

# **Domestic energy fact file: owner occupied homes**

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## **INTRODUCTION**

### **The aim of this report**

This report provides information on energy use and energy efficiency in owner occupied homes. It presents tables, graphs and charts equivalent to those in the domestic energy fact files which cover all tenures<sup>1,2</sup>. Two companion reports covering local authority<sup>3</sup> and private rented<sup>4</sup> homes have also been prepared. The information in the three new reports is consistent with the information previously presented for all tenures. In addition, data for a further year have been included. Although this particular report focuses on owner occupied homes, it also draws comparisons with local authority homes to illustrate important points.

The aim in preparing this report has been to form as complete a picture as possible of the trends in energy use and energy efficiency in owner occupied homes between 1970 and 1992. However, some data are missing, and consequently several tables only present figures from around the mid-1970s (although the relevant information for the earlier years does usually exist for homes in general<sup>1,2</sup>). The tables, graphs and charts are intended to illustrate long-term trends. Fluctuations in the figures from year to year should be viewed with caution since they may sometimes only reflect statistical variations between respective survey samples.

### **The relationship between this report and previous domestic energy fact files**

The text in this and the companion reports is kept to a minimum because the main domestic energy fact file<sup>1</sup> already provides most of the necessary discussion and explanation. Text is restricted to:

- additional explanations where needed, and
- discussion of notable differences between the characteristics of owner occupied homes and those of local authority homes or homes in general.

Most — but not all — of the tables in the original domestic energy fact files have their equivalent in this report. If a table in the original fact files does not have its equivalent in the following sections, it is either because the information is common to all tenures, or because, in a given instance, it is not very meaningful to attempt to distinguish between the different tenures.

## HOUSEHOLD EXPENDITURE ON FUEL, LIGHT AND POWER

Table 1 gives average weekly expenditure by owner occupied households on fuel, light and power and on all goods. Year-by-year actual expenditures are shown, as well as expenditures adjusted by the Retail Price Index to 1989 equivalents: 1989 is used as the reference in order to ease comparison with the figures from the main domestic energy fact file<sup>1</sup>. The adjusted expenditures are also plotted on Figure 1. Note that expenditure data by tenure are not available for years before 1981.

It is clear that owner occupied households spend only slightly more than local authority households on fuel, light and power, but substantially more on all goods. The expenditure of owner occupied households on fuel, light and power, expressed as a percentage of their expenditure on all goods, is therefore much lower than in local authority households.

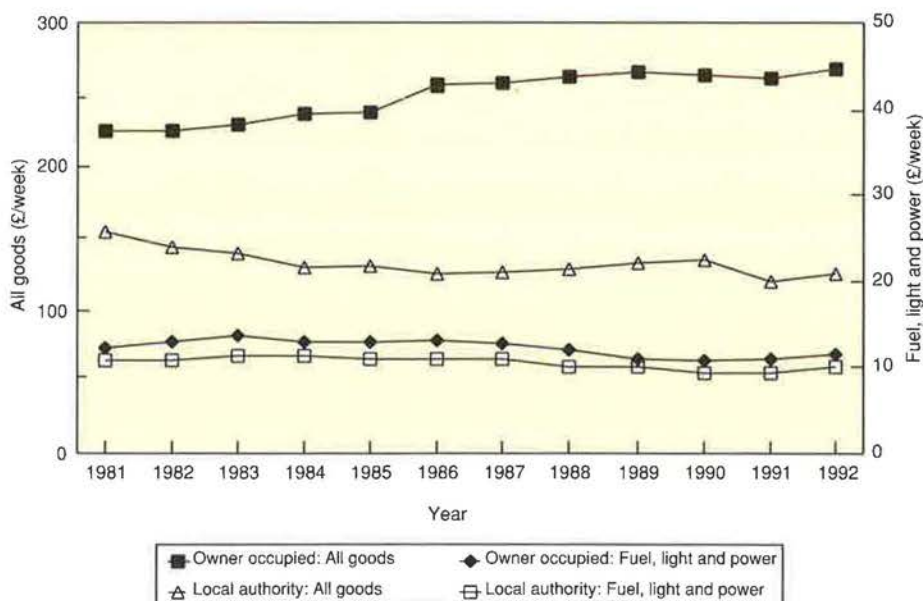
Fuel expenditures have generally fallen in real terms over the past decade. One reason for this is that fuel prices have also fallen in real terms<sup>1,2</sup> over the period. Another factor, illustrated elsewhere in this report, is that mean household sizes have been steadily reducing while insulation standards and efficiencies have been improving. Offsetting these effects to some extent has been the improving levels of service in British homes, eg the improving standards of comfort (also discussed in a subsequent section of this report).

