



Scottish  
**House Condition**  
Survey

## Scottish House Condition Survey

# Energy efficiency and estimated emissions from the Scottish housing stock - 2003/04



SCOTTISH EXECUTIVE

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## Introduction

1. The Scottish House Condition survey (SHCS) is the only national survey of housing in Scotland. It combines an interview with the household with a physical inspection of its dwelling, to build a picture of Scotland's housing stock. It covers all types of dwellings, whether owned or rented, flats or houses, across the entire country
2. In 2003 the SHCS moved to a 'continuous' format. Previous surveys were conducted in 1991, 1996 and 2002 and typically covered a sample of around 15,000 paired household interviews and physical surveys of the dwellings
3. The continuous format was introduced to allow more flexibility of content, to assist in the monitoring of Ministerial targets and to ease the management burden. The 2003/04 survey gathered data from almost 4,000 households and dwellings with paired social and physical data available for around 3,000 of these. The results in this report are based on fieldwork from October 2003 to September 2004.

## Background

4. The Home Energy Conservation Act 1995 (HECA) became law in Scotland in 1996. This Act designated all Scottish local authorities as energy conservation authorities, each with a duty to devise strategies to achieve significant improvements in the energy efficiency of their respective housing stocks, across all tenures, over the ensuing 10 years.
5. All Scottish local authorities published their initial HECA strategies in 1997. They were used as the basis of agreeing individual target improvements in energy efficiency between each local authority and The Scottish Office (now, the Scottish Executive). These targets, which take account of local circumstances and conditions, range from less than 20% to more than 30%.
6. The Scottish House Condition Survey has been used to examine the emissions from dwellings and the closely related energy efficiency of different types of dwelling and households across Scotland. A brief overview of the methods for determining emissions and energy efficiency is given in paragraphs 38 to 42. More information about the models is available from the National Energy Centre<sup>1</sup>.
7. Note that the methodology used is not intended to provide figures for actual energy usage and the associated level of emissions. Instead it allows a comparison of levels of emissions of carbon dioxide, sulphurous oxides and nitrogen oxides across different sectors of the Scottish housing stock, based on calculations of the level of energy use required to maintain a standard heating regime. It can therefore be used to compare the energy efficiency of the housing stock over time.

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<sup>1</sup> <http://www.nher.co.uk/>

8. In reality, households may choose to heat their homes to a higher or lower level than the “typical” level that is assumed. Information on carbon dioxide emissions from the domestic energy sector, based on fuel used, are published by the Department for Environment, Food and Rural Affairs (Defra)<sup>2</sup>.
9. This report considers emissions of three different gases or groups of gases. The contribution of carbon dioxide (CO<sub>2</sub>) emissions to global warming is well documented. Sulphurous oxides (SO<sub>2</sub> and SO<sub>3</sub>) are air pollutants, and are significant agents in the production of acid rain. Nitrogen oxides (NO, NO<sub>2</sub>, N<sub>2</sub>O, N<sub>2</sub>O<sub>3</sub>, N<sub>2</sub>O<sub>4</sub> and N<sub>2</sub>O<sub>5</sub>) are a group of gases which contribute to pollution in a number of ways. Nitrous oxide (N<sub>2</sub>O) is another gas targeted in attempts to curb greenhouse gas emissions. The other nitrogen oxides contribute to acid rain and smog, and are believed to aggravate asthmatic conditions.
10. The figures in the text are estimates based on the mean survey value. More properly, they should be quoted with 95% confidence intervals which factor in the design effects due to over-sampling in some council areas. The interpretation of these figures are considered more fully in paragraphs 35 to 37 below.

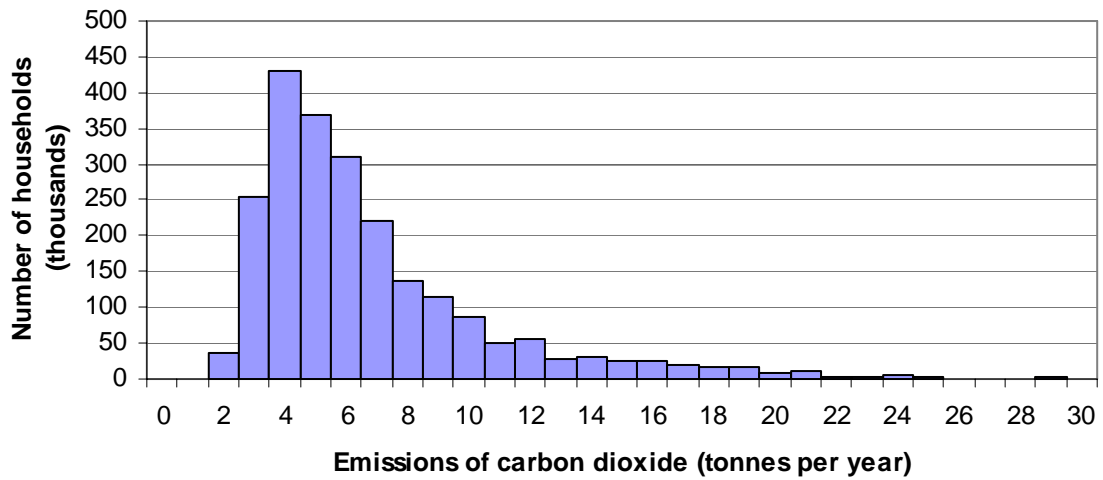
## Emissions of carbon dioxide

11. The model used for the calculation of emissions predicts that around 15.7 million tonnes of carbon dioxide were released from domestic energy use in Scotland in 2003/04, an average of 7 tonnes per household, and a reduction of 12% on the 1996 baseline figure of 17.8 million tonnes. Note that this figure is based on a theoretical model, as described in paragraphs 38 to 42, and does not represent the actual level of emissions of carbon dioxide from the domestic sector. It is provided here only to demonstrate the change in the level of emissions due to improvements in the energy efficiency of dwellings and the use of cleaner fuels over the same period. In reality, many households may have the same level of fuel consumption as in 1996, but improvements in energy efficiency allow them to heat their home to a higher level. Carbon dioxide emissions from household energy use for the whole of Scotland are published by Defra<sup>2</sup>.
12. Figure 1 and Table 1 show the distribution of carbon dioxide emissions across all households, as estimated from the SHCS. This distribution is skewed, with around two thirds of households emitting less than the average amount.
13. An average of 4 to 5 tonnes per year were released from dwellings rented in the social sector in 2003/04, compared to 8 tonnes per year from owner-occupied dwellings and dwellings rented in the private sector. Figure 2 shows how levels have fallen across all tenures since 1996.

