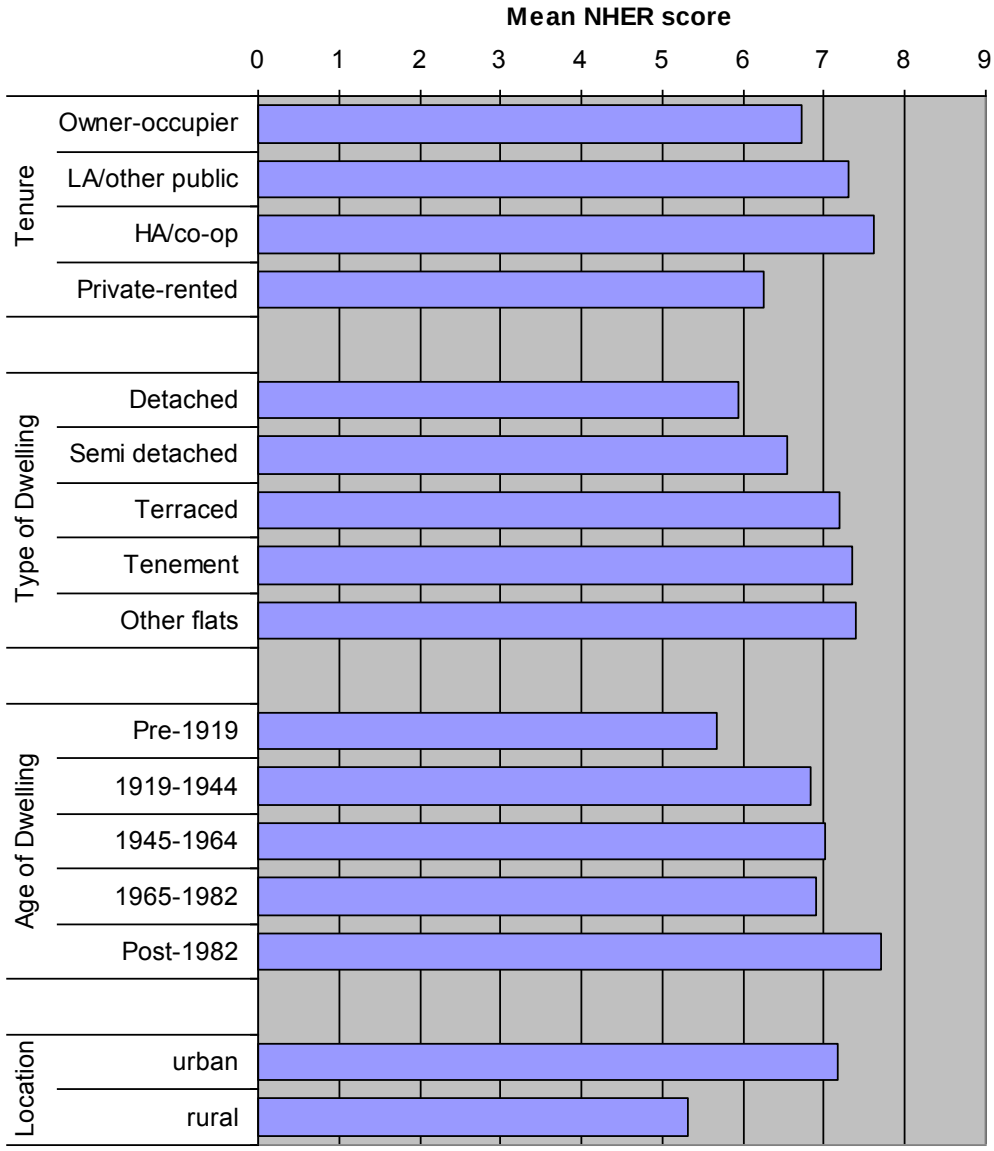
The combination of these factors results in much lower energy efficiencies.

**Table 15** NHER band (Row %), mean and median values by dwelling characteristics

| | NHER Band (Row %) | | | Confidence | | | *Sample* |
|---|---|---|---|---|---|---|---|
| | Poor | Moderate | Good | Mean | Interval | Median | *size* |
| **Type of Dwelling** | | | | | | | |
| Detached | 7 | 45 | 49 | 5.9 | +/- 0.1 | 6 | *792* |
| Semi detached | 2 | 40 | 58 | 6.6 | +/- 0.1 | 7 | *689* |
| Terraced | 1 | 27 | 72 | 7.2 | +/- 0.1 | 8 | *778* |
| Tenement | 4 | 23 | 74 | 7.4 | +/- 0.2 | 8 | *552* |
| Other flats | 2 | 24 | 74 | 7.4 | +/- 0.2 | 8 | *380* |
| **Age of Dwelling** | | | | | | | |
| Pre-1919 | 9 | 51 | 40 | 5.7 | +/- 0.2 | 6 | *581* |
| 1919-1944 | 3 | 33 | 65 | 6.8 | +/- 0.2 | 7 | *422* |
| 1945-1964 | 2 | 32 | 66 | 7.0 | +/- 0.1 | 7 | *745* |
| 1965-1982 | 3 | 32 | 65 | 6.9 | +/- 0.1 | 7 | *759* |
| Post-1982 | 1 | 15 | 84 | 7.7 | +/- 0.1 | 8 | *684* |
| **Extent of Central Heating** | | | | | | | |
| Full | 2 | 31 | 67 | 7.0 | +/- 0.1 | 7 | *3,032* |
| Partial | 8 | 56 | 36 | 5.6 | +/- 0.4 | 6 | *113* |
| No central heating | 52 | 45 | 3 | 2.8 | +/- 0.5 | 2 | *45* |
| **Primary Heating Fuel** | | | | | | | |
| Gas | 1 | 24 | 75 | 7.4 | +/- 0.1 | 8 | *2,337* |
| Oil | 8 | 85 | 7 | 4.6 | +/- 0.2 | 5 | *279* |
| Electric | 14 | 51 | 35 | 5.3 | +/- 0.2 | 5 | *486* |
| Other fuel type | 16 | 52 | 32 | 4.9 | +/- 0.4 | 5 | *88* |
| **Urban/Rural** | | | | | | | |
| Urban | 2 | 27 | 71 | 7.2 | +/- 0.1 | 8 | *2,485* |
| Rural | 11 | 57 | 32 | 5.3 | +/- 0.2 | 5 | *706* |
| **Gas Grid** | | | | | | | |
| Off Gas Grid | 16 | 75 | 10 | 4.4 | +/- 0.2 | 4 | *477* |
| On Gas Grid | 2 | 28 | 70 | 7.1 | +/- 0.1 | 8 | *2,711* |
| **All Scotland** | **3** | **32** | **65** | **6.9** | **+/- 0.1** | **7** | ***3,191*** |

*Source: SHCS 2011*

**Figure 6** Mean NHER by tenure, type of dwelling, age of dwelling and urban/rural indicator




*Source: SHCS 2011*

## 3.4 Standard Assessment Procedure (SAP)

62. The 2011 SHCS reports SAP 2005 only, SAP 2001 data will be available on request. SAP 2005 is for rating the energy efficiency of existing dwellings; it is scaled from 1 (poor) to 100 (excellent)[11].

63. SAP 2005 takes space and water heating plus lighting into account. SAP 2001 did not include lighting. As with all versions of SAP, regional or climatic conditions are not taken account of in the calculations.

[11] For more information on SAP 2001 and SAP 2005 see paragraphs 172-176.

64. Table 16 shows the SAP 2005 rating of occupied housing stock for 2011. The largest proportion (39%) of dwellings are rated from 61 to 70, with the median score being 66 and the mean 62.6. In 2011, 26% of dwellings had a rating over 70; a small increase on 2010 figures when 27% had a rating over 70. As in previous years no sampled dwellings had a score of 91-100.

**Table 16** Dwellings by banded SAP 2005 scores (000s and %)

| Banded SAP 2005 | 000s | % | *Unweighted sample size* |
|---|---|---|---|
| 1-10 | 7 | 0 | *10* |
| 11-20 | 10 | 0 | *15* |
| 21-30 | 39 | 2 | *62* |
| 31-40 | 81 | 3 | *131* |
| 41-50 | 200 | 8 | *300* |
| 51-60 | 473 | 20 | *687* |
| 61-70 | 913 | 39 | *1,229* |
| 71-80 | 610 | 26 | *739* |
| 81-90 | 17 | 1 | *18* |
| 91-100 | - | - | *0* |
| **Sub-total** | **2,349** | **99** | ***3,191*** |
| Unobtainable | 19 | 1 | ***28*** |
| **Total** | **2,368** | **100** | ***3,219*** |
| | | **95% CI** | |
| | | **lower** | **upper** |
| **Mean** | **62.6** | 62.1 | 63.0 |
| **Median** | **66** | | |

*Source: SHCS 2011*

65. SAP 2005 scores tend to follow the same pattern as NHER ratings when looking at dwelling and household characteristics.

66. Table 17 shows that flats have a higher mean SAP than houses, and post 1982 dwellings have a better SAP rating than all other dwelling age groups.

67. As with NHER, dwellings in the social sector have a better energy efficiency rating than those in the private sector.

68. Dwellings in rural areas have a mean SAP 2005 rating of 53.5 while for those in urban areas the mean is 64.3. The difference between urban and rural dwellings is more marked under the NHER (26% lower on average, compared with 17% lower under SAP). This is likely because NHER accounts for environmental factors such as local temperature, elevation and wind speed.

69. Dwellings on the gas grid have a higher mean SAP rating than those not on the gas grid. Under SAP 2005 the mean SAP for dwellings on the gas grid is 64.0 compared with 48.4 for those not on the gas grid.

**Table 17** Mean and median SAP 2005 scores by dwelling and household characteristics

| SAP 2005 | Mean | 95% Confidence Interval | | Median | *Unweighted sample size* |
|---|---|---|---|---|---|
| | | Lower bound | Upper bound | | |
| **Type of Dwelling** | | | | | |
| Detached | 56.6 | 55.7 | 57.6 | 60.0 | *801* |
| Semi detached | 61.0 | 60.3 | 61.8 | 63.0 | *691* |
| Terraced | 65.4 | 64.7 | 66.0 | 67.0 | *781* |
| Tenement | 65.2 | 64.2 | 66.3 | 69.0 | *557* |
| Other flats | 65.3 | 64.2 | 66.4 | 67.0 | *389* |
| **Age of Dwelling** | | | | | |
| Pre-1919 | 54.6 | 53.5 | 55.8 | 57.0 | *590* |
| 1919-1944 | 62.1 | 60.9 | 63.3 | 65.0 | *422* |
| 1945-1964 | 63.8 | 63.1 | 64.6 | 66.0 | *747* |
| 1965-1982 | 63.1 | 62.3 | 64.0 | 66.0 | *768* |
| Post-1982 | 68.0 | 67.3 | 68.6 | 69.0 | *692* |
| **Urban/Rural** | | | | | |
| Urban | 64.3 | 63.9 | 64.8 | 67.0 | *2,498* |
| Rural | 53.5 | 52.5 | 54.6 | 56.0 | *721* |
| **Gas Grid** | | | | | |
| On Gas Grid | 64.0 | 63.6 | 64.4 | 66.0 | *2,723* |
| Off Gas Grid | 48.4 | 47.2 | 49.6 | 50.0 | *493* |
| **Tenure** | | | | | |
| Owner-occupier | 61.7 | 61.2 | 62.2 | 64.0 | *2,054* |
| LA/other public | 66.2 | 65.3 | 67.0 | 68.0 | *464* |
| HA/co-op | 67.0 | 66.0 | 68.1 | 69.0 | *355* |
| Private-rented | 58.2 | 56.4 | 60.0 | 62.0 | *346* |
| | | | | | |
| Private Sector | 61.2 | 60.7 | 61.7 | 64.0 | *2,400* |
| Social Sector | 66.5 | 65.9 | 67.2 | 68.0 | *819* |
| | | | | | |
| **All Scotland** | **62.6** | **62.1** | **63.0** | **66.0** | ***3,219*** |

*Source: SHCS 2011*

## 3.5 Approximated Energy Performance Certificate Energy Efficiency Ratings

70. Energy Performance Certificates (EPCs) were introduced for existing buildings from December 2008 to promote improvements to the energy efficiency of buildings. Every dwelling built, sold or re-let must now have an EPC. As part of this initiative, dwellings are given an energy efficiency rating (EER) on a scale from 'A' to 'G', with 'A' being the most and 'G' being the least energy efficient.

71. SHCS data allows the EER element of domestic EPCs to be approximated based on 'RDSAP' (Reduced Data Standard Assessment Procedure)[12]. This section analyses approximated EER results. More information about EPCs can be found on the Scottish Government Building Standards website[13].

[12] See paragraph 177-181 for a description of the differences between SHCS and EPC measurements.
[13] http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/profinfo/epcintro

72. Table 18 provides a breakdown of SHCS EERs by a number of dwelling and household characteristics. In 2011, 43% of dwellings in Scotland have an EER of 'D', while no dwelling rated 'A' was found within the SHCS sample. Nine percent of detached houses have an EER of 'F' compared with 4% or less for each of the other dwelling types. Over 80% of dwellings on the gas grid have an EER of band D or better, while less than 40% not on the gas grid achieve similar ratings. Likewise, dwellings in urban areas are more likely to have a higher EER than those in rural areas.

**Table 18** Approximate EPC EERs by dwelling and household characteristics (%)

| | B | C | D | E | F | G | Unob-tainable | Total | *Sample size* |
|---|---|---|---|---|---|---|---|---|---|
| **Tenure** | | | | | | | | | |
| Private Sector | 1 | 32 | 43 | 18 | 5 | 1 | 1 | **100** | *2,400* |
| Social Sector | 1 | 48 | 41 | 8 | 1 | - | 1 | **100** | *819* |
| **Type of Dwelling** | | | | | | | | | |
| Detached | - | 19 | 45 | 25 | 9 | 1 | 1 | **100** | *801* |
| Semi detached | - | 25 | 54 | 18 | 3 | 1 | 0 | **100** | *691* |
| Terraced | - | 46 | 41 | 10 | 2 | 0 | 0 | **100** | *781* |
| Tenement | 3 | 47 | 34 | 11 | 4 | 0 | 1 | **100** | *557* |
| Other flats | 1 | 45 | 38 | 12 | 1 | 1 | 2 | **100** | *389* |
| **Age of Dwelling** | | | | | | | | | |
| Pre-1919 | - | 17 | 38 | 31 | 12 | 2 | 1 | **100** | *590* |
| 1919-1944 | - | 35 | 44 | 17 | 3 | 1 | - | **100** | *422* |
| 1945-1964 | 1 | 37 | 46 | 14 | 2 | 0 | 0 | **100** | *747* |
| 1965-1982 | 0 | 36 | 46 | 13 | 3 | 0 | 1 | **100** | *768* |
| Post-1982 | 2 | 52 | 38 | 5 | 1 | 0 | 1 | **100** | *692* |
| **Gas Grid** | | | | | | | | | |
| On Gas Grid | 1 | 39 | 43 | 13 | 3 | 0 | 0 | **100** | *2,723* |
| Not on Gas Grid | - | 3 | 34 | 40 | 16 | 4 | 4 | **100** | *493* |
| **Urban/Rural** | | | | | | | | | |
| Urban | 1 | 40 | 44 | 12 | 2 | 0 | 0 | **100** | *2,498* |
| Rural | - | 15 | 37 | 30 | 13 | 2 | 3 | **100** | *721* |
| **All Scotland %** | **1** | **36** | **43** | **15** | **4** | **1** | **1** | 100 | *3,219* |
| **Households (000s)** | **17** | **853** | **1,007** | **363** | **92** | **17** | **19** | **2,368** | *3,219* |

*Source: Continuous SHCS*

## 3.6 $CO_2$ Emissions

73. This section presents modelled CO2 emissions in the Scottish housing stock. They are derived from the modelled energy required to maintain a standard heating regime (in line with modelled energy consumption used for fuel poverty estimates) and are calculated using SAP 2005 emissions factors (see Table 19).

74. These values are therefore based only on the energy performance of the building fabric, appliances, and fuel source. They do not include information about the number or behaviour of occupants and are not calibrated against emissions inventories.

75. The National Atmospheric Emissions Inventory (NAEI) is the official source of CO2 emissions data and their *Greenhouse Gas Inventory*[14] is the source for checking statutory compliance with government targets.