**Table 1 Average weekly expenditure on all goods, fuel, light and power (£/week)\*†**

Year	Contemporary prices		1989 prices: owner occupiers			1989 prices: local authority		
	All goods	Fuel, light and power	All goods	Fuel, light and power	% on fuel, light and power	All goods	Fuel, light and power	% on fuel, light and power
1981	145.94	7.96	224.76	12.26	5.5	154.29	10.73	7.0
1982	158.90	9.14	225.43	12.97	5.8	143.59	10.80	7.5
1983	169.04	10.11	229.37	13.72	6.0	139.71	11.17	8.0
1984	183.52	10.09	237.01	13.03	5.5	129.94	11.17	8.6
1985	195.39	10.69	237.94	13.01	5.5	130.50	11.08	8.5
1986	217.60	11.27	256.32	13.27	5.2	124.99	11.06	8.8
1987	228.36	11.20	258.16	12.67	4.9	127.33	10.98	8.6
1988	243.57	11.12	262.48	11.99	4.6	128.35	10.13	7.9
1989	264.92	11.04	264.92	11.04	4.2	132.28	10.08	7.6
1990	289.70	11.68	264.66	10.67	4.0	135.23	9.43	7.0
1991	307.81	13.01	261.69	11.06	4.2	119.35	9.44	7.9
1992	323.60	13.72	269.16	11.41	4.2	126.04	9.98	7.9

\*Source: *Family Expenditure Survey*

†This table refers to the UK; the other tables in this report apply to Great Britain



**Figure 1** Average weekly expenditures on all goods, fuel, light and power at 1989 prices

## HOUSEHOLDS AND HOUSEHOLD SIZE

Table 2 shows figures for the number of owner occupied households and the mean household size for this tenure. The mean household size for local authority tenure is also shown. Figure 2 shows that owner occupied households tend to be slightly larger in size than local authority households. By multiplying the number of households by the mean household size, it is possible to estimate what percentage of the population was living in owner occupied households in any one year. For example, this calculation indicates that, in 1991, about 70% of the household population lived in owner occupied homes. The 1991 census<sup>5</sup> also shows about 70% living in owner occupied homes.

The numbers of owner occupied households quoted in this report are based on figures for the national housing stock published in *Housing and Construction Statistics*. Mid-year figures have been derived from that publication and then adjusted by a factor to eliminate unoccupied dwellings. The resulting figures appear under the heading 'households' in Table 2. In other tables they appear under the heading 'total houses'.

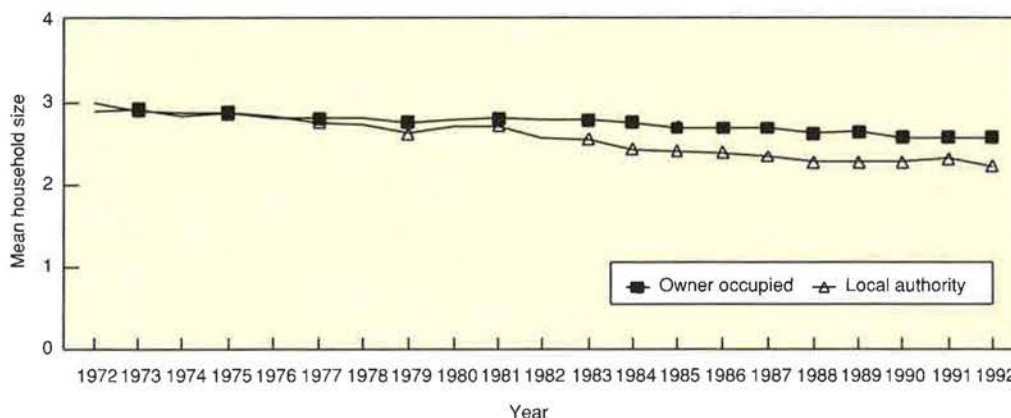
**Table 2 Households and household size\***