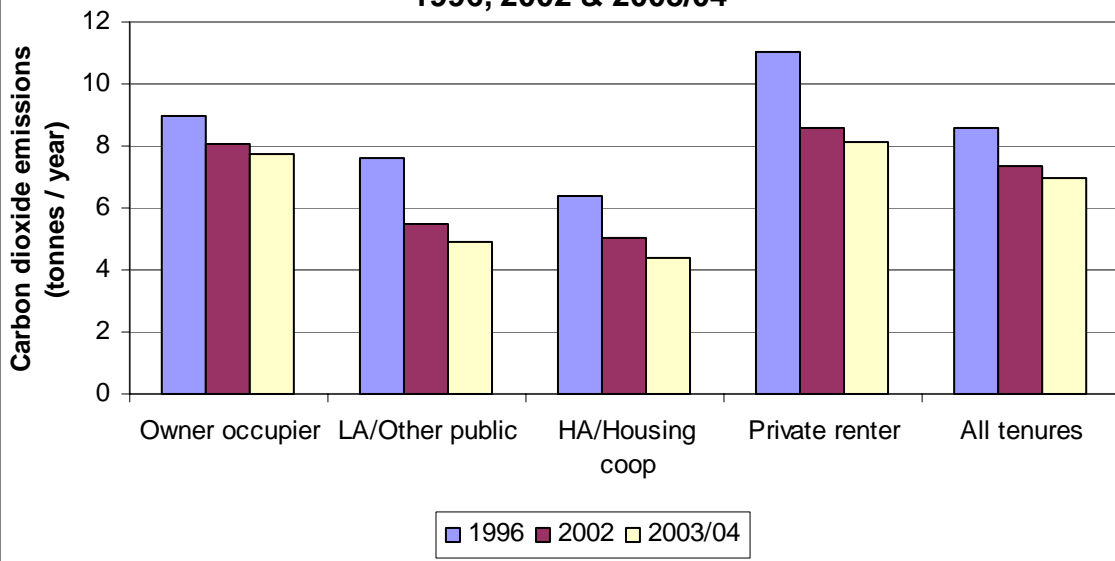
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<sup>2</sup> <http://www.defra.gov.uk/environment/statistics/globalatmos/globalghg.htm> for 2004 figures of carbon dioxide emissions by region for the domestic and other sectors.

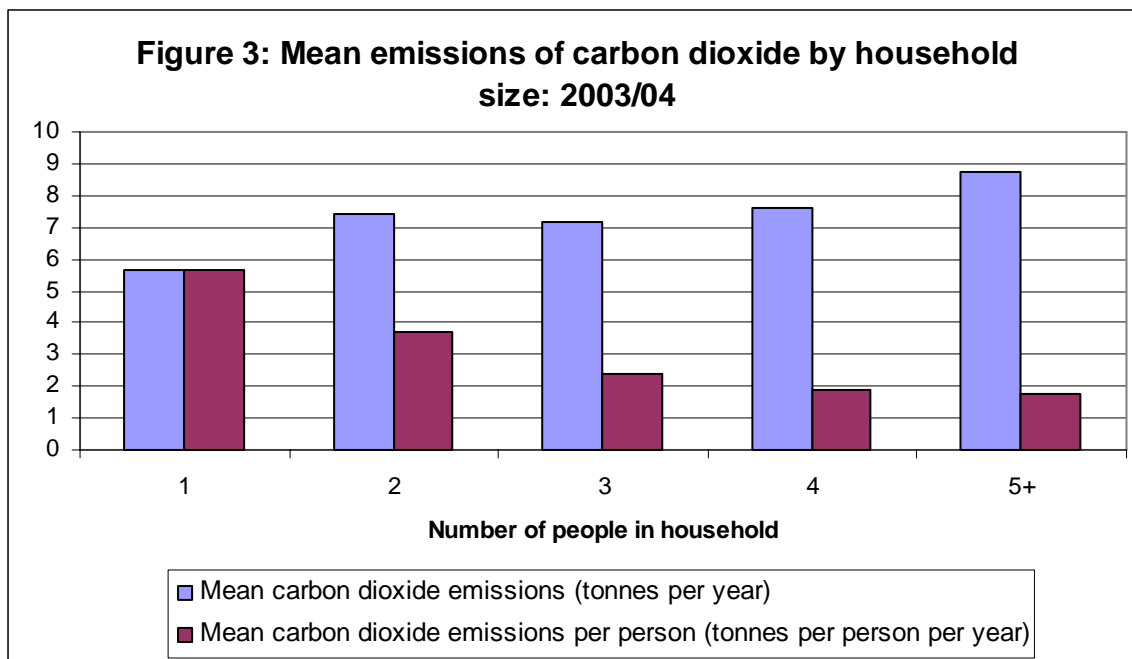
**Figure 1: Emissions of Carbon dioxide from domestic energy use: 2003/04**