[14] *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990 - 2010*, AEA http://uk-air.defra.gov.uk/reports/cat07/1208241153_DA_GHGI_report_2010_Issue1_r.pdf

**Table 19** SAP 2005 Emissions Factors

| SAP 2005 Emissions Factors (kgCO2/kWh) | |
|---|---|
| Gas (mains) | 0.194 |
| Electricity | 0.422 |
| Oil | 0.265 |
| LPG | 0.234 |
| House coal | 0.291 |
| Wood logs | 0.025 |

*Source: BRE 2011*[15]

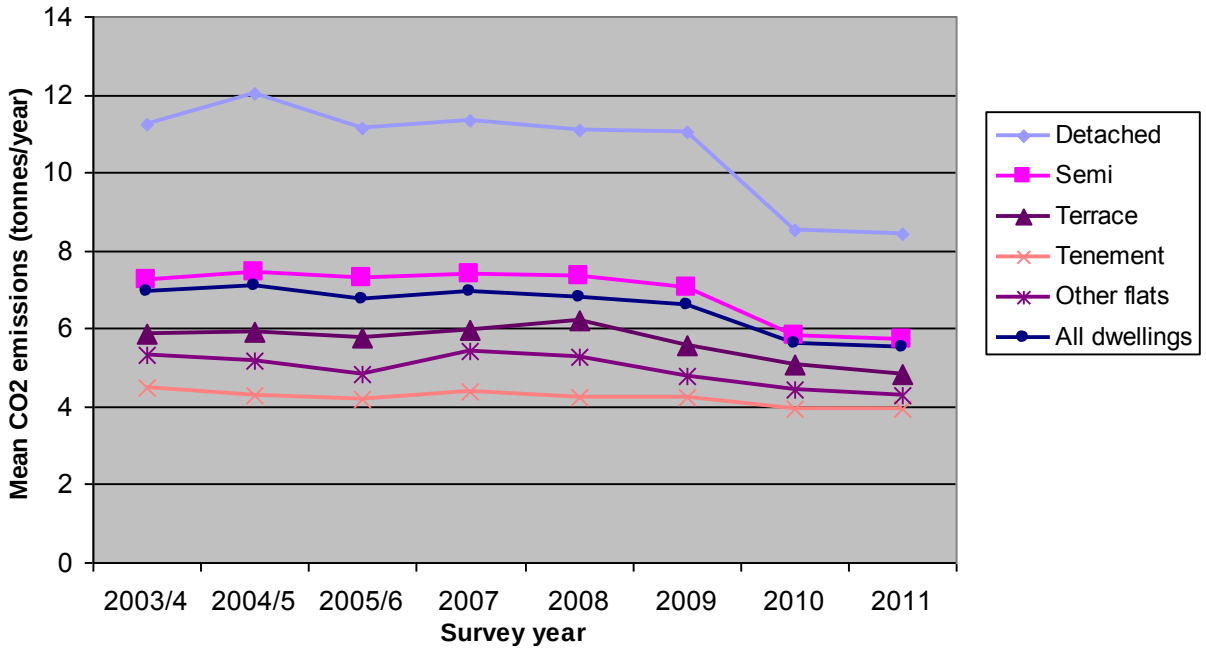
76. The SHCS estimates are used to compare emissions between years and different dwelling characteristics to show relative levels of carbon intensity.

**Table 20** Average CO2 emissions by Dwelling Type (tonnes per year) and Total CO2 Emissions (Million tonnes per year), 2003/4 to 2011

| | Survey Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Dwelling type** | **2003/4** | **2004/5** | **2005/06** | **2007** | **2008** | **2009** | **2010** | **2011** |
| Detached | 11.2 | 12.0 | 11.1 | 11.3 | 11.1 | 11.0 | 8.5 | 8.4 |
| Semi | 7.2 | 7.4 | 7.3 | 7.4 | 7.3 | 7.0 | 5.8 | 5.7 |
| Terrace | 5.9 | 5.9 | 5.8 | 5.9 | 6.2 | 5.6 | 5.1 | 4.8 |
| Tenement | 4.5 | 4.3 | 4.2 | 4.4 | 4.2 | 4.2 | 4.0 | 3.9 |
| Other flats | 5.3 | 5.2 | 4.8 | 5.4 | 5.3 | 4.8 | 4.4 | 4.3 |
| **All dwellings** | **6.9** | **7.1** | **6.8** | **6.9** | **6.8** | **6.6** | **5.6** | **5.5** |
| **Total CO2 emissions** | **15.8** | **16.3** | **15.7** | **16.1** | **15.9** | **15.5** | **13.1** | **13.0** |

*Source: Continuous SHCS*

**Figure 7** Average CO2 emissions by dwelling type (tonnes per year), 2003/4 to 2011



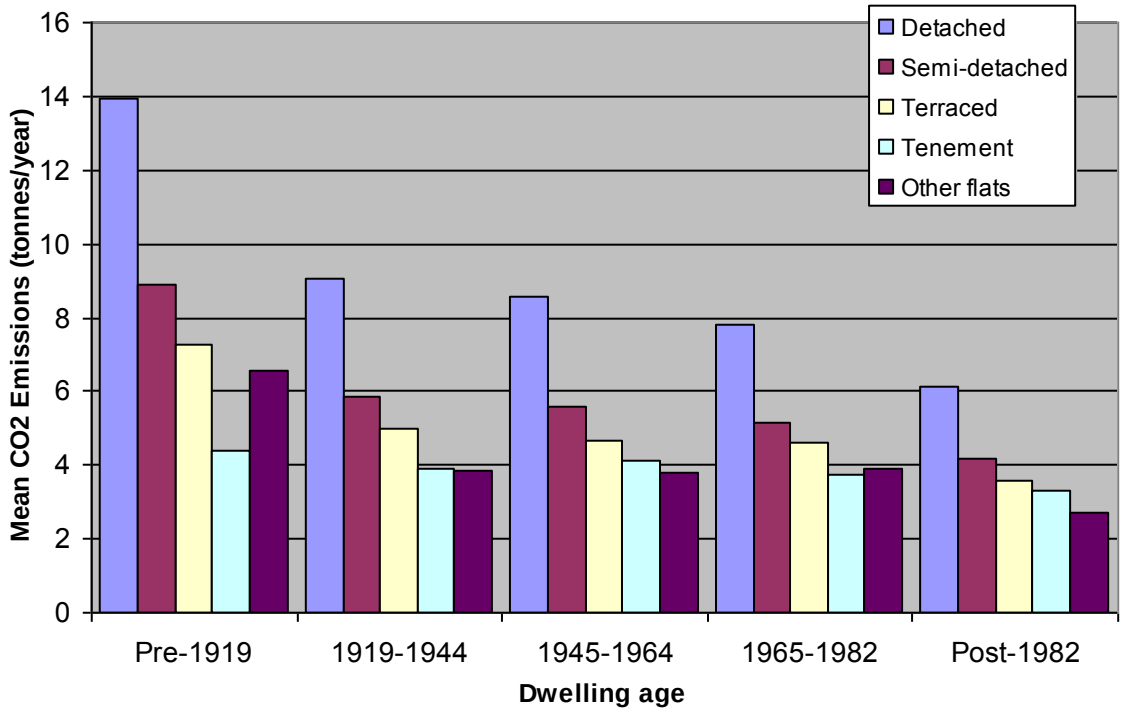

*Source: Continuous SHCS*

[15] *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, BRE http://www.bre.co.uk/filelibrary/SAP/2009/SAP-2009_9-90.pdf

77. The time series of SHCS modelled CO2 emissions from domestic buildings between 2003/04 and 2011 is shown in Table 20. As shown in Figure 7, since 2007 there has been a steady decrease in total modelled emissions.

78. Although a greater proportion of new dwellings are detached houses associated with higher emissions, Table 21 and Figure 8 show that newer housing of all types has lower CO2 emissions than older stock.

**Figure 8** Mean CO2 emissions by age and type of dwelling (Tonnes CO2 per year)




*Source: SHCS 2011*

**Table 21** Mean CO2 Emissions by Age and Type of dwelling (tonnes per year)

| | Type of dwelling | | | | | |
|---|---|---|---|---|---|---|
| **Age of dwelling** | *Detached* | *Semi-detached* | *Terraced* | *Tenement* | *Other flats* | **Total** |
| *Pre-1919* | 13.9 | 8.9 | 7.3 | 4.4 | 6.6 | 7.7 |
| *1919-1944* | 9.0 | 5.8 | 5.0 | 3.9 | 3.9 | 5.4 |
| *1945-1964* | 8.6 | 5.6 | 4.7 | 4.1 | 3.8 | 4.9 |
| *1965-1982* | 7.8 | 5.2 | 4.6 | 3.7 | 3.9 | 5.1 |
| *Post-1982* | 6.1 | 4.2 | 3.6 | 3.3 | 2.7 | 4.7 |
| **All dwellings** | **8.4** | **5.7** | **4.8** | **3.9** | **4.3** | **5.5** |

*Source: SHCS 2011*

79. As one of the lowest carbon intensity fuels under SAP 2005 (see Table 19), an inability to access the gas grid increases CO2 emissions. Gas heated dwellings are modelled to emit less than half the carbon of oil heated homes (Table 22).

80. In rural off-grid areas, high-emission fuels may be coupled with a greater degree of exposure leading to higher energy requirements and thus higher emissions.

81. There is not much difference between the CO2 emissions of using electricity or gas as a primary heating fuel and this gap will close as the grid is decarbonised.

**Table 22** Mean and Median CO2 emissions (tonnes per year) by heating, fuel and location characteristics

| Dwelling Characteristics | Mean | 95% CI lower | 95% CI upper | Median | Sample size |
|---|---|---|---|---|---|
| **Extent of Central Heating** | | | | | |
| Full | 5.5 | 5.4 | 5.6 | 4.5 | *3,032* |
| Partial | 6.2 | 5.5 | 6.9 | 5.2 | *113* |
| No central heating | 5.0 | 4.4 | 5.7 | 4.3 | *45* |
| **Primary Heating Fuel** | | | | | |
| Gas | 5.0 | 4.9 | 5.1 | 4.3 | *2,337* |
| Oil | 11.0 | 10.2 | 11.8 | 8.7 | *279* |
| Electric | 5.9 | 5.6 | 6.2 | 5.0 | *486* |
| Other fuel type | 6.6 | 5.6 | 7.5 | 4.3 | *88* |
| **Urban/Rural** | | | | | |
| Urban | 5.0 | 4.8 | 5.1 | 4.3 | *2,485* |
| Rural | 8.4 | 8.0 | 8.8 | 7.0 | *706* |
| **Gas Grid** | | | | | |
| On Gas Grid | 5.1 | 5.0 | 5.2 | 4.4 | *2,711* |
| Off Gas Grid | 9.7 | 9.2 | 10.2 | 8.1 | *477* |
| **All Scotland** | **5.5** | **5.4** | **5.7** | **4.6** | ***3,191*** |

*Source: SHCS 2011*

# 4 Fuel Poverty

82. The term 'Fuel Poverty' refers to the situation where a household cannot afford to heat their home to an adequate level. The Scottish Government uses the following definition of fuel poverty as set out in the Scottish Fuel Poverty Statement (FPS)[16] published in 2002:

    *"A household is in fuel poverty if it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use."*

    The Scottish Government have pledged to ensure that by November 2016, so far as is reasonably practicable, people are not living in fuel poverty in Scotland.

83. Furthermore 'Extreme Fuel Poverty' is defined as a household having to spend more than 20% of its income on fuel.

84. Fuel poverty statistics are based on a model that calculates the cost of heating a dwelling according to a specified temperature regime and mid-year fuel prices. For a more detailed description of the definition of fuel poverty and analysis of previous years' SHCS fuel poverty statistics see the Fuel Poverty Statement, the SHCS 2002 Fuel Poverty in Scotland Report[17] and the SHCS Fuel Poverty Report 2003/4[18]. A technical note on the calculation of Fuel Poverty figures using SHCS data can be found on the SHCS website[19].

85. An extensive review of the evidence on fuel poverty based on the SHCS data to 2010 is available from the Scottish Government website[20]. In it we provide further analysis of the factors driving fuel poverty, a detailed profile of the fuel poor, and examine alternative definitions mooted by the Hills Review of Fuel Poverty[21].

86. In each of the eight continuous survey years there were a number of cases where it was not possible to determine fuel poverty status. These have been apportioned on a pro-rata basis between the two categories (or three categories in the case of extreme fuel poverty) as was discussed in the 2004/5 SHCS Key Findings Report[22]. 73 'missing' cases were reapportioned in 2011. Households with negative annual household income after council tax deduction are removed from the fuel poverty calculations but reapportioned in this way.

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[16] http://www.scotland.gov.uk/Publications/2002/08/15258/9951
[17] Available to download at http://www.scotland.gov.uk/Topics/Statistics/SHCS/FuelPoverty
[18] Web only publication available at: http://www.scotland.gov.uk/Publications/2006/11/23092121/0
[19] Technical note available at : http://www.scotland.gov.uk/Topics/Statistics/SHCS/technicalnotefuelpoverty
[20] *Fuel Poverty Evidence Review - Defining, Measuring and Analysing Fuel Poverty in Scotland* http://www.scotland.gov.uk/Topics/Statistics/SHCS/FPEvidenceReview
[21] Hills Review Interim report (October 2011) - http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/funding-support/fuel-poverty/3226-fuel-poverty-review-interim-report.pdf
Hills Review Final report (March 2012) - http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/funding-support/fuel-poverty/4662-getting-measure-fuel-pov-final-hills-rpt.pdf
[22] http://www.scotland.gov.uk/Publications/2007/03/26155927/0 paragraph 32.

## 4.1 Trends and Drivers

87. Figure 9 and Table 23 show fuel poverty rates from 2002. The number of fuel poor households and the fuel poverty rate include those in extreme fuel poverty.

88. Latest figures for 2011 are shown with respect to two sets of fuel prices: mid-year July 2011, in line with previous annual statistics and for October 2011, showing the effects of large fuel price rises in the autumn of 2011. For more information see page 27.

89. From 2002 levels (293,000 or 13%) fuel poverty increased to a peak in 2009 (770,000 or 33%). Rates then decreased for 2 years between 2009 and July 2011, to a level of 582,000 households (25%). Following the sharp fuel price increases in autumn 2011, fuel poverty increased to 684,000 (29%) in October 2011.

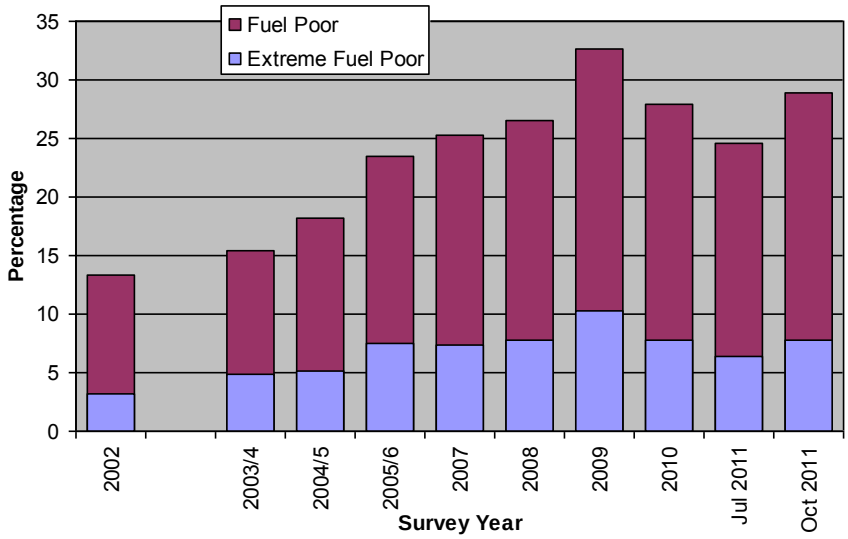
90. Trends in the number and percentage of households in extreme fuel poverty follow a very similar pattern, with the latest estimate of 185,000 (8%) in October 2011.