Year	Households (1000s)	Mean household size	
		Owner occupied	Local authority
1972	9365		
1973†	9606	2.93	2.92
1974	9770		
1975†	10004	2.89	2.86
1976	10194		
1977	10390	2.81	2.78
1978	10502		
1979†	10711	2.77	2.62
1980	10967		
1981	11265	2.81	2.73
1982	11661		
1983	12009	2.79	2.56
1984	12347	2.77	2.43
1985	12664	2.71	2.41
1986	12980	2.69	2.39
1987	13358	2.70	2.34
1988	13756	2.62	2.27
1989	13823	2.66	2.28
1990	14459	2.59	2.28
1991	14682	2.59	2.33
1992	14916	2.57	2.24

\*Sources: *Housing and Construction Statistics* (households)

*General Household Survey* (mean household size)

†The mean household sizes for these years have been extrapolated or interpolated



**Figure 2** Mean household size



## AGE OF THE HOUSING STOCK

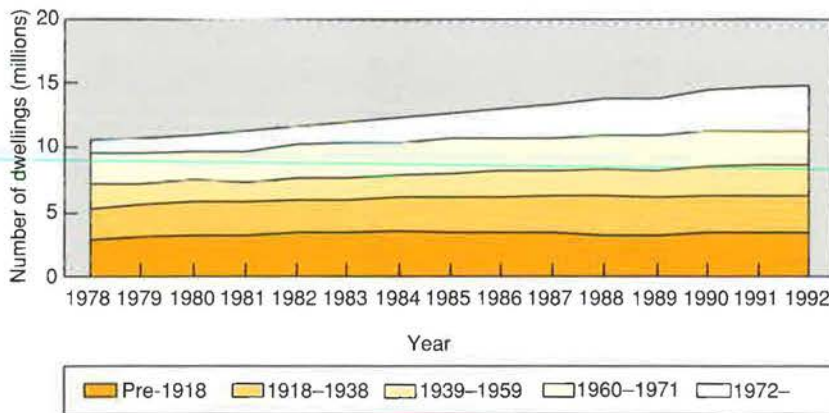
The current distribution of owner occupied homes between the different age categories is quite even.

The age categories used for this report and its companions are not the same as those used for the original domestic energy fact file<sup>1</sup>. The source used for the original report (*Housing and Construction Statistics*) did not allow the distribution to be determined for individual tenures, and so another source had to be used (*GfK Home Audit*). There are some significant discrepancies between these sources. Therefore the reader is warned that the age distributions need to be viewed with some caution.

**Table 3 Housing stock distribution by age (1000s of houses)\***

Year	Pre-1918	1918-1938	1939-1959	1960-1971	1972-	Total houses
1978	2928	2375	1835	2339	1025	10502
1979	3075	2501	1640	2323	1172	10711
1980	3297	2538	1643	2297	1192	10967
1981	3250	2571	1498	2466	1480	11265
1982	3361	2581	1738	2525	1456	11661
1983	3358	2656	1728	2573	1694	12009
1984	3479	2676	1724	2561	1907	12347
1985	3446	2730	1889	2597	2002	12664
1986	3328	2824	1949	2689	2190	12980
1987	3376	2863	1890	2552	2677	13358
1988	3286	2942	2068	2673	2787	13756
1989	3158	2937	2152	2646	2930	13823
1990	3315	2918	2227	2782	3217	14459
1991	3366	3002	2280	2645	3389	14682
1992	3314	3065	2337	2560	3640	14916