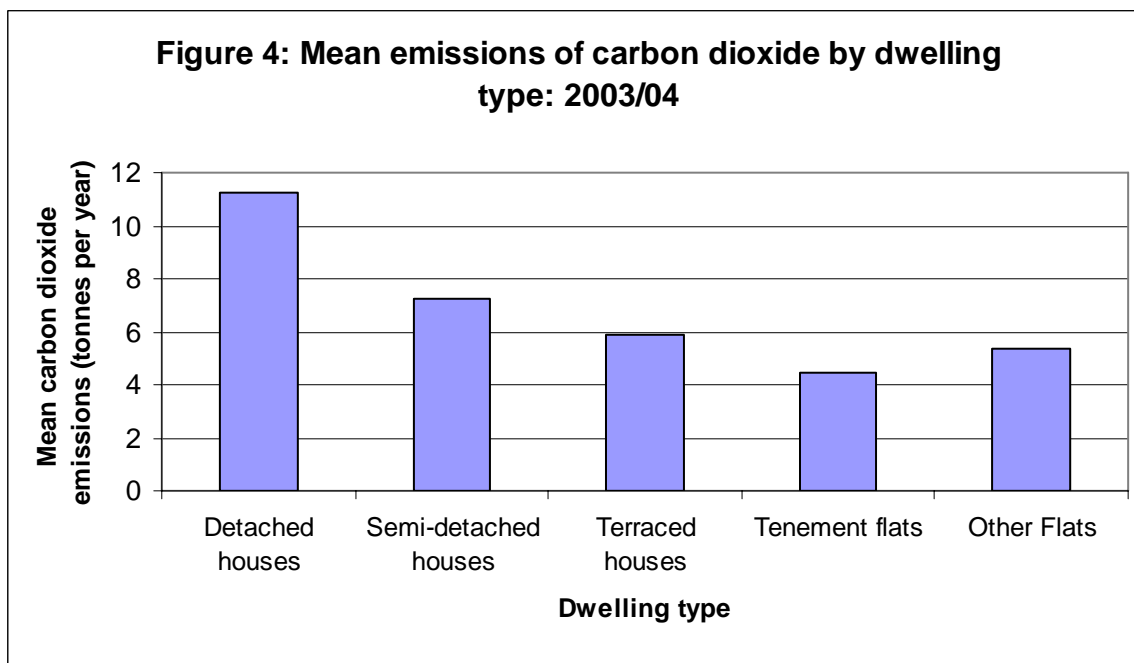
**Figure 2: Mean emissions of carbon dioxide by tenure: 1996, 2002 & 2003/04**



14. Although larger households produce a larger amount of carbon dioxide emissions (an average of 7 to 9 tonnes per year for households containing more than one adult, compared to 5 to 6 tonnes per year for single person and single parent households), Figure 3 demonstrates that there is a clear saving in emissions in living together when emissions per person are taken into account.



15. Detached dwellings and older dwellings (pre-1919) emit much higher quantities of carbon dioxide than other dwelling types. Households with above average incomes also produce more emissions, because they are more likely to live in larger houses. Figure 4 shows that those living in flats produce, on average, less than half the emissions of those living in detached houses.



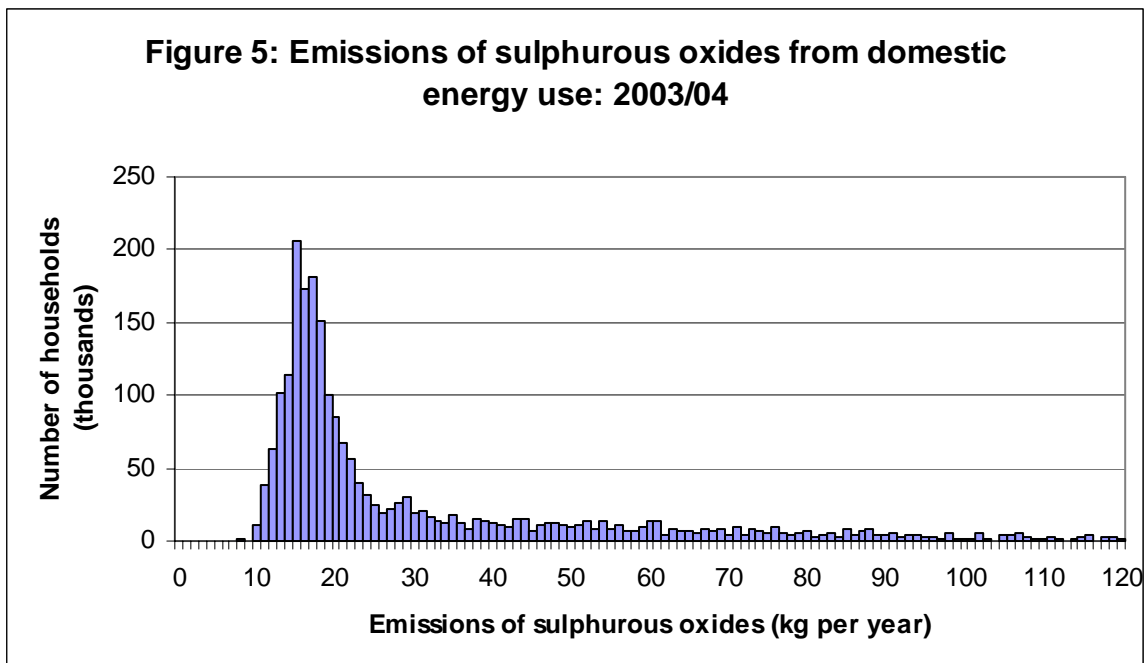
16. Households with central heating systems which run on fuel other than gas or electricity (e.g. oil-powered systems) produce almost twice as much carbon dioxide as households with gas or electric central heating. This, however, is slightly misleading, as Table 5 shows that more carbon dioxide is produced per unit of energy delivered in the use of electricity than any of the other main

fuels. The reason for this apparent anomaly is that electric central heating is a common feature of small flats, whereas oil and LPG are more likely to be used for heating large detached houses.

17. The level of emissions per unit of energy delivered for electricity use is based on emissions created during the generation and distribution of electricity fed into the UK national grid.