**Table 23** Fuel poverty and extreme fuel poverty 1996-2011 (000s and %)

| | Fuel poverty | | Extreme fuel poverty | |
|---|---|---|---|---|
| Year | *000's* | *%* | *000's* | *%* |
| 2002 | 293 | 13.4 | 71 | 3.2 |
| 2003/4 | 350 | 15.4 | 112 | 4.9 |
| 2004/5 | 419 | 18.2 | 119 | 5.2 |
| 2005/6 | 543 | 23.5 | 173 | 7.5 |
| 2007 | 586 | 25.3 | 172 | 7.4 |
| 2008 | 618 | 26.5 | 182 | 7.8 |
| 2009 | 770 | 32.7 | 243 | 10.3 |
| 2010 | 658 | 27.9 | 185 | 7.8 |
| 2011 (July Price) | 582 | 24.6 | 153 | 6.4 |
| 2011 (Oct Price) | 684 | 28.9 | 185 | 7.8 |

*Source: SHCS 1996, 2002 and Continuous SHCS 2003/4 - 2011*

**Figure 9** Households in fuel poverty 1996-2011 (%)




*Source: SHCS 1996, 2002 and Continuous SHCS*

91. The 3 main factors driving changes fuel poverty rates are fuel prices, income and energy efficiency of the home[23].

### 4.1.1 Fuel Prices

92. Table 24 shows the change in the 3 main fuel prices between May 1996 and July 2012 against changes in fuel poverty. This table includes an average fuel price figure weighted by the proportion of households using each of those fuels for their home heating as recorded by the SHCS.

93. Since 2003/4, fuel poverty rates have been estimated based on mid-year fuel prices. Due to a steep fuel price rise in autumn 2011 we have included additional estimates at this higher rate. Figure 10 shows how fuel prices moved on a quarterly basis since 2003.[24]

**Table 24** Retail Price Index fuel components, May 1996 to June 2012

| Fuel price index numbers relative to the GDP deflator | | | | | |
|---|---|---|---|---|---|
| **Year** | **% Fuel poor** | **Gas** | **Electricity** | **Heating oils** | **Weighted average** |
| **2002** | 13.4 | 86.0 | 91.1 | 67.1 | 83.3 |
| **2004** | 15.4 | 88.4 | 91.9 | 79.4 | 85.9 |
| **2005** | 18.2 | 97.3 | 98.4 | 91.0 | 94.4 |
| **2006** | 23.5 | 126.5 | 117.7 | 115.1 | 121.1 |
| **2007** | 25.3 | 130.2 | 122.9 | 107.8 | 127.2 |
| **2008** | 26.5 | 142.9 | 134.5 | 187.5 | 145.3 |
| **2009** | 32.7 | 173.8 | 141.4 | 107.0 | 162.7 |
| **2010** | 27.9 | 158.9 | 137.0 | 137.1 | 153.9 |
| **July 2011** | 24.6 | 164.5 | 139.0 | 171.8 | 161.5 |
| **Oct 2011** | 28.9 | 191.0 | 152.1 | 168.8 | 183.5 |
| **2012** | | 186.0 | 146.7 | 159.7 | 178.1 |

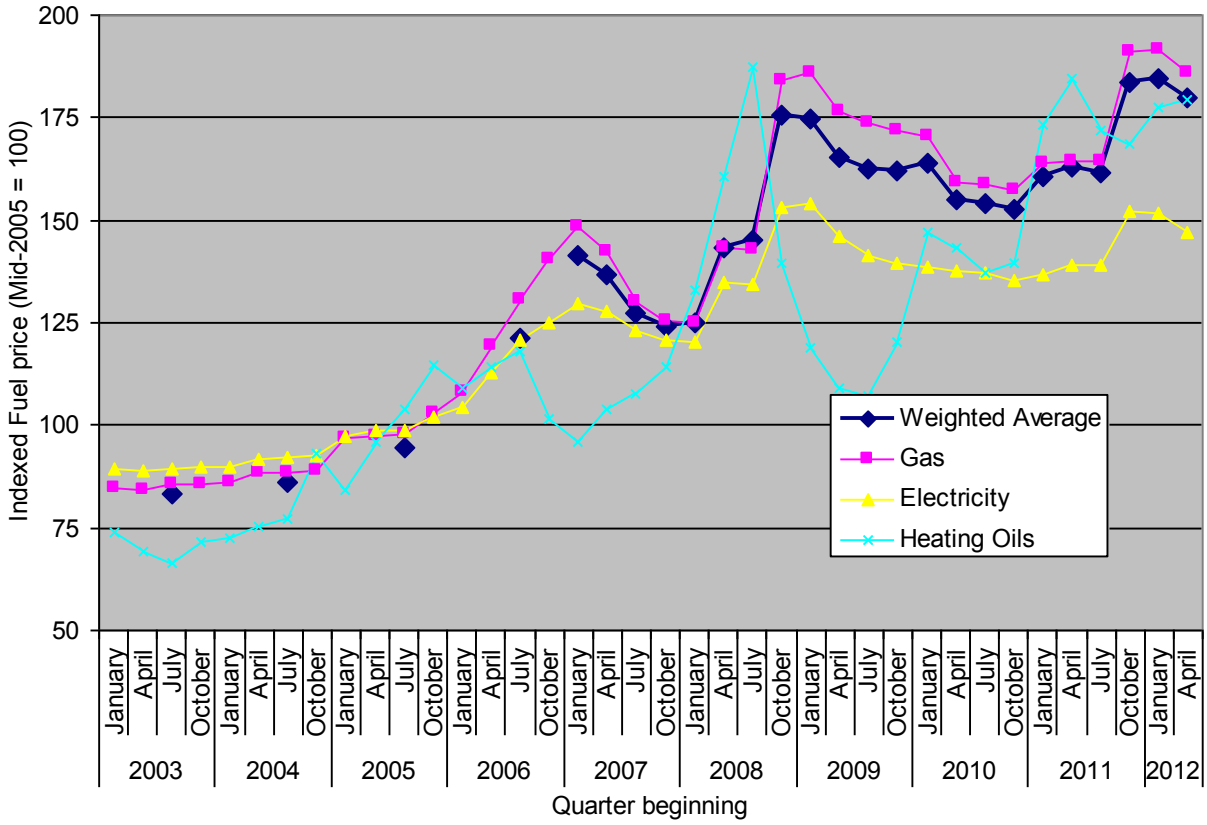
*Source: Continuous SHCS; DECC RPI Fuel Components*[25]

[23] The exact rise in overall fuel costs depends on the proportion of each of the fuels used by a household and the relevant charges for each supplier. Swings in prices will affect rural and urban areas differently.

[24] The average fuel price figure included in table 24 and figure 10 is weighted by the proportion of households using each of those fuels for primary heating as recorded in the SHCS.

[25] Source: Quarterly Energy Prices. Figures indexed to 100 in mid 2005. Tables available at:
2.1.3 Retail prices index: fuel components, monthly figures
http://www.decc.gov.uk/en/content/cms/statistics/source/prices/prices.aspx

**Figure 10** RPI fuel price components from 2003 relative to the GDP deflator




*Source: DECC RPI Fuel Components, Continuous SHCS*

94. These figures show that, in general, between 2002 and 2009 fuel prices and fuel poverty rose in parallel. Between 2009 and 2010 fuel prices for all fuels except heating oils dipped, which is reflected in a fall in fuel poverty rates.

95. In July 2011, although the fuel price index swung back towards 2009 levels, there was no equivalent rise in fuel poverty. Until early autumn this was partly due to the disproportionate burden borne by users of other fuels, who saw a 34 point increase, compared to gas and electricity users (6 and 2 point increases respectively).

96. The autumn 2011 price rises were more widely distributed and include a 27 point increase in the cost of gas from July; a far more commonly used fuel. As a result, fuel poverty rates increased in October 2011.

### 4.1.2 Income and Energy Efficiency

97. Trends in fuel price and fuel poverty levels are shown alongside corresponding changes in income and energy efficiency in Figure 11[26].

[26] Indexed values for fuel price and median income are relative to 100 in mid-2005

98. The SHCS samples drawn in 2010 and 2011 show an increase in average household income over this period, with the mean annual household income increasing from £23,000 to £24,500 and the median growing from £18,100 to £19,600[27]. This increase is seen right across the income distribution. The estimated level of fuel poverty is primarily affected by changes in the bottom half of the distribution.

99. It is important to recognise some limitations to the income information collected in the SHCS. It covers net income from all sources for the highest income householder and his or her partner. It will therefore underestimate total income in households where more than 2 adults receive income from some source. This affects disproportionately the upper half of the distribution.[28] The data collection methods and design of the survey are not geared to the production of the most robust estimates of household income change and because of incomplete income information some imputation of income components is usually undertaken[29].

100. The examination of measures of central tendency shows that for the last decade the SHCS median has tracked well data from the Family Resources Survey (FRS), the official source for household income information, except for the period 2007 – 2009 where it showed slight reductions compared to the increase that would be expected in line with FRS trends.

**Table 25** Change in mean annual income by income decile group, 2010-2011

| Income Decile Group | Year 2010 | 2011 | Percentage Change |
|---|---|---|---|
| *1* | 5,400 | 6,100 | 13% |
| *2* | 9,300 | 9,900 | 6% |
| *3* | 11,900 | 12,500 | 4% |
| *4* | 14,400 | 15,000 | 4% |
| *5* | 16,800 | 18,100 | 8% |
| *6* | 20,000 | 21,600 | 8% |
| *7* | 24,600 | 26,100 | 6% |
| *8* | 30,900 | 32,100 | 4% |
| *9* | 39,400 | 40,400 | 2% |
| *10* | 60,900 | 63,000 | 4% |
| ***All*** | 23,300 | 24,500 | 5% |

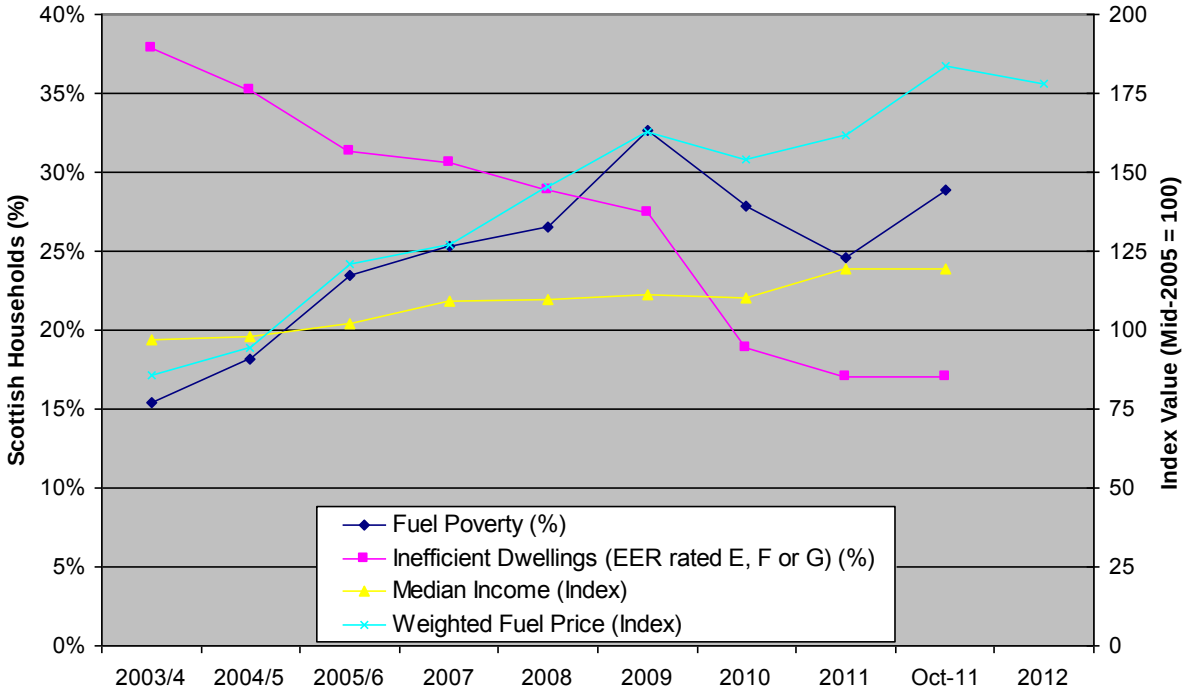
*Source: Continuous SHCS*

101. As shown in Chapter 3, and alongside other fuel poverty drivers in Figure 11, we have seen continuing improvement in energy efficiency upgrades of the housing stock.

[27] Figures reported here do not take account of cost of living increases.
[28] For an assessment of SHCS income data in relation to the FRS/HBAI see Raab, G et.al. 2004 'Comparison of Income Data between Surveys of Scottish Households' available at http://www.scotland.gov.uk/Topics/Statistics/16002/SHSIncPaper

[29] For more detail on the income data collection and imputation see Scottish Housing Condition Survey: Technical Report 2011 which accompanies this publication.

**Figure 11** Fuel Poverty by energy efficiency and indexed fuel price and median income




*Source: Continuous SHCS; DECC RPI Fuel Components*

102. To understand the contribution of household income and the improvement of the energy efficiency of the housing stock we attempted to simulate the changes experienced between 2010 and 2011 separately for each set of factors and examined the resulting changes in the estimated level of fuel poverty. We used data from the 2010 and 2011 SHCS and, because each of those represents a fresh sample from the dwellings population of Scotland, our estimates will contain noise arising from sampling variation and should only be seen as an approximation for this particular combination of prices, energy efficiency and income levels. Annex A describes the methodology and results from this exercise, which are also illustrated in Figure 12.

103. There was a reduction in the estimated level of fuel poverty of 76,000 or 3.4% of households between 2010 and July 2011. The conclusion from our simulation is that:

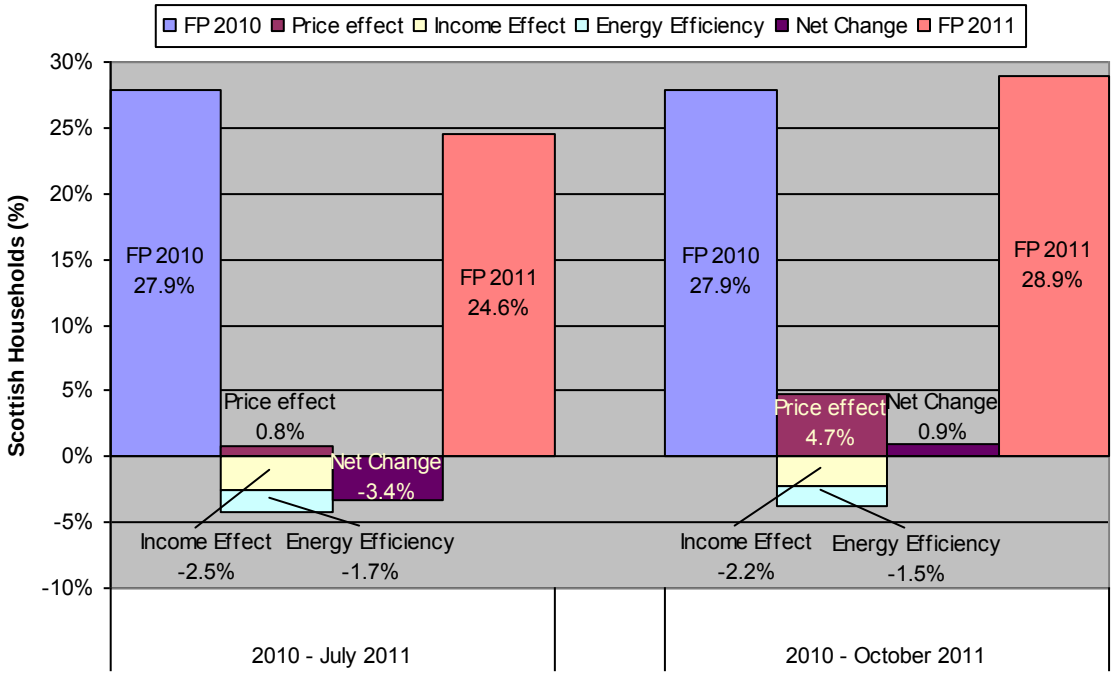
- an increase in average household income contributed a 2.5 percentage points decrease in fuel poverty rates;
- improvements in the energy efficiency of housing contributed a 1.7 percentage points decrease in fuel poverty rates, and
- increases in fuel prices contributed a 0.8 percentage points increase in fuel poverty rates.

104. The corresponding analysis between 2010 and October 2011, when there was an increase in the estimated level of fuel poverty of 26,000 or 1% of households showed:

- income growth contributed a 2.2 percentage points decrease in fuel poverty rates;
- energy efficiency improvements contributed a 1.5 percentage points decrease in fuel poverty rates; and
- increases in fuel prices led to a 4.7 percentage points increase in fuel poverty rates.

105. Overall, our simulation found that for the period between 2010 and 2011 the growth in household income and the improvements in energy efficiency effectively contained the growth of fuel poverty against price increases up until the early autumn of 2011 when there was a step change in the price of fuel. Only about 80 per cent of the latest price increase could be offset by income growth and housing stock improvements, and the rate of fuel poverty went up. Around 60 percent of the offsetting effect was due to household income and around 40 percent can be attributed to changes in the housing stock, at least some of which will constitute energy efficiency upgrades.