\*Source: *GfK Home Audit*



**Figure 3** Housing stock distribution by age



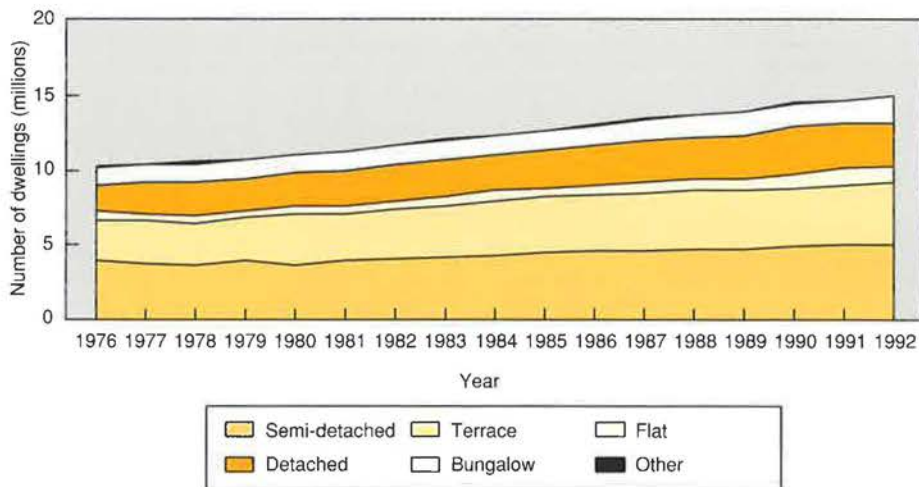
## HOUSE TYPES

Table 4 and Figure 4 illustrate the distribution of house types in the owner occupied stock. It is rather similar to the distribution across all tenures<sup>1,2</sup>. However, it differs markedly from the corresponding distribution for local authority houses, in which there is a predominance of flats and very few detached houses<sup>3</sup>. For a given standard of insulation, a flat will have the lowest heat loss, and a detached house will have the highest heat loss, of all house types. Consequently, the average owner occupied home has a slightly higher heat loss than the average for all homes (see Table 12).

**Table 4 Housing stock distribution by type of dwelling (1000s of houses)\***

Year	Semi-detached	Terrace	Flat	Detached	Bungalow	Other	Total houses
1976	3875	2833	483	1793	1157	53	10194
1977	3788	2838	467	2000	1243	54	10390
1978	3591	2801	576	2127	1286	121	10502
1979	3872	2892	470	2246	1139	92	10711
1980	3663	3385	511	2211	1113	84	10967
1981	3927	3147	547	2328	1249	67	11265
1982	4071	3326	531	2413	1256	63	11661
1983	4207	3421	507	2492	1327	55	12009
1984	4362	3561	606	2448	1321	49	12347
1985	4399	3719	643	2566	1293	44	12664
1986	4598	3718	669	2577	1356	62	12980
1987	4649	3819	738	2678	1431	43	13358
1988	4725	3909	790	2799	1438	95	13756
1989	4747	3817	799	2938	1479	43	13823
1990	4869	3890	966	3108	1602	24	14459
1991	4967	4087	1086	2013	1494	35	14682
1992	4976	4097	1153	2987	1681	22	14916