## Emissions of sulphurous oxides

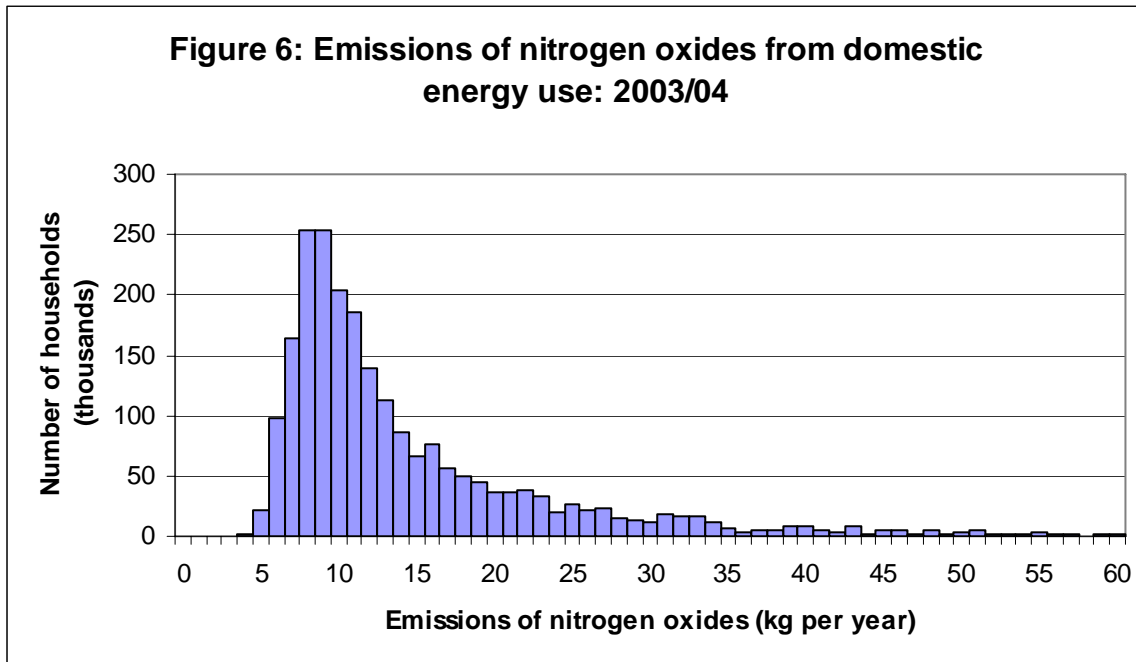
18. Around 80 thousand tonnes of sulphurous oxides were released from the heating of homes in Scotland in the 12 month period from October 2003 to September 2004, an average of 35 kg per household. Again this is an estimate based on modelled expenditure on fuel. No baseline figure was calculated for SO<sub>x</sub> emissions from the 1996 survey, and the 2003/04 figure shows no significant change from the 2002 figure of 34kg per household. The distribution of emissions in 2003/04 is shown in Figure 5 and Table 2.



19. Table 2 shows that private rented dwellings, detached dwellings and older dwellings all produce higher quantities of emissions of sulphurous oxides than other dwelling types.
20. Households with gas central heating systems produce on average less than a quarter of the emissions of sulphurous oxides of households with electric central heating. As noted in paragraph 17, the reason for the high level of emissions of sulphurous oxides and other gases considered in this report from electric central heating is to do with the assumptions made about the generation and distribution of electricity throughout the United Kingdom.

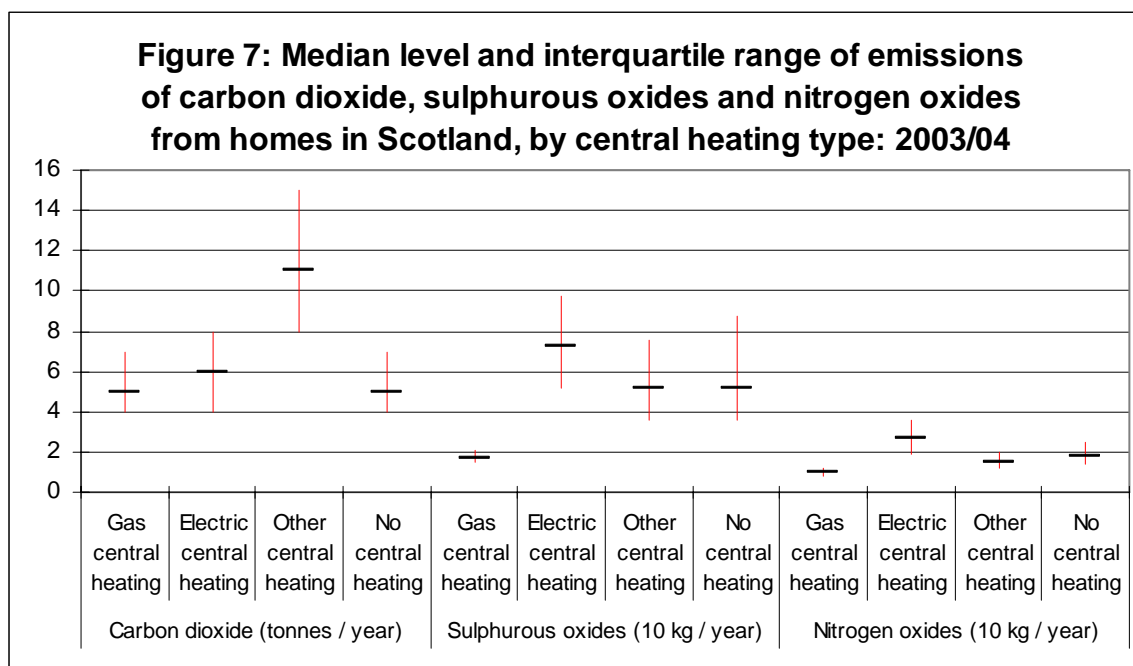
## Emissions of nitrogen oxides

21. Around 34 thousand tonnes of nitrogen oxides were released in the year from October 2003 to September 2004 from the heating of homes in Scotland, an average of 15 kg per household.
22. Figure 6 shows the distribution of emissions of nitrogen oxides in 2003/04. It shows the same pattern as the CO<sub>2</sub> and SO<sub>x</sub> distributions, with around two thirds of households producing less than the average amount of emissions.