**Figure 12** Price, income and energy efficiency effects on fuel poverty rate




*Source: SHCS 2010, SHCS 2011*

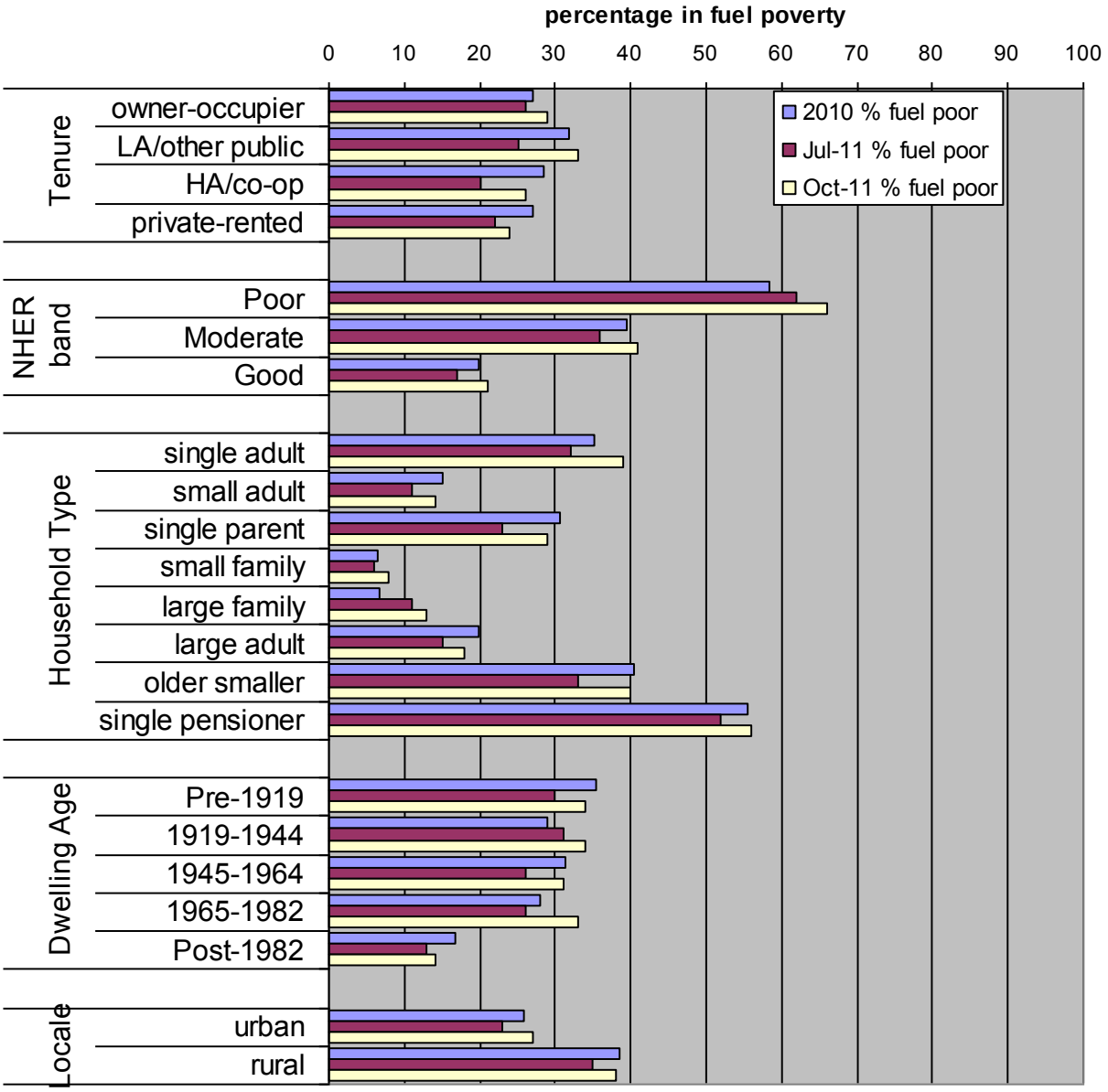
## 4.2 Fuel Poverty, Dwelling and Household Attributes

106. The relative distribution of fuel poverty in 2011 remained very similar to previous years. The reduction in the prevalence of fuel poverty to July 2011 benefitted disproportionately lower income groups: those with weekly incomes below £300 and residents of social housing. These gains were reversed in the autumn and by October 2011 levels had returned close to those experienced in 2010. Groups who seem to have done consistently badly throughout 2011 include households living in higher council tax band properties (Bands F & G), those in dwellings rated 'poor' on the NHER scale and large families (although from a very low base). (Table 26 to Table 29)

107. Detached properties remain the most likely to suffer fuel poverty (157,000 or 33% by October prices). However, whereas in 2010 tenement flats and terraced houses had similar levels of fuel poverty (25%), the latter did not benefit from the reductions to July 2011 (tenements dropped 4 points) and both suffered from the subsequent rise to October. This put 30% of terraced dwelling occupants (141,000) into fuel poverty (Table 26 & Table 27).

108. Inter-war dwellings did not see a reduction in July 2011 but suffered a 5 point increase from 2010 to October 2011. This means that buildings from 1919-1944 are just as likely to be fuel poor as pre-1919 dwellings at 34% (153,000 pre-1919 and 106,000 from 1919-1944) (Table 26 & Table 27).

**Figure 13** Fuel poverty rates by selected household and dwelling characteristics (%), 2010 and July and October fuel prices 2011.




*Source: SHCS 2010-11*

109. Pre-1919 dwellings are still more likely to be in extreme fuel poverty. In October 2011, almost twice as many were extreme fuel poor as for 1919-1944 constructions (52,000 or 12% compared with 27,000 or 9%).

110. This change, alongside a rise in fuel poverty in dwellings built between 1965 and 1982, means that the age dependency seen in previous year breaks down somewhat, with the exception of post-1982 dwelling which continue to perform well. This is likely a result of higher building standards in new buildings which require a minimum energy efficiency (Table 26,Table 27 and Figure 13).

111. Across-the-board price rises to October 2011 meant that changes in fuel poverty were relatively evenly spread. Oil users remain most likely to be fuel poor (50%) and gas-users least (26%) (Table 27).

112. As we might expect, dwellings with lower energy efficiency were more likely to be fuel poor. Households with a poor NHER rating increased in fuel poverty when there was a general downwards trend between 2010 and July 2011. This increase continued through October 2011, resulting in a 8 percentage point increase overall to 48,000 or 66% of households (Table 26, Table 27 and Figure 13).

**Table 26** Fuel Poverty by dwelling characteristics (000s)

| | July 2011 Prices | | | October 2011 Prices | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Not Fuel Poor* | *Fuel Poor* | *Extreme Fuel Poor* | *Not Fuel Poor* | *Fuel Poor* | *Extreme Fuel Poor* | **Total** | ***Sample size*** |
| **Type of Dwelling** | | | | | | | | |
| Detached | 350 | 157 | 67 | 340 | 166 | 73 | 506 | *779* |
| Semi detached | 376 | 117 | 22 | 350 | 143 | 29 | 493 | *687* |
| Terraced | 419 | 141 | 31 | 391 | 169 | 39 | 560 | *772* |
| Tenement | 407 | 106 | 18 | 386 | 127 | 26 | 512 | *530* |
| Other flats | 235 | 62 | 15 | 218 | 79 | 19 | 297 | *378* |
| **Age of Dwelling** | | | | | | | | |
| Pre-1919 | 313 | 135 | 44 | 295 | 153 | 52 | 448 | *564* |
| 1919-1944 | 214 | 94 | 22 | 202 | 106 | 27 | 308 | *420* |
| 1945-1964 | 393 | 138 | 34 | 363 | 167 | 42 | 530 | *740* |
| 1965-1982 | 420 | 150 | 34 | 385 | 186 | 43 | 571 | *754* |
| Post-1982 | 446 | 65 | 19 | 439 | 71 | 20 | 511 | *668* |
| **Extent of Central Heating** | | | | | | | | |
| Full | 1,714 | 538 | 138 | 1617 | 635 | 168 | 2,252 | *2,995* |
| Partial | 57 | 24 | 7 | 54 | 27 | 8 | 82 | *110* |
| None | 15 | 20 | 8 | 13 | 21 | 9 | 34 | *40* |
| **Primary Heating Fuel** | | | | | | | | |
| Gas | 1,461 | 397 | 89 | 1383 | 476 | 108 | 1,858 | *2,311* |
| Oil | 76 | 64 | 25 | 70 | 70 | 29 | 140 | *276* |
| Electric | 215 | 102 | 33 | 195 | 122 | 44 | 317 | *470* |
| Other | 33 | 19 | 6 | 36 | 16 | 4 | 52 | *88* |
| **NHER Band** | | | | | | | | |
| Poor | 28 | 45 | 22 | 25 | 48 | 27 | 73 | *134* |
| Moderate | 484 | 273 | 93 | 448 | 309 | 106 | 757 | *1,095* |
| Good | 1,274 | 263 | 39 | 1211 | 327 | 52 | 1,537 | *1,917* |
| **Urban/rural** | | | | | | | | |
| Urban | 1,530 | 446 | 107 | 1441 | 536 | 131 | 1,977 | *2,451* |
| Rural | 256 | 136 | 46 | 244 | 147 | 54 | 391 | *695* |
| **Mains Gas Grid** | | | | | | | | |
| Not on gas grid | 126 | 85 | 32 | 120 | 91 | 37 | 211 | *470* |
| On gas grid | 1,658 | 496 | 120 | 1562 | 592 | 148 | 2,154 | *2,673* |
| **All Scotland** | 1,786 | 582 | 153 | 1050 | 684 | 129 | 2,368 | ***3,146*** |

*Source: SHCS 2011*

**Table 27** Fuel poverty rate by dwelling characteristics (Row %)

| | 2010 | Jul-11 | Oct-11 | *2011 Sample* |
|---|---|---|---|---|
| **Type of Dwelling** | | | | |
| Detached | 34 | 31 | 33 | *779* |
| Semi detached | 28 | 24 | 29 | *687* |
| Terraced | 25 | 25 | 30 | *772* |
| Tenement | 25 | 21 | 25 | *530* |
| Other flats | 28 | 21 | 27 | *378* |
| **Age of Dwelling** | | | | |
| Pre-1919 | 35 | 30 | 34 | *564* |
| 1919-1944 | 29 | 31 | 34 | *420* |
| 1945-1964 | 31 | 26 | 31 | *740* |
| 1965-1982 | 28 | 26 | 33 | *754* |
| Post-1982 | 17 | 13 | 14 | *668* |
| **Extent of Central Heating** | | | | |
| Full | 28 | 24 | 28 | *2,995* |
| Partial | 36 | 30 | 33 | *110* |
| None | 33 | 57 | 62 | *40* |
| **Primary Heating Fuel** | | | | |
| Gas | 25 | 21 | 26 | *2,311* |
| Oil | 45 | 45 | 50 | *276* |
| Electric | 37 | 32 | 38 | *470* |
| Other | 38 | 36 | 30 | *88* |
| **NHER Band** | | | | |
| Poor | 58 | 62 | 66 | *134* |
| Moderate | 40 | 36 | 41 | *1,095* |
| Good | 20 | 17 | 21 | *1,917* |
| **Urban/rural** | | | | |
| Urban | 26 | 23 | 27 | *2,451* |
| Rural | 38 | 35 | 38 | *695* |
| **Mains Gas Grid** | | | | |
| Not on gas grid | 45 | 40 | 43 | *470* |
| On gas grid | 26 | 23 | 27 | *2,673* |
| **All Scotland** | 28 | 26 | 29 | *3,146* |

*Source: SHCS 2011*

113. By tenure, fuel price rises in October 2011 had the smallest effect on Housing Association and private-rented households compared with 2010 levels. Both saw a three percentage point decrease in fuel poverty from 2010 to 26% for Housing Associations and 24% for private rented (Table 29). Local Authority households remain the most likely to be fuel poor at 33% followed by owner-occupied dwellings at 29%.

114. While most household types saw a fuel poverty reduction to June 2011, large families gained four percentage points on 2010 levels (7% to 11%), reaching 13% in October 2011 (21,000 households).

115. Pensioners households and single adults remain the most vulnerable to fuel poverty. 56% of single pensioners were fuel poor in October 2011, 40% of older smaller households and 39% of single adult households. Pensioner households accounted for 55% of the fuel poor in total (377,000) (Table 28 and Table 29).

116. After a 3 percentage point drop to July 2011, single adult fuel poverty rose again by 7 points to 39% in October 2011 (132,000 households).

117. As expected, there remains a clear correlation between income and fuel poverty. Fuel poverty reductions to July 2011 favoured the lower income groups, however those earning less than £100 per week are modelled to spend such a high proportion of their income on fuel that there was no significant effect. Those earning £100 to £200 and £200 to £300 per week saw a 2 and 6 percentage point reduction respectively, however the October 2011 fuel price increases hit them hardest (7 and 10 point increase), negating any advantage and leading to a net increase (Table 29).

**Table 28** Fuel Poverty by household characteristics (000s)

| | July 2011 Prices | | | October 2011 Prices | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Not Fuel Poor* | *Fuel Poor* | *Extreme Fuel Poor* | *Not Fuel Poor* | *Fuel Poor* | *Extreme Fuel Poor* | **Total** | ***Sample size*** |
| **Tenure** | | | | | | | | |
| Owner-occupier | 1,101 | 381 | 113 | 1050 | 433 | 129 | 1,483 | *2,022* |
| LA/other public | 263 | 89 | 17 | 236 | 115 | 23 | 352 | *461* |
| HA/co-op | 217 | 55 | 6 | 201 | 71 | 12 | 272 | *346* |
| Private-rented | 204 | 57 | 16 | 198 | 63 | 20 | 261 | *317* |
| | | | | | | | | |
| Private Sector | 1,306 | 438 | 129 | 1247 | 497 | 150 | 1,744 | *2,339* |
| Social Sector | 481 | 144 | 23 | 437 | 187 | 35 | 624 | *807* |
| **Household Type** | | | | | | | | |
| Single adult | 232 | 109 | 31 | 209 | 132 | 37 | 341 | *429* |
| Small adult | 349 | 42 | 9 | 338 | 53 | 12 | 391 | *495* |
| Single parent | 86 | 26 | 4 | 79 | 33 | 4 | 112 | *151* |
| Small family | 319 | 22 | 4 | 315 | 26 | 6 | 341 | *440* |
| Large family | 143 | 17 | 6 | 139 | 21 | 9 | 160 | *217* |
| Large adult | 198 | 34 | 9 | 190 | 42 | 11 | 232 | *328* |
| Older smaller | 283 | 140 | 34 | 254 | 169 | 39 | 423 | *587* |
| Single pensioner | 177 | 192 | 55 | 161 | 208 | 67 | 369 | *499* |
| **Weekly Income Band** | | | | | | | | |
| < £100 p.w. | 1 | 51 | 38 | - | 52 | 42 | 52 | *65* |
| £100 -199.99 p.w. | 65 | 268 | 76 | 41 | 291 | 96 | 333 | *444* |
| £200 -299.99 p.w. | 333 | 159 | 28 | 285 | 207 | 30 | 492 | *652* |
| £300 -399.99 p.w. | 318 | 55 | 8 | 304 | 70 | 11 | 373 | *483* |
| £400 -499.99 p.w. | 253 | 21 | 1 | 246 | 28 | 4 | 274 | *366* |
| £500 -699.99 p.w. | 369 | 19 | 2 | 366 | 22 | 3 | 388 | *541* |
| £700+ | 447 | 9 | - | 443 | 14 | - | 457 | *595* |
| **Council Tax Band** | | | | | | | | |
| A | 347 | 136 | 29 | 318 | 165 | 33 | 482 | *653* |
| B | 447 | 151 | 28 | 418 | 180 | 41 | 598 | *783* |
| C | 296 | 80 | 23 | 278 | 98 | 26 | 376 | *531* |
| D | 227 | 57 | 14 | 219 | 65 | 18 | 284 | *368* |
| E | 250 | 69 | 23 | 241 | 77 | 27 | 319 | *419* |
| F | 123 | 44 | 14 | 118 | 50 | 16 | 167 | *218* |
| G | 80 | 36 | 17 | 76 | 40 | 18 | 116 | *135* |
| H | - | - | - | - | - | - | 8 | *11* |
| Unobtainable | - | - | - | - | - | - | 19 | *28* |
| | | | | | | | | |
| **All Scotland** | 1,786 | 582 | 153 | 1684 | 684 | 185 | 2,368 | ***3,146*** |

*Source: SHCS 2011*

118. While council tax band remains a poor indicator of fuel poverty, F- and G-band dwellings saw consistent increases in fuel poverty between 2010 and July 2011 while others improved. By October 2011 these groups had gained 7 percentage points in fuel poverty since 2010 (from 71,000 in 2010 to 90,000 in October 2011).