\*Source: GfK Home Audit



**Figure 4** Housing stock distribution by type of dwelling

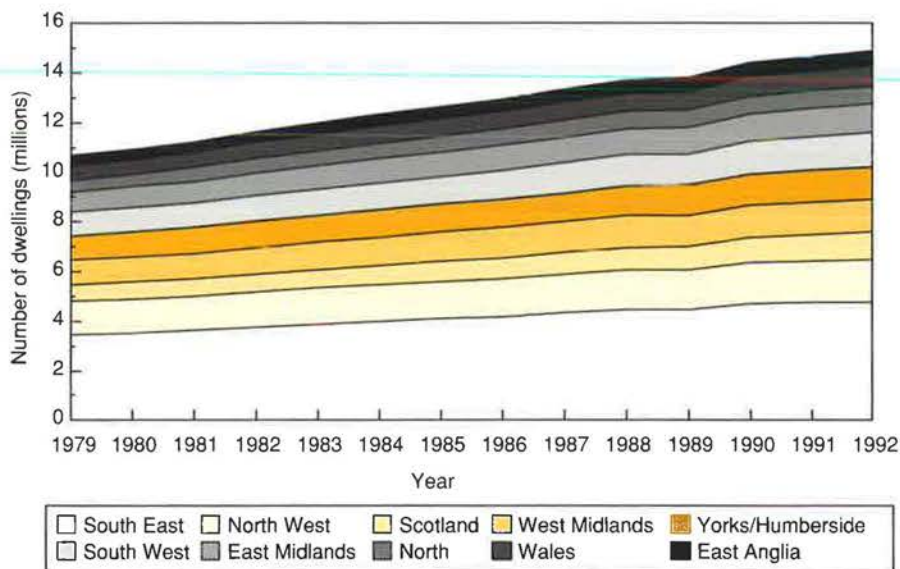
## REGIONAL DISTRIBUTION OF THE HOUSING STOCK

Regional distribution of the housing stock does not vary markedly with tenure. The main difference between the owner occupied and local authority tenures is in the proportion of homes in Scotland. Renting from a local authority is much more common in Scotland than in the rest of Great Britain: 16.4% of all local authority homes are in Scotland, compared with only 7.5% of owner occupied homes. There has been little change in the regional distribution of the owner occupied stock with time.

**Table 5 Housing stock distribution by region (1000s of houses)\***

Year	England	South West	Wales	South East	East Anglia	Yorkshire, Humberside	East Midlands	West Midlands	North West	North	Scotland	Total houses
1970	7843		500								528	8871
1971	8038		512								538	9088
1972	8289		525								551	9365
1973	8499		541								566	9606
1974	8641		550								579	9770
1975	8843		563								598	10004
1976	9006		573								615	10194
1977	9176		583								631	10390
1978	9275		585								642	10502
1979	9458	994	592	3461	394	958	781	1003	1352	516	660	10711
1980	9686	1034	599	3525	412	985	804	1028	1372	527	681	10967
1981	9969	1047	636	3621	423	1019	844	1062	1404	549	660	11265
1982	10326	1085	648	3741	439	1054	882	1099	1446	580	687	11661
1983	10627	1117	670	3855	455	1077	910	1131	1481	601	712	12009
1984	10907	1149	681	3974	473	1098	933	1158	1503	619	756	12347
1985	11180	1181	699	4087	487	1123	954	1185	1529	634	785	12664
1986	11455	1213	713	4169	504	1148	986	1216	1562	656	813	12980
1987	11775	1251	733	4334	519	1173	1007	1239	1583	670	849	13358
1988	12113	1292	754	4468	541	1203	1038	1271	1611	688	890	13756
1989	12131	1300	756	4479	545	1203	1043	1270	1603	688	936	13823
1990	12643	1351	790	4673	571	1254	1084	1325	1661	724	1026	14459
1991	12814	1369	802	4733	582	1271	1100	1345	1679	735	1066	14682
1992	12969	1400	824	4770	583	1289	1124	1354	1691	758	1123	14916