23. Again, private-rented and owner-occupied dwellings, detached dwellings and older dwellings all produce higher quantities of emissions of nitrogen oxides than other dwelling types.
24. Households with gas central heating systems produce on average about a third of the emissions of nitrogen oxides of households with electric central heating, and just over half of the emissions of nitrogen oxides of households without central heating.
25. Figure 7 shows the median level and interquartile range of emissions of carbon dioxide, sulphurous oxides and nitrogen oxides from homes in Scotland. Note the different scale used for carbon dioxide emissions as for the other types of emission. The purpose of this graph is not to compare the different types of emission, but to show the variation in emissions across the different types of domestic heating.
26. Dwellings with electric central heating produce a relatively high amount of emissions of sulphurous and nitrogen oxides, but a lower level of carbon dioxide emissions, compared to dwellings with central heating powered by fuels other than gas or electricity. Gas central heating produces relatively low

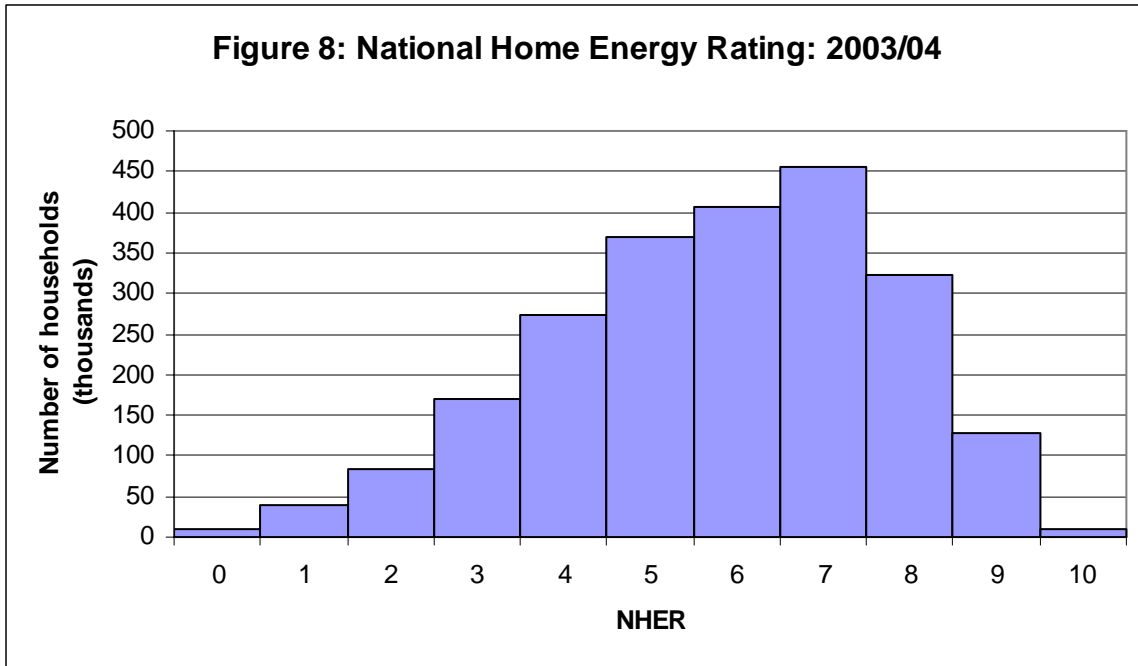
levels of all three types of emission. Note that the graph shows the median, and not the mean level of emissions.



27. Table 5 shows the calculated emissions for each fuel type per gigajoule of delivered energy. This shows a slightly different story, with electricity producing a higher level of carbon dioxide emissions than any of the other fuels. This difference can be explained by the fact that the average dwelling size is larger for dwellings with central heating powered by coal or oil than for dwellings with electric central heating systems.

## National Home Energy Rating profile

28. Around 6 per cent of dwellings in Scotland were rated “poor” in terms of energy efficiency using the National Home Energy Ratings (NHER), down from 8% in 2002. 40 per cent were rated “good”, compared to 31% in 2002. Figure 8 shows the number of households in Scotland living in homes rated in each of the NHER levels. Levels 0 to 2 are considered “poor”, 3 to 6 “moderate” and 7 to 10 “good” in terms of energy efficiency. Paragraphs 38 to 40 provide a brief overview of how the NHER of a dwelling is determined.
29. Table 4 shows that owner-occupied and private rented dwellings have a lower average rating than social rented dwellings.
30. Detached houses naturally have a lower NHER rating than other types of dwelling, because of the higher proportion of wall area exposed to the outside.
31. Dwellings built since 1982 have a higher average rating than older dwellings, with 71 per cent of such dwellings achieving a “good” rating, compared to just 19 per cent of dwellings built before 1919.



32. 49 per cent of dwellings with gas central heating achieved a “good” rating, compared to 27 per cent with electric central heating, and only 3-4 per cent of dwellings with no central heating or other forms of central heating.

## Notes on the tables

33. The emissions tables each present the mean (average) value for the weight of emissions and the median value (a more “typical” value, below which the actual value for exactly half the dwellings falls). In all of the figures presented, the median is less than the mean. This is because the distribution is skewed because some dwellings produce a large amount of emissions.
34. These tables also present the lower decile (below which the value for 10% of the dwellings falls), the lower quartile (below which the value for 25% of the dwellings falls), the upper quartile (above which the value for 25% of the dwellings falls) and the upper decile (above which the value for 10% of the dwellings falls). This gives a broad picture of the distribution of the sample.
35. Although the SHCS sample is chosen at random, the selected households will not necessarily be representative of the population. For example, purely by chance, the sample could include disproportionate numbers of certain types of people or dwelling. In general, the smaller the sample size, the greater the likelihood that the estimate could be misleading.
36. The ‘paired’ (social and physical survey) overall response rate to the survey is about 60%, i.e. for every two households that agree to take part, one household either refuses or is not contactable. The survey is reweighted for such non-response but we cannot know authoritatively how the missed population differs from the compliant population.