**Table 29** Fuel poverty by households characteristics (Row %)

| | 2010 | Jul-11 | Oct-11 | *2011 Sample* |
|---|---|---|---|---|
| **Tenure** | | | | |
| Owner-occupier | 27 | 26 | 29 | *2,022* |
| LA/other public | 32 | 25 | 33 | *461* |
| HA/co-op | 29 | 20 | 26 | *346* |
| Private-rented | 27 | 22 | 24 | *317* |
| | | | | |
| Private Sector | 27 | 25 | 28 | *2,339* |
| Social Sector | 30 | 23 | 30 | *807* |
| **Household Type** | | | | |
| Single adult | 35 | 32 | 39 | *429* |
| Small adult | 15 | 11 | 14 | *495* |
| Single parent | 31 | 23 | 29 | *151* |
| Small family | 6 | 6 | 8 | *440* |
| Large family | 7 | 11 | 13 | *217* |
| Large adult | 20 | 15 | 18 | *328* |
| Older smaller | 40 | 33 | 40 | *587* |
| Single pensioner | 55 | 52 | 56 | *499* |
| **Weekly Income Band** | | | | |
| < £100 p.w. | 98 | 98 | 100 | *65* |
| £100 -199.99 p.w. | 83 | 81 | 88 | *444* |
| £200 -299.99 p.w. | 38 | 32 | 42 | *652* |
| £300 -399.99 p.w. | 15 | 15 | 19 | *483* |
| £400 -499.99 p.w. | 7 | 8 | 10 | *366* |
| £500 -699.99 p.w. | 4 | 5 | 6 | *541* |
| £700+ | 2 | 2 | 3 | *595* |
| **Council Tax Band** | | | | |
| A | 33 | 28 | 34 | *653* |
| B | 25 | 25 | 30 | *783* |
| C | 26 | 21 | 26 | *531* |
| D | 25 | 20 | 23 | *368* |
| E | 31 | 22 | 24 | *419* |
| F | 23 | 26 | 30 | *218* |
| G | 27 | 31 | 34 | *135* |
| H | - | - | - | *11* |
| Unobtainable | - | - | - | *28* |
| | | | | |
| **All Scotland** | 28 | 25 | 29 | *3,146* |

*Source: SHCS 2011*

# 5 Housing Quality

## 5.1 The Scottish Housing Quality Standard

119. Two quality standards are set by the Scottish Government and monitored through the Scottish House Condition Survey.

120. The first is the tolerable standard which is a "condemnatory" standard. In other words, it is not reasonable to expect people to continue to live in a house that falls below it. The tolerable standard was redefined in the Housing (Scotland) Act 2006 and applies to all houses in Scotland. Local authorities have a statutory duty and specific powers to deal with houses that fall below the tolerable standard.

121. The second standard is the Scottish Housing Quality Standard (SHQS) which was announced by the Minister for Communities in February 2004[30]. A target was agreed that all social landlords must ensure that all their dwellings pass the SHQS by 2015. Private owners and private landlords are currently under no obligation to bring their properties up to a standard which meets the SHQS. However the same data is collected and reported for all dwellings to allow comparison across the housing stock.

122. The 2002 SHCS failure rate estimates were produced after the announcement[31]. The 2003/4 survey field work began in October 2003, before the final clarification of the SHQS in July 2004[32]. Thus, the 2002 and 2003/4 surveys did not gather all the data needed to fully assess dwellings against the SHQS. This was rectified for the 2004/5 survey and all later surveys including the 2011 survey.

123. The SHQS is an aggregation of the results from about 60 different programme modules aggregated into 5 higher-level classifications which in turn provide a single pass/fail classification for all dwellings. The 5 higher-level criteria are that the dwelling must be:

- above the statutory tolerable standard;[33]
- free from serious disrepair;
- energy efficient;
- with modern facilities and services;
- healthy, safe and secure.

[30] For more information see letter and notes at: http://www.scotland.gov.uk/Publications/2004/02/18860/32772
[31] Estimates for 2002 and 2003/4 are published in the 2005/6 SHCS Key Findings Report at http://www.scotland.gov.uk/Publications/2007/12/07131524/0
[32] See letter and notes available at: http://www.scotland.gov.uk/Publications/2004/07/19725/40741
[33] See section 6.9 for further information on the Tolerable Standard.

124. The tolerable standard definition was amended by the Housing (Scotland) Act 2006 to include additional criteria, covering thermal performance and electrical safety[34]. As the amendment was not implemented until April 2009, the results from the 2010 survey were the first year to be based on the amended standard. The change in definition caused the fail rate for the standard to increase from 0.7% in 2009 to 3.9% in 2010.

125. In 2011, 72,000 homes were found to be below tolerable standard (BTS), amounting to 3% of the housing stock (Table 30).

**Table 30** Below Tolerable Standard Housing by Tenure and Age of Dwelling

| | | Below Tolerable Standard | | | |
|---|---|---|---|---|---|
| | | *000s* | *Failure by Group* | *% of BTS Stock* | *Row Sample* |
| **Tenure** | *Owner-occupier* | 51 | 3.5% | 71% | *2050* |
| | *LA/other public* | 5 | 1.5% | 7% | *464* |
| | *HA/co-op* | 2 | 0.6% | 2% | *354* |
| | *Private-rented* | 14 | 5.0% | 20% | *342* |
| **Age of Dwelling** | *pre-1919* | 35 | 7.8% | 49% | *585* |
| | *1919-1944* | 16 | 5.4% | 23% | *420* |
| | *1945-1964* | 9 | 1.8% | 13% | *745* |
| | *1965-1982* | 6 | 1.1% | 9% | *768* |
| | *post 1982* | 5 | 0.9% | 7% | *692* |
| **Whole Stock** | | 72 | 3.0% | 100% | *3210* |

*Source: SHCS 2011*

126. 5% of private rented dwellings fail the tolerable standard, the highest failure rate by sector. These 14,000 homes account for 20% of the BTS stock.

127. Around 8% of pre-1919 dwellings fail the tolerable standard; these account for almost half (49%) of the dwellings that fail.

**Table 31** Scottish Housing Quality Standard 2008 - 2011 (000s and % failure)

| Tenure | SHQS Failure | Survey Year | | | |
|---|---|---|---|---|---|
| | | **2008** | **2009** | **2010** | **2011** |
| *Owner-occupier* | *Housholds (000s)* | 957 | 885 | 857 | 855 |
| | *%* | 65 | 62 | 59 | 59 |
| *LA/other public* | *Housholds (000s)* | 237 | 247 | 253 | 194 |
| | *%* | 69 | 69 | 69 | 58 |
| *HA/co-op* | *Housholds (000s)* | 146 | 141 | 140 | 118 |
| | *%* | 51 | 52 | 53 | 45 |
| *Private-rented* | *Housholds (000s)* | 153 | 157 | 157 | 181 |
| | *%* | 72 | 64 | 67 | 65 |
| *Private Sector* | *Housholds (000s)* | 1,109 | 1,042 | 1,014 | 1,037 |
| | *%* | 66 | 62 | 60 | 60 |
| *Social Sector* | *Housholds (000s)* | 383 | 388 | 393 | 313 |
| | *%* | 61 | 62 | 62 | 52 |
| *All housing* | *Housholds (000s)* | 1,493 | 1,429 | 1,407 | 1,349 |
| | *%* | 64 | 62 | 61 | 58 |
| **Total** | | **2,331** | **2,344** | **2,357** | **2,368** |
| *Sample size* | | *3,015* | *3,346* | *3,115* | *3,219* |

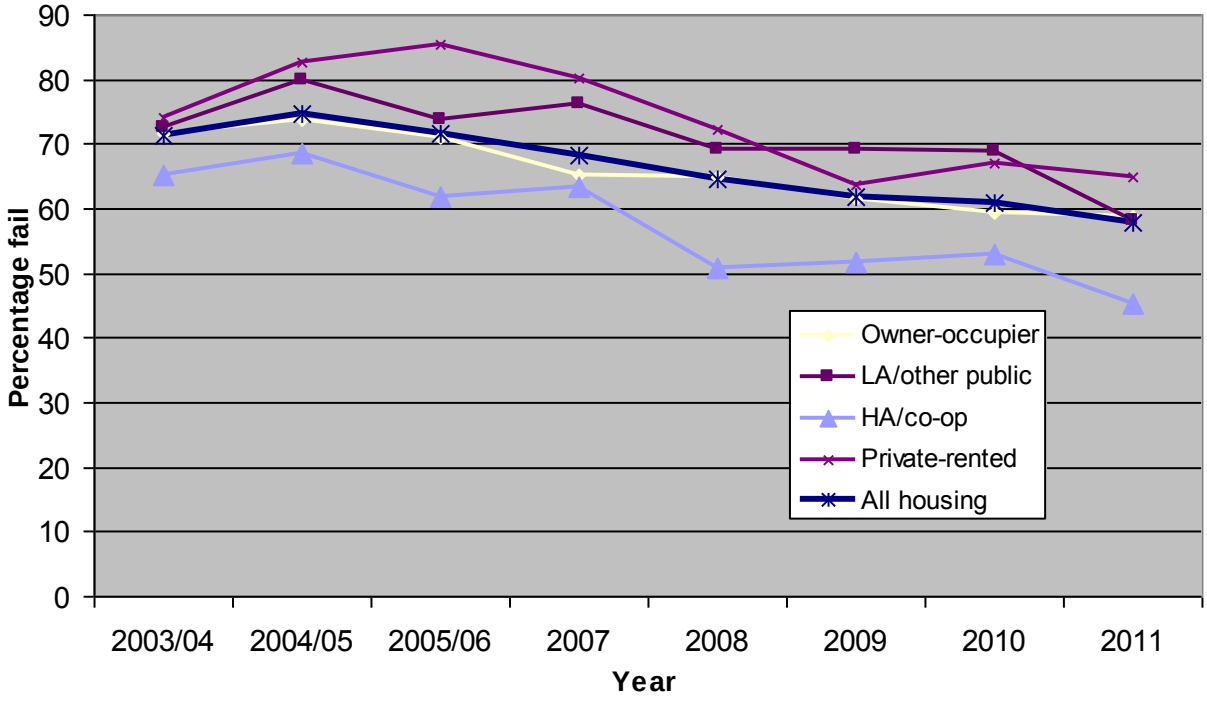
*Source: Continuous SHCS*

[34] See paragraph 185-188 for further information on the revised Tolerable Standard.

128. About 58% of the Scottish housing stock failed the SHQS in 2011. This was a significant decrease from 61% of dwellings in 2010. In 2011, the private rented sector had the highest failure rate at 65% (Table 31 and Figure 14).

129. Figure 14 shows steady decrease in the number of houses failing the SHQS. In 2004/05 around 75% of dwellings failed the SHQS compared to 58% in 2011.

**Figure 14** SHQS failures 2003/04 to 2011 by Tenure (%)




*Source: Continuous SHCS*

130. Table 32 shows that both tenure groups show an increased pass rate, but social housing is improving far faster overall. The proportion of dwellings failing the SHQS fell from around three quarters of both private and social sector dwellings in 2004/05 to 60% of private and 52% social failing in 2011.

131. The majority of dwellings that failed the SHQS failed the energy efficiency criterion. Full and efficient central heating[35] as well as minimum levels of thermal insulation - such as loft, hot water tank and wall insulation (where applicable) – are required. While this remains the most failed element, passes have increased across the board, most notably in the social sector where the pass rate has improved by 6 percentage points between 2009 and 2011.

[35] The definition of full central heating for SHQS purposes is: "whole dwelling or rooms representing more than 50% of the floor area of the dwelling with the heating controlled from a single point".

**Table 32** Scottish Housing Quality Standard element failure rate by tenure 2004/05 to 2011 (%)

| | | SHQS Element Failures (%) | | | |
|---|---|---|---|---|---|
| | | 2004/5 | 2007 | 2009 | 2011 |
| All tenures | **SHQS Flag** | 74 | 68 | 61 | 58 |
| | **Below Tolerable Standard** | 1 | 1 | 1 | 3 |
| | **Free from Serious Disrepair** | 3 | 3 | 2 | 3 |
| | **Energy Efficient** | 57 | 52 | 48 | 45 |
| | **Modern Facilities and Services** | 23 | 19 | 13 | 11 |
| | **Healthy, Safe and Secure** | 28 | 24 | 21 | 19 |
| Private Sector | **SHQS Flag** | 74 | 67 | 61 | 60 |
| | **Below Tolerable Standard** | 1 | 1 | 1 | 4 |
| | **Free from Serious Disrepair** | 3 | 4 | 2 | 3 |
| | **Energy Efficient** | 61 | 53 | 50 | 48 |
| | **Modern Facilities and Services** | 18 | 15 | 10 | 10 |
| | **Healthy, Safe and Secure** | 28 | 23 | 21 | 19 |
| Social Sector | **SHQS Flag** | 73 | 70 | 60 | 52 |
| | **Below Tolerable Standard** | 0 | 1 | 1 | 1 |
| | **Free from Serious Disrepair** | 2 | 2 | 2 | 1 |
| | **Energy Efficient** | 48 | 48 | 42 | 36 |
| | **Modern Facilities and Services** | 38 | 29 | 21 | 12 |
| | **Healthy, Safe and Secure** | 28 | 27 | 22 | 18 |

*Source: Continuous SHCS*

132. The proportion of dwellings failing the modern facilities and services criterion of the SHQS has also fallen since 2004/05 in both the social and private sectors. Overall it fell from 23% in 2004/5 to 11% of dwellings in 2011 (Table 32). The change from 2007 (19%) to 2011 (11%) is statistically significant.

133. Table 33 shows that the proportion of dwellings with more than one criterion failure has fallen since 2004/05. In 2011, 40% of dwellings failed on only one of the five higher-level criteria and 13% on two criteria. As a result, the number of SHQS element failures (as opposed to failing properties) has reduced from about 2.6 million to 1.9 million (Table 33)[36].

134. Table 34 shows that dwellings in rural areas are significantly more likely to fail the SHQS than in urban areas.

**Table 33** SHQS criterion failures 2008-2011 (000s and Column %)

| | 2004/5 | | 2007 | | 2009 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| **SHQS Criterion Failures** | **000's** | **%** | **000's** | **%** | **000's** | **%** | **000's** | **%** |
| No failures/ unobtainable | 605 | 26 | 750 | 32 | 915 | 39 | 1,019 | 43 |
| 1 Failure | 1,025 | 45 | 1,008 | 44 | 988 | 42 | 942 | 40 |
| 2 Failures | 484 | 21 | 404 | 17 | 343 | 15 | 301 | 13 |
| 3 Failures | 162 | 7 | 140 | 6 | 90 | 4 | 86 | 4 |
| 4 Failures | 24 | 1 | 11 | 0 | 8 | 0 | 17 | 1 |
| 5 Failures | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 0 |
| Failures sub-total | 1,696 | 74 | 1,564 | 68 | 1,429 | 61 | 1,349 | 57 |
| Total SHQS criterion failures | 2,578 | | 2,286 | | 1,976 | | 1,888 | |
| **Total dwellings** | **2,301** | **100** | **2,314** | **100** | **2,344** | **100** | **2,368** | **100** |
| Unweighted sample size | *3,093* | | *3,033* | | *3,346* | | *3,219* | |

*Source: Continuous SHCS*

[36] The SHQS failures count is on a per-dwelling basis. Where an SHQS failure is to a shared element, e.g. disrepair to a party wall, this failure will be counted twice. As a result the true number of criterion failures will be lower.

**Table 34** SHQS urban/rural breakdown (000s and %)

| | Urban | | Rural | | *Unweighted* |
|---|---|---|---|---|---|
| | **000's** | **%** | **000's** | **%** | |
| Pass | 836 | 43 | 145 | 37 | *1,321* |
| Fail | 1,101 | 57 | 249 | 63 | *1,855* |
| **Total** | **1,970** | **100** | **398** | **100** | ***3,219*** |
| | | | | | |
| *Unweighted sample size* | *2,462* | | *714* | | |

*Source: SHCS 2011*

## 5.2 Dampness and Condensation

135. 'Any condensation' and 'Any rising or penetrating damp' can cover anything from a small damp patch or area of condensation on a single wall in one room (caused for example by ineffective ventilation whilst cooking) to prevalence throughout a dwelling, so is not necessarily a serious housing quality issue in all cases.