\*Source: *Housing and Construction Statistics*



**Figure 5** Housing stock distribution by region

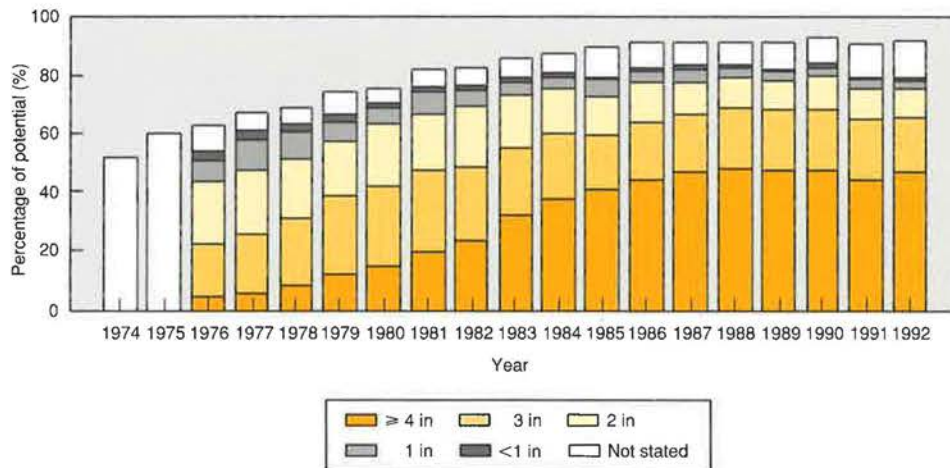
## LOFT INSULATION

Uptake of loft insulation in owner occupied households has been stronger than in rented homes, although the rented sector has been catching up. The current proportion of owner occupied households with accessible lofts which have loft insulation is 92.3%. This is higher than the corresponding figure for either local authority households (89.7%) or private rented households (76.2%). Loft insulation in owner occupied homes also tends to be deeper than in rented homes.

**Table 6 Ownership and depth of loft insulation (1000s of houses)\***

Year	Depth of insulation						Owner occupied houses		
	<1 in	1 in	2 in	3 in	≥4 in	Not stated	Total with insulation	Potential	Total houses
1974	0	0	0	0	0	4504	4504	8630	9770
1975	0	0	0	0	0	5254	5254	8768	10004
1976	281	651	1885	1587	370	798	5572	8865	10194
1977	313	982	2001	1786	526	511	6119	9111	10390
1978	243	828	1889	2110	789	545	6405	9274	10502
1979	236	590	1798	2443	1186	714	6968	9392	10711
1980	205	490	2071	2658	1459	448	7331	9741	10967
1981	195	681	1973	2761	1961	584	8155	9977	11265
1982	203	577	2148	2623	2477	632	8660	10456	11661
1983	194	425	1968	2497	3500	747	9332	10833	12009
1984	167	450	1758	2537	4184	712	9808	11232	12347
1985	98	645	1568	2130	4716	1151	10309	11535	12664
1986	132	539	1536	2318	5273	1045	10843	11837	12980
1987	178	526	1316	2371	5679	941	11011	12087	13358
1988	95	365	1325	2522	6037	1047	11391	12439	13756
1989	95	363	1305	2510	5967	1184	11425	12489	13823
1990	130	388	1505	2653	6239	1171	12086	13037	14459
1991	78	411	1422	2689	5764	1501	11864	13094	14682
1992	189	309	1320	2514	6152	1684	12168	13185	14916