37. While the extent of bias due to non-response cannot be quantified, the likely extent of sampling variability can be quantified, 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 one in twenty chance that the true value would not fall within the range given by the confidence interval. Each of the tables present a 95% confidence interval for the estimated means.
38. The National Home Energy Rating (NHER) is the most commonly used standard for calculating the energy efficiency of dwellings in Scotland<sup>3</sup>. The NHER assessment generates an energy rating for a dwelling on a scale of 0 (poor) to 10 (excellent), based on the total energy costs per square metre of floor area required to achieve a standard heating regime.
39. The assessment procedure is not, therefore, based on what the household actually spends to maintain the heating regime of its choice, but on the theoretical costs of maintaining a standard regime for a standard level of occupancy, derived from knowledge of the appliances, fuel source, insulation, size and dwelling type of the premises.
40. NHER energy costs, from the model produced by the National Energy Services<sup>4</sup>, include costs for space and water heating, lighting, domestic appliances (e.g. washing machine) and standing charges. The model also includes a factor for local climate variations, to take account the differences across the United Kingdom.
41. Figures for emissions of carbon dioxide, nitrogen oxides and sulphurous oxides are calculated from the same model. CO<sub>2</sub> emissions are calculated at a standard rate of 54 kg per GJ of mains gas and 142 kg per GJ of mains electricity. The level for electricity is based on average emissions from all types of power station across the United Kingdom. Table 5 gives details of the level of emissions per gigajoule<sup>5</sup> (GJ) for all fuel types, as provided by the Building Research Establishment<sup>6</sup>. Note that a certain amount of electricity use is assumed for all dwellings, irrespective of the fuel used for space and water heating. This covers lighting and domestic appliances, as well as any pumps and fans used in the distribution of heating around the dwelling.
42. Emissions are higher where there is a person aged 60 or above, or a person who has self-reported as long-term sick or disabled in the household, as a different heating regime is assumed. The assumed level of fuel use for such households is in order to continuously heat the home for 16 hours per day, to a temperature of 23 degrees Celsius in the living room and 18 degrees in other rooms. For other households, the assumed level is in order to heat the home for 9 hours per day (2 in the morning and 7 in the evening) on a weekday, and 16 hours at a weekend, to a temperature of 21 degrees Celsius

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<sup>3</sup> For more information see <http://www.nher.co.uk/>

<sup>4</sup> <http://www.nesltd.co.uk>

<sup>5</sup> 1 gigajoule = 277.778 kilowatt hours

<sup>6</sup> <http://www.bre.co.uk>

in the living room and 18 degrees in other rooms. Actual fuel use does not form part of the calculations.

**Table 1: Emissions of carbon dioxide from dwellings in Scotland: October 2003-September 2004**  
**Weight of emissions per dwelling per year**

	Lower decile (tonnes / year)	Lower quartile (tonnes / year)	Median (tonnes / year)	Upper quartile (tonnes / year)	Upper decile (tonnes / year)	Mean (tonnes / year)	95% Confidence Interval for mean		Sample size
						Lower bound	Upper bound		
<b>All dwellings</b>	3	4	6	8	12	6.9	6.8	7.1	3,090
<b>by tenure</b>									
Owner-occupier	4	5	6	9	14	7.7	7.5	8.0	2,016
LA/other public	3	4	5	6	7	4.9	4.8	5.1	612
HA/co-op	3	3	4	5	7	4.4	4.2	4.6	258
Private-rented	3	4	6	9	16	8.2	7.1	9.2	204
<b>by household type</b>									
Single adult	3	3	4	6	10	5.6	5.2	6.0	418
Small adult	3	4	6	9	14	7.4	6.9	7.9	550
Single parent	3	4	5	6	8	5.1	4.8	5.5	182
Small family	4	5	6	9	12	7.4	7.0	7.8	429
Large family	4	5	7	10	16	8.8	8.1	9.5	229
Large adult	4	5	6	8	14	7.7	7.2	8.2	320
Older smaller	4	5	6	10	13	7.8	7.4	8.3	500
Single pensioner	3	4	5	7	9	5.6	5.3	6.0	462
<b>by banded weekly income</b>									
< £100	3	4	5	8	12	6.8	6.1	7.6	188
£100-£200	3	4	5	7	10	5.9	5.6	6.2	622
£200-£300	3	4	5	7	10	6.1	5.8	6.4	606
£300-£400	3	4	5	7	11	6.5	6.1	6.9	429
£400-£500	3	4	6	8	11	6.9	6.5	7.4	365
£500-£700	4	5	7	9	14	7.8	7.4	8.2	426
£700 +	5	6	9	13	18	10.8	10.0	11.6	309
<b>by type of dwelling</b>									
Detached houses	6	7	9	14	19	11.2	10.7	11.7	760
Semi-detached houses	4	5	6	9	11	7.2	7.0	7.5	696
Terraced houses	4	4	5	7	9	5.9	5.7	6.0	734
Tenement flats	3	3	4	5	7	4.5	4.3	4.7	516
Other Flats	3	4	4	6	8	5.3	5.0	5.7	384
<b>by age of dwelling</b>									
Pre-1919	4	5	8	13	18	10.2	9.5	10.8	555
1919-1944	4	4	6	9	12	7.2	6.8	7.6	414
1945-1964	3	4	5	7	10	6.1	5.9	6.3	742
1965-1982	3	4	6	7	10	6.3	6.1	6.6	843
Post-1982	3	4	5	7	9	5.5	5.3	5.7	536
<b>by central heating and fuel type</b>									
Gas central heating	3	4	5	7	11	6.5	6.3	6.6	2,093
Electric central heating	3	4	6	8	11	6.6	6.2	7.0	561
Other central heating	7	8	11	15	20	12.7	11.8	13.5	314
No central heating	3	4	5	7	12	6.9	5.7	8.0	122