136. Rising damp is the result of defective or missing damp proof coursing leading to water leaching into the building fabric. Penetrating damp is usually the result of a defect in the building fabric, such as damage to the walls or roof, water ingress due to damaged seals on doors or windows or damp as a result of leaking plumbing.

137. Table 35 and Table 36 indicate that just over 1 in 10 dwellings had condensation in at least one room, whilst few dwellings in Scotland suffered from either rising or penetrating damp (around 1 in 30). These figures are largely unchanged from those reported from 2002 to 2010.

**Table 35** Presence of condensation in dwelling (000s and %)

| Any condensation? | 000s | % | *Unweighted sample size* |
|---|---|---|---|
| None | 2,106 | 89 | *2,871* |
| Some | 262 | 11 | *348* |
| **Total** | **2,368** | **100** | ***3,219*** |

*Source: SHCS 2011*

**Table 36** Presence of rising or penetrating damp in dwelling (000s and %)

| Any rising or penetrating damp? | 000s | % | *Unweighted sample size* |
|---|---|---|---|
| None | 2,289 | 97 | *3,095* |
| Some | 79 | 3 | *124* |
| **Total** | **2,368** | **100** | ***3,219*** |

*Source: SHCS 2011*

## 5.3 Disrepair

138. Data on the state of disrepair of each dwelling is gathered in the physical inspection part of the SHCS. For clarification, the definition of 'disrepair' here is not the same at that measured in SHQS (section 5.1 above) which requires a property to be "free from serious disrepair" so the numbers and percentages will be different from the SHQS data[37].

139. A range of elements - both internal and external - are assessed for the presence of disrepair, the urgency of disrepair (for external and common elements only), the extent of disrepair and in some cases the residual life of the element. These assessments allow an overall picture of the state of dwelling disrepair to be built up. We can therefore estimate the extent of disrepair of various types in Scotland's occupied housing stock. Definitions of the different types of disrepair are given in paragraph 189.

**Table 37** Presence of any disrepair by age of dwelling, tenure and urban/rural indicator (000s and Row %)

| | No disrepair | | Disrepair | | Total | | *Sample size* |
|---|---|---|---|---|---|---|---|
| | 000s | % | 000s | % | 000s | % | |
| **Age of Dwelling** | | | | | | | |
| Pre-1919 | 37 | 8 | 422 | 92 | **459** | **100** | *590* |
| 1919-1944 | 21 | 7 | 281 | 93 | **303** | **100** | *422* |
| 1945-1964 | 37 | 7 | 486 | 93 | **523** | **100** | *747* |
| 1965-1982 | 94 | 17 | 471 | 83 | **565** | **100** | *768* |
| Post-1982 | 225 | 43 | 294 | 57 | **519** | **100** | *692* |
| **Tenure** | | | | | | | |
| Owner-occupier | 302 | 21 | 1,167 | 79 | **1,468** | **100** | *2,054* |
| LA/other public | 34 | 10 | 311 | 90 | **345** | **100** | *464* |
| HA/co-op | 46 | 17 | 226 | 83 | **272** | **100** | *355* |
| Private-rented | 32 | 11 | 251 | 89 | **283** | **100** | *346* |
| Private Sector | 334 | 19 | 1,417 | 81 | **1,751** | **100** | *2,400* |
| Social Sector | 80 | 13 | 536 | 87 | **617** | **100** | *819* |
| **Urban/Rural** | | | | | | | |
| Urban | 343 | 17 | 1,627 | 83 | **1,970** | **100** | *2,498* |
| Rural | 71 | 18 | 327 | 82 | **398** | **100** | *721* |
| **All Dwellings** | **414** | **17** | **1,954** | **83** | **2,368** | **100** | ***3,219*** |
| *Sample size* | *559* | | *2,660* | | ***3,219*** | | |

*Source: SHCS 2011*

140. 'Any disrepair' covers all disrepair, irrespective of extent or seriousness, and can therefore mean anything from a leaking bathroom tap to a missing roof.

141. Table 37 shows the presence of 'any disrepair' by age of dwelling. Just over eighty percent (83%) of dwellings in Scotland have some disrepair. Older dwellings are more likely to have some form of disrepair with 92% of those built before 1919 having some disrepair compared with 57% of dwellings built after 1982.

[37] For the definition of SHQS "serious disrepair", see SHQS Guidance Annex B http://www.scotland.gov.uk/Topics/Built-Environment/Housing/16342/shqs/AppendixB

142. In the private sector, 81% of dwellings have some form of disrepair, compared to 87% of dwellings in the social sector.

143. Levels of 'any disrepair' in urban and rural areas are about the same.

144. For common and external elements the surveyor is asked to assess the urgency of disrepair. An urgent repair is one which, if not carried out, would cause the fabric of the building to deteriorate further and/or place the health and safety of the occupier at risk. Table 38 shows 'any disrepair' by 'urgency of disrepair'.

**Table 38** Urgent disrepair in buildings with some disrepair (000s and Column %)

| Any urgent disrepair | Any Disrepair 000s | % | Total 000s | % | *Sample Size* |
|---|---|---|---|---|---|
| **None** | 904 | 46 | **904** | **38** | *1,226* |
| **Some** | 939 | 48 | **939** | **40** | *1,278* |
| **Not Applicable** | 108 | 6 | **513** | **22** | *702* |
| **Unobtainable** | 3 | 0 | **12** | **1** | *13* |
| **Total** | **1,954** | **100** | **2,368** | **100** | ***3,219*** |
| *Sample size* | *2,660* | | ***3,219*** | | |

*Source: SHCS 2011*

145. Figure 15(a-c) shows the presence of urgent disrepair, disrepair to critical elements and extensive disrepair in dwellings which have some form of disrepair (i.e. dwellings which have 'any disrepair' as defined above).

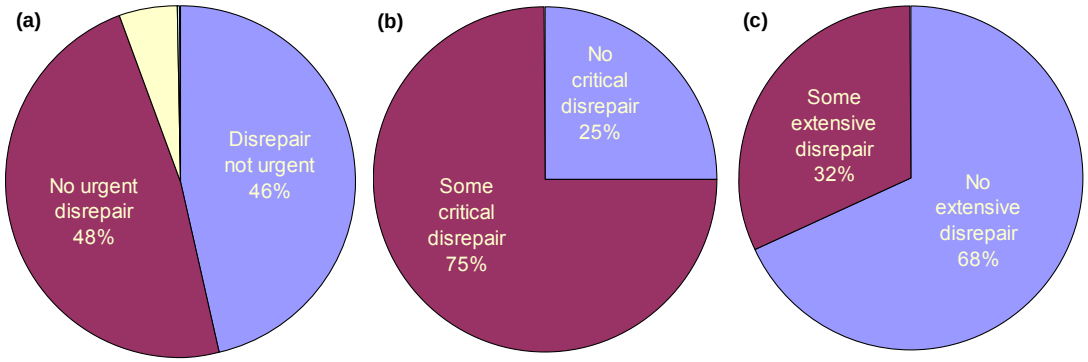
146. Critical elements are those whose condition is central to a dwelling being wind and weather proof, structurally stable and safeguarded against further rapid deterioration. Paragraph 189 lists the critical elements. The figures for critical disrepair are shown in Table 39 against dwelling and household characteristics.

147. 'Extensive disrepair' is used to identify dwellings where the disrepair present is of relatively greater severity. A detailed definition of extensive disrepair is given in paragraph 189.

148. Urgent disrepair, extensive disrepair and disrepair to critical elements are all subsets of 'any disrepair'.

149. In just under half of dwellings (48%) with some form of disrepair, that disrepair is urgent. Three quarters of dwellings with any disrepair have some disrepair to critical elements whilst around a third (32%) suffer from extensive disrepair (Figure 15(a-c)).

**Figure 15** Of those dwellings with any disrepair: (a) urgency of disrepair (b) some disrepair to critical elements and (c) some extensive disrepair (%)




*Source: SHCS 2011*

**Table 39** Disrepair to critical elements by age of dwelling, tenure and urban/rural indicator (000s and Row %)

| | No disrepair to critical elements | | Disrepair to critical elements | | Total | | *Unweighted sample size* |
|---|---|---|---|---|---|---|---|
| | 000s | % | 000s | % | 000s | % | |
| **Age of dwelling** | | | | | | | |
| Pre-1919 | 105 | 23 | 355 | 77 | **459** | **100** | *590* |
| 1919-1944 | 74 | 25 | 228 | 75 | **303** | **100** | *422* |
| 1945-1964 | 149 | 28 | 374 | 72 | **523** | **100** | *747* |
| 1965-1982 | 221 | 39 | 344 | 61 | **565** | **100** | *768* |
| Post-1982 | 353 | 68 | 166 | 32 | **519** | **100** | *692* |
| **Tenure** | | | | | | | |
| Owner-occupier | 605 | 41 | 863 | 59 | **1,468** | **100** | *2,054* |
| LA/other public | 91 | 26 | 254 | 74 | **345** | **100** | *464* |
| HA/co-op | 121 | 44 | 151 | 56 | **272** | **100** | *355* |
| Private-rented | 84 | 30 | 199 | 70 | **283** | **100** | *346* |
| Private Sector | 690 | 39 | 1,062 | 61 | **1,751** | **100** | *2,400* |
| Social Sector | 212 | 34 | 405 | 66 | **617** | **100** | *819* |
| **Urban/Rural** | | | | | | | |
| Urban | 760 | 39 | 1,209 | 61 | **1,970** | **100** | *2,498* |
| Rural | 141 | 35 | 257 | 65 | **398** | **100** | *721* |
| **All Dwellings** | **902** | **38** | **1,467** | **62** | **2,368** | **100** | ***3,219*** |
| *Unweighted sample size* | *1,205* | | *2,014* | | ***3,219*** | | |

*Source: SHCS 2011*

150. Table 39 shows that the likelihood of experiencing disrepair to critical elements increases with the age of the dwelling. More than three-quarters of pre-1919 dwellings have some form of disrepair to critical elements, compared to about one third of those built after 1982.

151. Just over half of owner-occupied dwellings and just over half of dwellings rented from housing associations and housing co-operatives have some form of critical disrepair compared with 70% of those which are rented from a private landlord and 74% of those rented from a local authority or other public sector organisation. Overall, dwellings in the social sector are more likely to have disrepair to critical elements than those in the private sector.

152. Table 40 shows that 26% of dwellings in Scotland have some extensive disrepair. Following the same trend as 'any disrepair' and 'disrepair to critical elements', newer dwellings are less likely to suffer from extensive disrepair. Of dwellings built before 1919, 38% have some extensive disrepair compared with just 8% of those built after 1982.

153. Owner-occupied, Housing Association and housing co-operative dwellings are least likely to have some extensive disrepair.

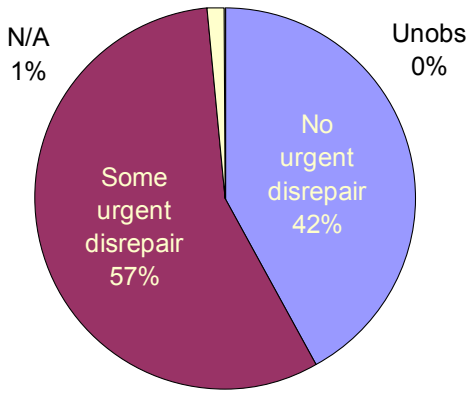
**Table 40** Extensive disrepair by age of dwelling, tenure and urban/rural indicator (000s and Row %)

| | No extensive | | Some extensive | | Total | | *Unweighted* |
|---|---|---|---|---|---|---|---|
| | 000s | % | 000s | % | 000s | % | *sample size* |
| **Age of Dwelling** | | | | | | | |
| Pre-1919 | 285 | 62 | 174 | 38 | **459** | **100** | *590* |
| 1919-1944 | 196 | 65 | 107 | 35 | **303** | **100** | *422* |
| 1945-1964 | 372 | 71 | 151 | 29 | **523** | **100** | *747* |
| 1965-1982 | 423 | 75 | 142 | 25 | **565** | **100** | *768* |
| Post-1982 | 476 | 92 | 42 | 8 | **519** | **100** | *692* |
| **Tenure** | | | | | | | |
| Owner-occupier | 1,143 | 78 | 325 | 22 | **1,468** | **100** | *2,054* |
| LA/other public | 232 | 67 | 113 | 33 | **345** | **100** | *464* |
| HA/co-op | 200 | 74 | 72 | 26 | **272** | **100** | *355* |
| Private-rented | 178 | 63 | 106 | 37 | **283** | **100** | *346* |
| Private Sector | 1,320 | 75 | 431 | 25 | **1,751** | **100** | *2,400* |
| Social Sector | 432 | 70 | 185 | 30 | **617** | **100** | *819* |
| **Urban/Rural** | | | | | | | |
| Urban | 1,466 | 74 | 503 | 26 | **1,970** | **100** | *2,498* |
| Rural | 286 | 72 | 113 | 28 | **398** | **100** | *721* |
| **All Dwellings** | **1,752** | **74** | **616** | **26** | **2,368** | **100** | ***3,219*** |
| *Unweighted sample size* | *2,399* | | *820* | | ***3,219*** | | |

*Source: SHCS 2011*

154. For 57% of dwellings with some disrepair to critical elements the disrepair is urgent (Figure 16).

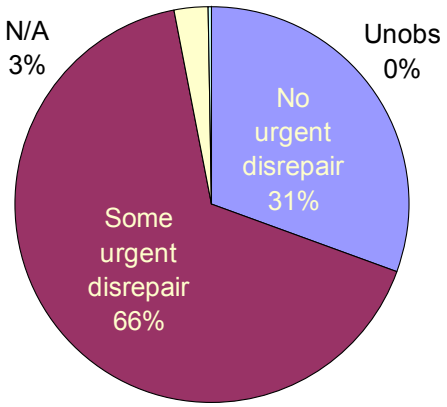
**Figure 16** Urgent disrepair in dwellings with some form of disrepair to critical elements (%)




*Source: SHCS 2011*

155. In 66% of dwellings with extensive disrepair, the disrepair is classed as 'urgent' (Figure 17).

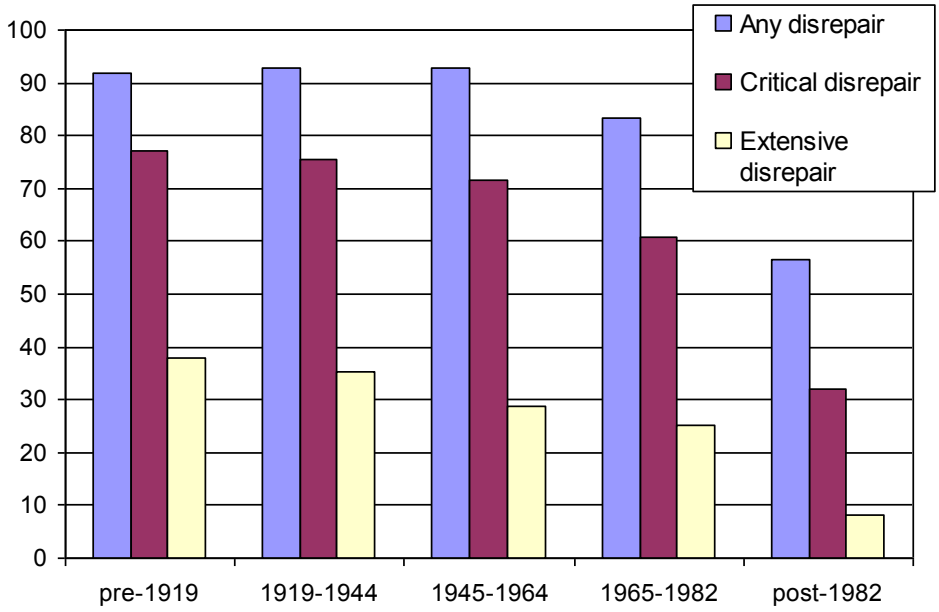
**Figure 17** Urgent disrepair in dwellings with some form of extensive disrepair (%)




*Source: SHCS 2011*

156. Figure 18 shows the proportion of dwellings in each age group which experience 'any disrepair', 'disrepair to critical elements' and 'extensive disrepair'.

**Figure 18** Any disrepair, critical element and extensive disrepair by age of dwelling (%)




*Source: SHCS 2011*

# 6 Notes and Definitions

## 6.1 Sampling

157. The aim of surveys such as the SHCS is to select a sample which represents well the population as a whole, thus ensuring that any estimates obtained from the survey data are as close as possible to the true population value. However any randomly chosen sample may give results which, by chance, are either higher or lower than the true value in the population and no two samples are likely to give exactly the same picture of the household population. Response bias will have a further effect (for example non-response households are more likely to consist of a young, single males than the household population as a whole). In general, the smaller the sample size, the greater the likelihood the estimate could be misleading, so care must be taken when using subsets of the survey sample for analysis.

158. In 2011, the response rate to the social survey was 69.6%, a full physical survey was then completed at 81.5% of properties where a social survey interview was conducted. The data are re-weighted to take account of unequal probability of selection and non response. While this does not guarantee that we fully reflect the profile of missing households and their residents it does provide more statistically robust estimates. Full details are provided in the Technical Report which accompanies this publication.

## 6.2 Confidence intervals

159. Whilst we cannot quantify the extent of bias due to non-response, we can quantify the likely extent of sampling variability by calculating the 'standard error' associated with an estimate. By convention, a '95% confidence interval' is used to demonstrate the variability. On average there is a 1 in 20 chance that the true value will fall outside the given confidence interval or, conversely, there is a 95% chance that the true value will fall within the given confidence interval.

160. Table 41 shows the 95% confidence limits for estimates for a range of percentages calculated from sub-samples of a range of sizes. Note that the confidence limits for estimates of x% and (100-x) % are the same. The interpretation and use of this table are best demonstrated by an example.

161. In Table 15, 49% of detached houses were rated 'good' in terms of energy efficiency. To the right of the table it says that the sample size of detached houses was 792. Looking at Table 41 and reading across the 800 row to the 45% column (the nearest to our figures), we get a confidence interval of ±3.5%. Thus we can say that we are 95% confident that the true proportion of detached houses with a 'good' energy rating is between 45.5 and 52.5 (49% ± 3.5%)[38].

[38] Assuming no design effect - see paragraphs 162-164.

**Table 41** 95% Confidence Limits for estimates based on SHCS sub-samples of various sizes (without design effects)

| Sub-sample size (i.e. the "n=" value corresponding to 100%) | Estimate (lookup to nearest multiple of 5%) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1% or 99% | 2% or 98% | 5% or 95% | 10% or 90% | 15% or 85% | 20% or 80% | 25% or 75% | 30% or 70% | 35% or 65% | 40% or 60% | 45% or 55% | 50% |
| | percentage points ( + / - ) | | | | | | | | | | | |
| **100** | 2.0 | 2.7 | 4.3 | 5.9 | 7.0 | 7.8 | 8.5 | 9.0 | 9.3 | 9.6 | 9.8 | 9.8 |
| **150** | 1.6 | 2.2 | 3.5 | 4.8 | 5.7 | 6.4 | 6.9 | 7.3 | 7.6 | 7.8 | 8.0 | 8.0 |
| **200** | 1.4 | 1.9 | 3.0 | 4.2 | 4.9 | 5.5 | 6.0 | 6.4 | 6.6 | 6.8 | 6.9 | 6.9 |
| **250** | 1.2 | 1.7 | 2.7 | 3.7 | 4.4 | 5.0 | 5.4 | 5.7 | 5.9 | 6.1 | 6.2 | 6.2 |
| **300** | 1.1 | 1.6 | 2.5 | 3.4 | 4.0 | 4.5 | 4.9 | 5.2 | 5.4 | 5.5 | 5.6 | 5.7 |
| **350** | 1.0 | 1.5 | 2.3 | 3.1 | 3.7 | 4.2 | 4.5 | 4.8 | 5.0 | 5.1 | 5.2 | 5.2 |
| **400** | 1.0 | 1.4 | 2.1 | 2.9 | 3.5 | 3.9 | 4.2 | 4.5 | 4.7 | 4.8 | 4.9 | 4.9 |
| **450** | 0.9 | 1.3 | 2.0 | 2.8 | 3.3 | 3.7 | 4.0 | 4.2 | 4.4 | 4.5 | 4.6 | 4.6 |
| **500** | 0.9 | 1.2 | 1.9 | 2.6 | 3.1 | 3.5 | 3.8 | 4.0 | 4.2 | 4.3 | 4.4 | 4.4 |
| **600** | 0.8 | 1.1 | 1.7 | 2.4 | 2.9 | 3.2 | 3.5 | 3.7 | 3.8 | 3.9 | 4.0 | 4.0 |
| **700** | 0.7 | 1.0 | 1.6 | 2.2 | 2.6 | 3.0 | 3.2 | 3.4 | 3.5 | 3.6 | 3.7 | 3.7 |
| **800** | 0.7 | 1.0 | 1.5 | 2.1 | 2.5 | 2.8 | 3.0 | 3.2 | 3.3 | 3.4 | 3.4 | 3.5 |
| **900** | 0.7 | 0.9 | 1.4 | 2.0 | 2.3 | 2.6 | 2.8 | 3.0 | 3.1 | 3.2 | 3.3 | 3.3 |
| **1,000** | 0.6 | 0.9 | 1.4 | 1.9 | 2.2 | 2.5 | 2.7 | 2.8 | 3.0 | 3.0 | 3.1 | 3.1 |
| **1,100** | 0.6 | 0.8 | 1.3 | 1.8 | 2.1 | 2.4 | 2.6 | 2.7 | 2.8 | 2.9 | 2.9 | 3.0 |
| **1,200** | 0.6 | 0.8 | 1.2 | 1.7 | 2.0 | 2.3 | 2.5 | 2.6 | 2.7 | 2.8 | 2.8 | 2.8 |
| **1,300** | 0.5 | 0.8 | 1.2 | 1.6 | 1.9 | 2.2 | 2.4 | 2.5 | 2.6 | 2.7 | 2.7 | 2.7 |
| **1,400** | 0.5 | 0.7 | 1.1 | 1.6 | 1.9 | 2.1 | 2.3 | 2.4 | 2.5 | 2.6 | 2.6 | 2.6 |
| **1,500** | 0.5 | 0.7 | 1.1 | 1.5 | 1.8 | 2.0 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 |
| **1,600** | 0.5 | 0.7 | 1.1 | 1.5 | 1.7 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.4 | 2.5 |
| **1,700** | 0.5 | 0.7 | 1.0 | 1.4 | 1.7 | 1.9 | 2.1 | 2.2 | 2.3 | 2.3 | 2.4 | 2.4 |
| **1,800** | 0.5 | 0.6 | 1.0 | 1.4 | 1.6 | 1.8 | 2.0 | 2.1 | 2.2 | 2.3 | 2.3 | 2.3 |
| **1,900** | 0.4 | 0.6 | 1.0 | 1.3 | 1.6 | 1.8 | 1.9 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 |
| **2,000** | 0.4 | 0.6 | 1.0 | 1.3 | 1.6 | 1.8 | 1.9 | 2.0 | 2.1 | 2.1 | 2.2 | 2.2 |
| **2,200** | 0.4 | 0.6 | 0.9 | 1.3 | 1.5 | 1.7 | 1.8 | 1.9 | 2.0 | 2.0 | 2.1 | 2.1 |
| **2,400** | 0.4 | 0.6 | 0.9 | 1.2 | 1.4 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.0 | 2.0 |
| **2,600** | 0.4 | 0.5 | 0.8 | 1.2 | 1.4 | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 |
| **2,800** | 0.4 | 0.5 | 0.8 | 1.1 | 1.3 | 1.5 | 1.6 | 1.7 | 1.8 | 1.8 | 1.8 | 1.9 |
| **3,000** | 0.4 | 0.5 | 0.8 | 1.1 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.8 | 1.8 |
| **3,200** | 0.3 | 0.5 | 0.8 | 1.0 | 1.2 | 1.4 | 1.5 | 1.6 | 1.7 | 1.7 | 1.7 | 1.7 |
| **3,400** | 0.3 | 0.5 | 0.7 | 1.0 | 1.2 | 1.3 | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.7 |
| **3,600** | 0.3 | 0.5 | 0.7 | 1.0 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 |
| **3,800** | 0.3 | 0.4 | 0.7 | 1.0 | 1.1 | 1.3 | 1.4 | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 |
| **4,000** | 0.3 | 0.4 | 0.7 | 0.9 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.5 | 1.5 | 1.5 |

## 6.3 Design effects

162. However, it is important to adjust these intervals by multiplying by the design effects for the survey. The design effect is the ratio between the variance (average deviation of a set of data points from their mean value) of a variable under the sampling method used (actual) and the variance computed under the assumption of simple random sampling (standard). In short, a design effect of 2 would mean doubling the size of a simple random sample to obtain the same volume of information; a design effect of 0.5 implies the reverse. Design effect adjustments are necessary when adjusting standard errors which are affected by the design and complexity of the survey.

163. Generally speaking, disproportionate stratification and sampling with non-equal probabilities tends to increase standard errors, giving a design effect greater than 1. However, this can be controlled by deliberately over-sampling in stratum where the item of interest is either very rare or variable. The impact of non-response weighting on standard errors tends to be, although with exceptions, comparatively limited. The sampling design of the SHCS meets the criteria above in that disproportionate stratification is applied across the 32 local authority areas with over-sampling of remote rural areas – for example in Shetland and Orkney. As a result, one would expect the design effect to be above 1 although only modestly so.

164. Table 42 shows the design effects for all the SHCS surveys since 1991. When using a mixture of the Physical and Social Survey data, the Physical Survey design effect must be used. The design effects for the 2011 SHCS are 1.12 for the Physical and 1.11 for the Social surveys. When producing estimates at local authority level, no design effect adjustment is necessary for adjusting standard errors because simple (actually equal interval) random sampling was carried out *within* each local authority.

**Table 42** Design Effects for SHCS, 1991-2011

| | Design Effect | |
|---|---|---|
| Survey Year | Physical Weight | Social Weight |
| 1991 | 1.09 | 1.09 |
| 1996 | 1.11 | 1.11 |
| 2002 | 1.11 | 1.10 |
| 2003/04 | 1.14 | 1.13 |
| 2004/05 | 1.18 | 1.17 |
| 2005/06 | 1.14 | 1.14 |
| 2007 | 1.13 | 1.11 |
| 2008 | 1.11 | 1.11 |
| 2009 | 1.09 | 1.08 |
| 2010 | 1.11 | 1.1 |
| 2011 | 1.12 | 1.11 |

165. The median may be a better measure of central tendency than the mean for some SHCS results as the median is less affected by skewed distributions and the small number of outlying values which naturally occur in the data.

166. Numbers of cases are rounded to the nearest thousand and percentages to the nearest integer. This rounding may mean that in some cases the percentages do not add up to 100. A blank cell represents no survey cases. Zeroes correspond to either a count of less than 500 or a percentage of less than 0.5%.

## 6.4 Dwelling types

167. The SHCS uses the following definitions of dwelling types:

- **Detached house:** a house that is free standing with no party walls;
- **Semi-detached house:** a house that is only attached to one other dwelling, commercial premise etc. The two properties taken together should be detached from any other properties;

- **Terraced house:** a house forming part of a row of three or more dwellings, commercial premises etc;
- **Tenement flat:** a dwelling within a common block of two or more floors (commonly up to five storeys but may be higher in certain circumstances) where some or all of the flats have a shared or common vertical access. The selected dwelling need not share the access, but may be situated within the block with shared/common access (own door flat);
- **4-in-a-block:** each flat in a block has its own independent access. Flats on the upper level have an internal or external stair;
- **Tower/slab:** flats in a high rise (ten or more storeys) or flats where the common circulation is predominantly horizontal (maisonette, balcony or gallery access);
- **Flat from a conversion:** flats resulting from the conversion of a house only. A flat converted from a non-residential building (e.g. a warehouse) is classified according to the above flat types.

## 6.5 Household types

168. Households are allocated to one of eight types as shown below:

- **Single adult:** 1 adult of non-pensionable age and no children;
- **Small adult:** 2 adults of non-pensionable age and no children;
- **Single parent:** 1 adult of any age and 1 or more children;
- **Small family:** 2 adults and 1 or 2 children;
- **Large family:** 2 adults and 3 or more children or 3 or more adults and 1 or more children;
- **Large adult:** 3 or more adults and no children;
- **Older smaller:** 2 adults at least one of whom is of pensionable age and no children;
- **Single pensioner:** 1 adult of pensionable age and no children.

## 6.6 Energy Ratings and Labels

169. The way a building is constructed, insulated, heated and ventilated and the type of fuel used, all contribute to its energy consumption and carbon emissions. The use of ‘energy labels’ provides a method of demonstrating the results of complex calculations in an easy-to-understand way.

### National Home Energy Rating (NHER)

170. The NHER assessment procedure is not based on what a household actually spends on fuel. It is based on a model (produced by the National Energy Services) of the theoretical costs ('Total Energy costs') of maintaining a standard heating regime for a standard level of occupancy derived from knowledge of the appliances, fuel sources, insulation, size and dwelling type of the premises. Total energy costs include space and water heating, lighting, standard domestic appliances (e.g. washing machine) and standing charges. The model contains a factor for local climate variations which take into account differences across the UK. In reality household fuel use may be different to that assumed in the model.

171. Level 0 is the simplest of the four NHER assessment levels. It involves measuring up to 19 items and takes about 5 minutes per dwelling. The SHCS uses an enhanced level 0 assessment which includes many of the items recorded in the level 1 assessment and 1 item recorded in the level 2 assessment. At this level, the scale, used properly, does not allow scores for individual dwellings to be quoted, but does give the distribution of NHER across subsets of greater than 100 dwellings and therefore the stock as a whole. For further information see the SHCS 2002 National Report Technical Annex 9[39].

### Standard Assessment Procedures (SAP)

172. SAP is the Government's Standard Assessment Procedure for Energy Rating of Dwellings.

### SAP 2005[40]

173. SAP 2005 is adopted by government as part of the UK national methodology for calculation of the energy performance of buildings.

174. It is scaled from 1 (poor) to 100 (excellent) and reflects the energy cost per square metre for the lighting, space and water heating of a dwelling. SAP takes no account of geography or climatic conditions.

175. It is used to demonstrate compliance with building regulations for dwellings - Part L (England and Wales), Section 6 (Scotland) and Part F (Northern Ireland) - and to provide energy ratings for dwellings.

### SAP 2001[41]

176. The SHCS also includes data on the previous version of SAP (SAP 2001) for comparability with previous surveys. It is scaled from 1 (poor) to 120 (excellent). SAP 2001 only takes space and water heating into account (whereas SAP 2005 also includes lighting). This data is available on request. As with all versions of SAP it takes no account of regional or climatic conditions in its calculation.

[39] Available to download at http://www.scotland.gov.uk/Topics/Statistics/SHCS/NationalReport2002
[40] More information is available at http://projects.bre.co.uk/sap2005/
[41] More information is available at http://projects.bre.co.uk/sap2001/

## Energy Efficiency Ratings (EERs)

177. The Energy Performance Certificate (EPC) is a measure introduced to promote the improvement of energy efficiency of buildings. This is part of a programme of changes being rolled out across Europe to reflect energy efficiency legislation.

178. The EPC Energy Efficiency Rating (EER) letter reflects the SAP 2005 score in a simplified form (Table 43); the higher the rating the more energy efficient the home and the lower the fuel bills should be.

**Table 43** EPC Energy Efficiency Rating (EER) and SAP 2005 Ratings

| EER | SAP 2005 Rating |
|---|---|
| **A** | 92 – 100 |
| **B** | 81 – 91 |
| **C** | 69 – 80 |
| **D** | 55 – 68 |
| **E** | 39 – 54 |
| **F** | 21 – 38 |
| **G** | 1 – 20 |

179. The SHCS emulates RDSAP and EERs from the SAP 2001 scores together with the fuel use based on Table 16 of the SAP 2005 Methodology[42]. The main differences between the SHCS and EPC methodology lie in the following areas:

- SEDBUK data for boilers was not recorded;
- Extensions were not treated separately;
- Under floor insulation was not recorded – the software determines thickness where required by building standards using age band data;
- Roof/loft insulation location was always assumed to be between joists;
- Meter data was implied from electricity type.

180. However, against these weaknesses, stated quality standards by one protocol organisation are that 95% of EPCs are within +/- 5 SAP points - where SAP ranges within the A-G rating are on average about 14 points.

181. Again, the EER does not reflect climatic differences across Scotland. So a house in Galloway with the same EER rating as a house in Shetland (or in Cornwall) indicates that the quality of the house is similar in respect of EER factors, but does not fully reflect the actual level of energy required for a dwelling in those different climates.