**Table 2: Emissions of sulphurous oxides from dwellings in Scotland: October 2003-September 2004**  
**Weight of emissions per dwelling per year**

	Lower decile	Lower quartile	Median	Upper quartile	Upper decile	Mean	95% Confidence Interval for mean		Sample size
	(kg / year)	(kg / year)	(kg / year)	(kg / year)	(kg / year)	(kg / year)	Lower bound	Upper bound	
<b>All dwellings</b>	14	16	19	40	77	35.1	33.8	36.5	3,090
<b>by tenure</b>									
Owner-occupier	14	16	20	35	73	34.9	33.1	36.7	2,016
LA/other public	13	14	17	48	78	31.8	29.5	34.2	612
HA/co-op	13	15	19	50	71	33.6	30.4	36.8	258
Private-rented	13	15	27	63	108	48.3	41.1	55.4	204
<b>by household type</b>									
Single adult	12	14	18	44	70	33.1	30.3	35.9	418
Small adult	13	16	20	38	76	36.5	32.6	40.4	550
Single parent	14	15	17	43	84	33.7	28.7	38.6	182
Small family	15	16	20	30	67	31.0	28.4	33.7	429
Large family	16	17	22	47	91	41.2	35.5	47.0	229
Large adult	15	17	19	31	63	31.4	28.1	34.7	320
Older smaller	14	16	20	43	92	39.7	35.4	44.0	500
Single pensioner	13	15	18	48	77	35.1	31.7	38.5	462
<b>by banded weekly income</b>									
< £100	13	15	18	39	81	40.4	31.6	49.2	188
£100-£200	13	15	18	50	86	37.4	34.4	40.4	622
£200-£300	13	16	18	43	79	34.4	31.7	37.1	606
£300-£400	14	15	19	34	74	32.5	29.4	35.7	429
£400-£500	14	16	19	28	63	29.8	26.4	33.1	365
£500-£700	15	16	20	31	68	33.2	29.8	36.7	426
£700 +	16	20	27	40	68	41.8	36.1	47.5	309
<b>by type of dwelling</b>									
Detached houses	18	21	28	47	106	48.0	43.7	52.2	760
Semi-detached houses	15	16	19	28	86	33.9	31.1	36.6	696
Terraced houses	14	16	18	27	77	30.4	28.4	32.4	734
Tenement flats	12	14	17	44	64	30.6	28.4	32.9	516
Other Flats	13	14	17	45	72	31.9	29.1	34.6	384
<b>by age of dwelling</b>									
Pre-1919	14	17	31	55	106	49.2	44.1	54.3	555
1919-1944	13	15	17	22	67	28.4	25.3	31.6	414
1945-1964	14	15	18	34	81	32.9	30.6	35.2	742
1965-1982	14	16	20	43	79	34.8	32.5	37.0	843
Post-1982	13	16	21	35	58	29.6	27.6	31.7	536
<b>by central heating and fuel type</b>									
Gas central heating	13	15	17	21	29	19.8	19.4	20.2	2,093
Electric central heating	42	52	73	97	138	84.6	79.9	89.3	561
Other central heating	29	36	52	76	109	65.1	59.7	70.4	314
No central heating	29	36	52	87	129	68.5	59.2	77.8	122

**Table 3: Emissions of nitrogen oxides from dwellings in Scotland: October 2003-September 2004**  
**Weight of emissions per dwelling per year**

	Lower decile	Lower quartile	Median	Upper quartile	Upper decile	Mean	95% Confidence Interval for mean		Sample size
	(kg / year)	(kg / year)	(kg / year)	(kg / year)	(kg / year)	(kg / year)	Lower bound	Upper bound	
<b>All dwellings</b>	7	9	11	17	27	15.1	14.7	15.6	3,090
<b>by tenure</b>									
Owner-occupier	8	9	12	17	27	15.8	15.2	16.3	2,016
LA/other public	7	8	9	13	27	12.9	12.2	13.7	612
HA/co-op	6	7	10	18	26	13.7	12.6	14.7	258
Private-rented	7	9	13	21	31	16.9	15.1	18.7	204
<b>by household type</b>									
Single adult	6	8	11	16	25	13.7	12.8	14.6	418
Small adult	7	8	11	17	26	15.4	14.2	16.6	550
Single parent	7	8	9	16	31	14.1	12.5	15.8	182
Small family	8	9	12	16	25	14.3	13.5	15.1	429
Large family	9	9	13	20	33	17.4	15.7	19.1	229
Large adult	8	10	11	16	25	14.9	13.8	15.9	320
Older smaller	8	9	12	19	33	17.1	15.7	18.5	500
Single pensioner	6	8	11	18	28	14.7	13.6	15.7	462
<b>by banded weekly income</b>									
< £100	7	8	11	19	29	16.6	13.8	19.4	188
£100-£200	7	8	10	18	29	15.0	14.1	15.9	622
£200-£300	7	8	11	17	27	14.6	13.7	15.4	606
£300-£400	7	9	10	15	24	13.9	12.9	14.8	429
£400-£500	7	9	11	15	23	13.5	12.6	14.4	365
£500-£700	8	9	12	17	26	15.5	14.3	16.6	426
£700 +	9	12	15	21	31	19.4	17.6	21.2	309
<b>by type of dwelling</b>									
Detached houses	10	12	15	21	33	20.3	19.0	21.5	760
Semi-detached houses	8	9	11	15	29	15.2	14.3	16.1	696
Terraced houses	8	9	10	13	27	13.2	12.6	13.9	734
Tenement flats	6	7	9	16	23	12.8	12.1	13.6	516
Other Flats	7	8	9	18	26	13.8	12.8	14.7	384
<b>by age of dwelling</b>									
Pre-1919	7	10	15	22	34	19.6	18.1	21.1	555
1919-1944	7	8	10	15	25	13.6	12.6	14.6	414
1945-1964	7	9	11	15	28	14.2	13.5	14.9	742
1965-1982	8	9	11	18	29	15.1	14.3	15.8	843
Post-1982	6	8	11	16	22	13.2	12.5	13.9	536
<b>by central heating and fuel type</b>									
Gas central heating	7	8	10	12	17	11.2	10.9	11.4	2,093
Electric central heating	16	19	27	36	50	30.9	29.3	32.6	561
Other central heating	10	12	15	20	26	17.9	16.7	19.2	314
No central heating	12	14	18	25	37	21.6	19.5	23.7	122