[42] The most recent SAP 2005 methodology paper is available at http://projects.bre.co.uk/sap2005/pdf/SAP2005_9-83.pdf

## 6.7 Energy Prices

182. Figure 11, Table 44 and Table 45 show how energy prices have increased between May 1996 and July 2011 (each is the latest period for which prices are available). Using changes in the index for fuel and light as a broad indicator of changes in fuel prices faced by households it is notable that between 1996 and 2002, when the proportion of households in fuel poverty fell to less than 38% of its 1996 value (Table 23), the price of fuel and light decreased by 19% in real terms. By 2005 the real price of fuel and light was 7% below its 1996 level and the proportion of fuel poor households was around two thirds of its 1996 level. The real price of fuel and light increased by 24% from May 2005 (the midpoint of the 2004/5 survey year) to May 2006 (the midpoint of the 2005/6 survey year) whereas the overall RPI (Retail Price Index) increase was 3% in the same period. Since May 2003 fuel prices have been increasing at a greater rate than GDP, however in 2010 for the first time since May 2003 fuel prices (apart from heating oils) decreased and GDP continued its steady increase of about 2% per annum.

183. Price rises from 2010 to 2011 showed large increases in heating oil costs (44 points), with smaller increases in the costs of gas (11 points) and electricity (7 points).

**Table 44** Retail Price Index fuel components, May 1996 to July 2012

| | Current fuel price indicies | | | | | |
|---|---|---|---|---|---|---|
| | Coal and smokeless fuel | Gas | Electricity | Heating oils | Fuel and light | Petrol and oil |
| **May-96** | 71.0 | 78.8 | 97.0 | 50.0 | 84.4 | 63.1 |
| **May-02** | 83.4 | 79.7 | 84.4 | 62.1 | 80.5 | 85.6 |
| **May-03** | 85.1 | 80.7 | 84.9 | 62.9 | 81.4 | 86.4 |
| **May-04** | 87.8 | 86.3 | 89.7 | 77.5 | 87.2 | 93.4 |
| **May-05** | 97.9 | 97.7 | 98.8 | 91.3 | 97.7 | 97.9 |
| **May-06** | 106.8 | 129.4 | 120.4 | 117.7 | 123.4 | 110.6 |
| **Jul-07** | 112.9 | 137.1 | 129.4 | 113.5 | 130.3 | 110.0 |
| **Jul-08** | 131.7 | 154.8 | 145.7 | 203.1 | 152.8 | 139.1 |
| **Jul-09** | 157.7 | 191.2 | 155.5 | 117.7 | 165.5 | 117.6 |
| **Jul-10** | 156.3 | 179.4 | 154.7 | 154.7 | 162.1 | 134.6 |
| **Jul-11** | 165.7 | 190.4 | 161.0 | 198.9 | 174.2 | 154.2 |
| **Oct-11** | 176.0 | 222.7 | 177.3 | 196.8 | 195.4 | 154.7 |
| **Jul-12** | 172.8 | 220.4 | 173.9 | 193.1 | 192.5 | 151.5 |
| **Percentage change Jul-10 to Jul-11** | 6.0% | 6.2% | 4.0% | 28.5% | 7.4% | 14.5% |
| **Percentage change Jul-10 to Oct-11** | 12.6% | 24.2% | 14.6% | 27.2% | 20.5% | 15.0% |
| **Percentage change Jul-11 to Jul-12** | 4.3% | 15.7% | 8.0% | -2.9% | 10.5% | -1.8% |

*Source: DECC QEP 2.1.3*[43]

[43] Quarterly Energy Prices: tables available at:
2.1.3 Retail prices index: fuel components, monthly figures
http://www.decc.gov.uk/en/content/cms/statistics/source/prices/prices.aspx

**Table 45** Retail Price Index fuel components relative to the GDP deflator, May 1996 to June 2012

| | Fuel price index numbers relative to the GDP deflator | | | | | | |
|---|---|---|---|---|---|---|---|
| | Coal and smokeless fuel | Gas | Electricity | Heating oils | Fuel and light | Petrol and oil | GDP Deflator |
| **May-96** | 84.8 | 94.1 | 115.9 | 59.7 | 100.9 | 75.4 | **83.7** |
| **May-02** | 89.7 | 85.8 | 90.8 | 66.9 | 86.7 | 92.2 | **92.9** |
| **May-03** | 89.4 | 84.8 | 89.2 | 66.1 | 85.5 | 90.7 | **95.2** |
| **May-04** | 90.2 | 88.7 | 92.2 | 79.7 | 89.7 | 96.0 | **97.3** |
| **May-05** | 98.1 | 97.9 | 99.0 | 91.5 | 97.9 | 98.1 | **99.8** |
| **May-06** | 104.4 | 126.5 | 117.7 | 115.1 | 120.6 | 108.1 | **102.3** |
| **Jul-07** | 107.2 | 130.2 | 122.9 | 107.8 | 123.7 | 104.5 | **105.3** |
| **Jul-08** | 121.6 | 142.9 | 134.5 | 187.5 | 141.0 | 128.4 | **108.3** |
| **Jul-09** | 143.4 | 173.8 | 141.4 | 107.0 | 150.4 | 107.0 | **110.0** |
| **Jul-10** | 138.5 | 158.9 | 137.0 | 137.1 | 143.6 | 119.2 | **112.9** |
| **Jul-11** | 143.1 | 164.5 | 139.0 | 171.8 | 150.4 | 133.1 | **115.8** |
| **Oct-11** | 150.9 | 191.0 | 152.1 | 168.8 | 167.6 | 132.7 | **116.6** |
| **Jun-12** | 145.5 | 186.0 | 146.7 | 159.7 | 162.2 | 128.3 | **118.5** |
| **Percentage change Jul-10 to Jul-11** | 3.3% | 3.5% | 1.5% | 25.3% | 4.7% | 11.7% | **2.6%** |
| **Percentage change Jul-10 to Oct-11** | 9.0% | 20.2% | 11.0% | 23.1% | 16.7% | 11.3% | **3.3%** |
| **Percentage change Jul-11 to Jul-12** | 1.7% | 13.1% | 5.5% | -7.0% | 7.8% | -3.6% | **2.3%** |

*Source: DEC QEP 2.1.3*

## 6.8 Fuel Poverty

184. The concept of fuel poverty used in this report is based on a theoretical calculation of how much it would cost to heat a dwelling according to a specified regime (See footnotes 16, 17 and 18). It does not utilise information on how much a household actually spends on fuel. In reality households may choose to heat their dwellings in a different manner to that assumed in the model.

## 6.9 The Tolerable Standard

185. The Tolerable Standard[44] is the minimum condition required by Scottish Law for a dwelling to be habitable. It was introduced in the 1969 Housing (Scotland) Act and was updated in the 1987, 2001 and 2006 Acts.

186. The Tolerable Standard definition was amended by the Housing (Scotland) Act 2006 to include additional criteria.[45] As the amendment was not implemented until April 2009 (3 months into the 2009 SHCS fieldwork period), the 2010 report presented the first results based on the amended standard.

A house meets the tolerable standard if it:

- is structurally stable;
- is substantially free from rising or penetrating damp;

[44] For further information see the SHCS 2002 National Report Technical Annex 7 at http://www.scotland.gov.uk/Topics/Statistics/SHCS/NationalReport2002

[45] Further details on The Housing (Scotland)Act 2006 amendments are available at http://www.opsi.gov.uk/legislation/scotland/acts2006/asp_20060001_en_2#pt1-ch3

- has satisfactory provision for natural and artificial lighting, for ventilation and for heating;
- has satisfactory thermal insulation;
- has an adequate piped supply of wholesome water available within the house;
- has a sink provided with a satisfactory supply of both hot and cold water within the house;
- has a water closet or waterless closet available for the exclusive use of the occupants of the house and suitably located within the house;
- has a fixed bath or shower and a wash-hand basin, each provided with a satisfactory supply of both hot and cold water and suitably located within the house;
- has an effective system for the drainage and disposal of foul and surface water;
- in the case of a house, has a supply of electricity that complies with the relevant requirements in relation to electrical installations for the purposes of that supply;
  - "the electrical installation" is the electrical wiring and associated components and fittings, but excludes equipment and appliances
  - "the relevant requirements" are that the electrical installation is adequate and safe to use
- has satisfactory facilities for the cooking of food within the house; and
- has satisfactory access to all external doors and outbuildings.

187. A failure to meet one or more of these criteria will result in a dwelling being declared Below Tolerable Standard (BTS). In such cases local authorities are required to act either through closure, demolition or improvement of the dwelling.

188. Most of these criteria have been part of the tolerable standard since its introduction in the 1969 Act. The 2001 Act added the bath / shower and wash-hand basin element. Waterless closets were added by administrative order in 2003. The 2006 Act introduces the most significant change to the criteria – the addition of thermal insulation and electrical installations, and also confirms the addition of waterless closets.

## 6.10 Disrepair

189. This report uses three different types of disrepair to describe the state of disrepair of a dwelling:

- **Any disrepair**: any disrepair, no matter how small, to any element of the dwelling;
- **Urgent disrepair**: any disrepair which if not rectified would cause the fabric of the building to deteriorate further and/or place the health and safety of the occupier at risk. Urgency of disrepair is only assessed for external and common elements;

- **Disrepair to critical elements**: any disrepair to the critical elements of the dwelling. The critical elements are those whose condition is central to a dwelling being wind and weather proof, structurally stable and safeguarded against further rapid deterioration. They are as follows:
  - Roof covering;
  - Roof structure;
  - Chimney stacks;
  - Flashings;
  - Roof gutters and downpipes;
  - External walls – finish;
  - External walls – structure;
  - Access decks and balustrades (common areas – flats only);
  - Foundations;
  - Damp-proof course;
  - External doors and windows (dwelling only);
  - Doors, screens, windows and roof lights (common areas – flats only);
  - Party walls – structure;
  - Floor structure;
  - Floor finish;
  - Dry rot/wet rot.
- **Extensive disrepair**: a score of 2 or more on the 10-point repair scale and/or a score of 'medium' or 'renew' on the 5-point repair scale or dry/wet rot in two or more rooms. Extensive disrepair is calculated in order to identify those dwellings where any disrepair present is of a relatively greater severity.

## 6.11 Urban Rural Classifications

190. The SHCS uses the 8-category Scottish Executive Urban/Rural Classification 2009-10[46]. The definitions of the 8 categories are in Table 46 below. When looking for different characteristics in urban and rural areas, it can be more useful to group the 8 categories into 2 gross urban and rural categories. This requires a definition of what constitutes urban and rural. The Scottish Government's core definition of rurality classifies settlements of less than 3,000 people as rural. The 8-category urban/rural classification can be collapsed to the core definition:

    - **Urban**: Large Urban Areas, Other Urban Areas, Accessible Small Towns, Remote Small Towns, Very Remote Small Towns i.e. categories 1 to 5;
    - **Rural**: Accessible Rural, Remote Rural, Very Remote Rural i.e. categories 6 to 8.

191. The full classification can be grouped in differing ways to meet user needs, for example a six category version can be used. In that version, 'Remote Small Towns' and 'Very Remote Small Towns' are grouped into 'Remote Small Towns'; and 'Remote Rural' and 'Very Remote Rural' are grouped into 'Remote Rural'. In this report any urban/rural breakdown uses the core definition of rurality outlined in the previous paragraph.

[46] More details can be found at: http://www.scotland.gov.uk/Topics/Statistics/About/Methodology/UrbanRuralClassification

**Table 46** Scottish Government 8 category Urban/Rural Classification 2009-2011

| Scottish Government Urban/Rural Classification | |
|---|---|
| **1 - Large Urban Areas** | Settlements of over 125,000 people. |
| **2 - Other Urban Areas** | Settlements of 10,000 to 125,000 people. |
| **3 - Accessible Small Towns** | Settlements of between 3,000 and 10,000 people, and within a 30 minute drive time of a Settlement of 10,000 or more. |
| **4 - Remote Small Towns** | Settlements of between 3,000 and 10,000 people, and with a drive time between 30 and 60 minutes to a Settlement of 10,000 or more. |
| **5 - Very Remote Small Towns** | Settlements of between 3,000 and 10,000 people, and with a drive time of over 60 minutes to a Settlement of 10,000 or more. |
| **6 - Accessible Rural Areas** | Areas with a population of less than 3,000 people, and within a drive time of 30 minutes to a Settlement of 10,000 or more. |
| **7 - Remote Rural Areas** | Areas with a population of less than 3,000 people, and with a drive time of between 30 and 60 minutes to a Settlement of 10,000 or more. |
| **8 - Very Remote Rural Areas** | Areas with a population of less than 3,000 people, and with a drive time of over 60 minutes to a Settlement of 10,000 or more. |

## 6.12 Carbon Dioxide Emissions

192. The estimate of carbon emissions in the SHCS is based on the NHER methodology and is calculated from the theoretical energy used in maintaining the standard regime for a standard level of occupancy, derived from knowledge of the appliances, fuel source, insulation, size and dwelling type of the premises.

# Annex A Assessing Contributions to Changes in Fuel Poverty

193. Between 2010 and 2011 there was a reduction in the rate of fuel poverty of 3.4 percentage points taking July 2011 fuel prices, or a small increase of 0.9 percentage points using October 2011 fuel prices.

194. During this period the price of fuel increased putting upward pressure on the rate of fuel poverty. The growth of household income and the improvements in the energy efficiency of the housing stock which are evident in our SHCS samples work in the opposite direction. To simulate the effect of fuel price alone we substituted 2011 fuel prices in data from the 2010 SHCS sample, effectively holding housing stock characteristics and household incomes at their 2010 levels while increasing the cost of fuel. The resulting predicted levels of fuel poverty are reported in the third row of Table 47 for July 2011 and October 2011, at 28.8 and 32.6 percent.

**Table 47** Components of fuel poverty change: price, income and energy efficiency

| | **Fuel price** | | |
|---|---|---|---|
| | *Jul-11* | *Oct-11* | |
| Observed fuel poverty rate (2011) | 24.6% | 28.9% | |
| *Observed change from 2010* | *-3.4%* | *0.9%* | |
| Predicted fuel poverty rates due to fuel price increase | 28.8% | 32.6% | |
| Difference due to income and energy efficiency upgrades | -4.2% | -3.7% | |
| ***Of which:*** | | | ***Share*** |
| *Effect of income* | -2.5% | -2.2% | 60.3% |
| *Effect of housing stock changes* | -1.7% | -1.5% | 39.7% |

*Source: SHCS 2010-11*

195. These figures constitute estimates of the effect of fuel price rises on the observed level of fuel poverty (reported in of Table 47). [47] The rates of fuel poverty observed in 2011 are lower than those predicted by fuel price alone, presumably due to increases in household income and energy efficiency. This difference, or the offsetting effect of income and energy efficiency taken together, stands between 3.7 and 4.2 percentage points depending on the fuel price used (row 4 in Table 47).

196. To disaggregate this further we simulate the change in each income and housing stock between 2010 and 2011 while keeping other factors constant and take the resulting changes in the predicted fuel poverty rates as estimates of the effect of income and housing stock respectively.

[47] Rates of fuel poverty are of course not directly observed. They are estimated from data on household income, housing characteristics and fuel prices assuming a given energy consumption regime. We use the terms 'observed' and 'predicted' here to differentiate between these estimates which are based on actual data and estimates where data about at least one set of factors have been simulated.

197. To simulate income growth between 2010 and 2011 we upgraded 2010 household incomes to 2011 levels by increasing each household's income by the average income gain which was experienced in their decile (see Table 25).

198. Energy efficiency upgrades are more difficult to simulate because of the broad range of improvements and the complex nature of the interactions that influence the thermal performance of buildings. To model energy efficiency changes in isolation we used the 2011 SHCS sample of the housing stock with simulated 2010 income levels and 2010 fuel prices. The difference between the estimate of fuel poverty obtained in this way and the observed 2010 fuel poverty estimate is due to the differences in the housing stock observed between the 2010 and the 2011 SHCS samples, which includes the energy efficiency improvements in housing discussed in the rest of this report. It can therefore be taken as an estimate of the impact that improvements in the energy efficiency of housing have on containing the pressure from the rising fuel price[48].

199. The results are reported in rows 5 and 6 of Table 47 in terms of percentage point change in the estimated fuel poverty rate (columns 1 and 2) and as share of the overall offsetting influence on the price effect (column 3).

[48] We experimented with an alternative method which took the residual from removing the income effect from the joint offsetting effect of income and stock. This gave a slightly lower figure which is to be expected given this method is more conservative in terms of the estimate of the role of housing characteristics and energy efficiency in particular, because where households potentially benefit from both income growth and energy efficiency improvements to move out of fuel poverty, these benefits are already accounted for by income.

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