**Table 4: National Home Energy Rating of dwellings in Scotland: October 2003 - September 2004**  
**Percentage of dwellings rated at each level, and mean energy rating**

	Poor			Moderate				Good				All	Mean	95% Confidence Interval for mean		Sample size
	0	1	2	3	4	5	6	7	8	9	10			Lower bound	Upper bound	
<b>All dwellings</b>	0	2	4	7	12	16	18	20	14	6	0	100	5.8	5.7	5.9	3,090
<b>by tenure</b>	<i>Row percentages</i>															
Owner-occupier	0	2	5	8	14	18	18	19	12	3	0	100	5.6	5.5	5.6	2,016
LA/other public	0	0	1	5	6	14	20	25	20	8	0	100	6.4	6.3	6.6	612
HA/co-op	0	1	2	7	8	9	13	20	23	16	2	100	6.6	6.4	6.9	258
Private-rented	3	4	6	15	16	14	12	15	8	7	1	100	5.1	4.8	5.4	204
<b>by household type</b>																
Single adult	1	2	5	7	13	16	15	17	15	9	0	100	5.8	5.6	6.0	418
Small adult	1	1	6	7	12	17	16	18	15	7	1	100	5.8	5.6	6.0	550
Single parent	0	2	1	5	8	13	19	21	22	10	0	100	6.4	6.1	6.6	182
Small family	1	2	2	5	10	18	20	28	13	3	0	100	5.9	5.7	6.1	429
Large family	0	3	5	8	9	16	22	22	12	2	0	100	5.7	5.4	5.9	229
Large adult	0	1	2	8	15	17	20	21	13	3	0	100	5.7	5.5	5.9	320
Older smaller	0	2	5	11	16	17	15	15	13	5	1	100	5.4	5.3	5.6	500
Single pensioner	0	2	3	7	10	15	19	21	15	5	1	100	5.9	5.7	6.1	462
<b>by banded weekly income</b>																
< £100	0	1	5	8	13	18	14	20	16	5	0	100	5.8	5.5	6.0	188
£100-£200	0	2	4	8	11	14	17	22	15	6	1	100	5.9	5.7	6.0	622
£200-£300	1	2	4	7	10	15	16	19	17	8	1	100	5.9	5.7	6.1	606
£300-£400	1	2	4	6	11	17	16	22	13	6	0	100	5.8	5.6	6.0	429
£400-£500	0	1	3	7	15	15	22	19	12	5	0	100	5.8	5.6	5.9	365
£500-£700	0	2	3	6	14	19	20	20	13	3	0	100	5.7	5.5	5.9	426
£700 +	1	2	3	10	15	20	20	17	8	3	0	100	5.3	5.1	5.5	309
<b>by type of dwelling</b>																
Detached houses	1	4	8	13	19	15	16	18	7	0	0	100	4.9	4.7	5.0	760
Semi-detached houses	0	1	3	9	15	23	20	18	9	0	0	100	5.4	5.2	5.5	696
Terraced houses	0	1	2	6	8	18	20	22	20	5	0	100	6.1	6.0	6.3	734
Tenement flats	1	1	3	4	7	11	15	20	19	16	2	100	6.6	6.4	6.8	516
Other Flats	0	2	3	6	10	13	18	24	16	8	0	100	6.1	5.9	6.3	384
<b>by age of dwelling</b>																
Pre-1919	2	6	9	13	16	20	15	13	5	1	0	100	4.6	4.4	4.7	555
1919-1944	1	1	4	7	18	20	18	19	11	2	0	100	5.5	5.3	5.7	414
1945-1964	0	1	3	8	12	18	20	20	13	5	0	100	5.8	5.7	5.9	742
1965-1982	0	1	2	8	12	16	20	20	14	6	0	100	5.9	5.8	6.0	843
Post-1982	0	0	2	1	4	8	15	28	27	14	2	100	7.1	6.9	7.2	536
<b>by central heating and fuel type</b>																
Gas central heating	0	1	1	2	10	17	20	24	18	6	1	100	6.3	6.2	6.4	2,093
Electric central heating	1	1	7	17	16	16	16	13	8	6	0	100	5.1	4.9	5.3	561
Other central heating	0	5	14	31	21	17	11	3	0	0	0	100	3.7	3.5	3.9	314
No central heating	6	17	26	21	17	8	0	3	0	0	0	100	2.7	2.4	3.0	122

**Table 5: Emission factors for carbon dioxide, sulphurous oxides and nitrous oxides: kilograms of gas per gigajoule of delivered energy**

Fuel	kg carbon dioxide per GJ	kg sulphurous oxides per GJ	kg nitrogen oxides per GJ
Mains gas	54	0	0.045
LPG	69	0	0.1
Bottled gas	69	0	0.1
Oil	75	0.08	0.05
House coal	81	0.68	0.046
Anthracite	88	0.94	0.27
Smokeless fuel	109	0.58	0.047
Wood	7	0.007	0.0045
Electricity	142	1.52	0.56
Household waste	12	0.012	0.008