\*Source: GfK Home Audit



**Figure 6 Ownership and depth of loft insulation**



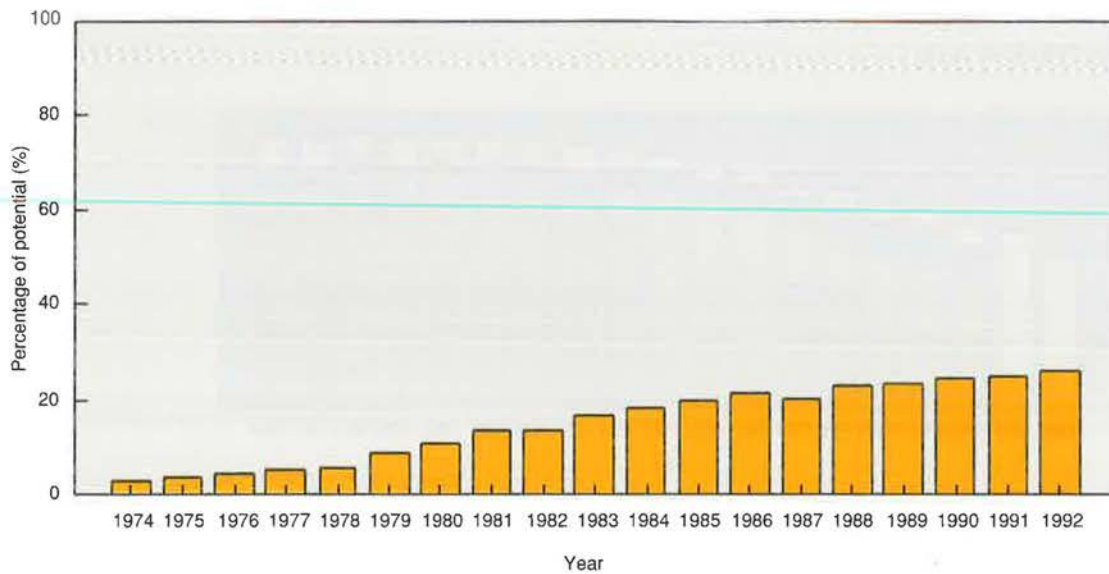
## CAVITY WALL INSULATION

Uptake of cavity wall insulation in owner occupied homes has shown a slow and steady improvement. Currently, 26% of owner occupied homes with cavity walls have had them insulated. This is higher than the corresponding figure for local authority homes (19%).

**Table 7 Ownership of cavity wall insulation (1000s of houses)\***

Year	Houses with cavity insulation	Potential	Total houses
1974	202	7470	9770
1975	266	7648	10004
1976	333	7980	10194
1977	445	8308	10390
1978	483	8580	10502
1979	678	7698	10711
1980	760	7011	10967
1981	998	7439	11265
1982	1032	7745	11661
1983	1319	8074	12009
1984	1467	8071	12347
1985	1732	8634	12664
1986	1838	8751	12980
1987	1872	9175	13358
1988	2141	9440	13756
1989	2213	9499	13823
1990	2449	9914	14459
1991	2598	10323	14682
1992	2794	10764	14916

\*Source: GJK Home Audit



**Figure 7** Ownership of cavity wall insulation

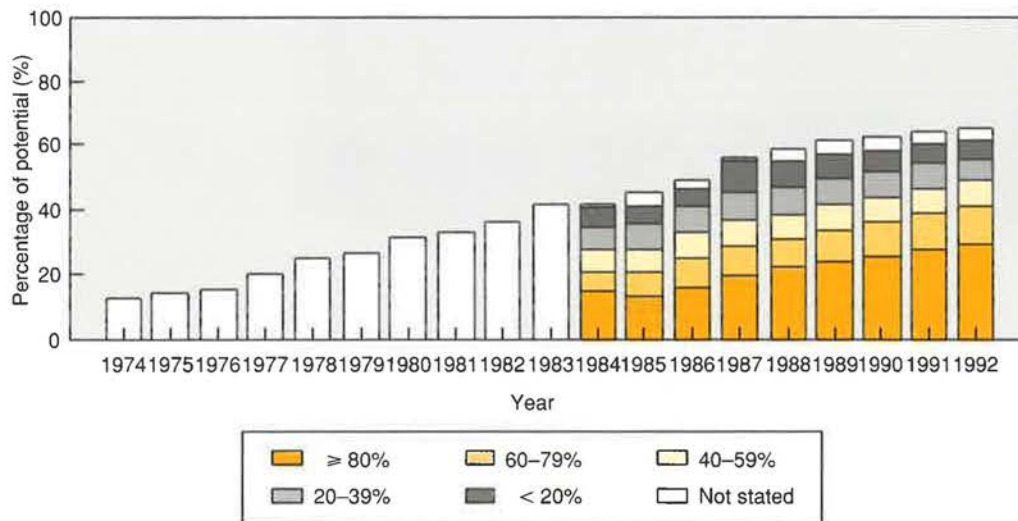
## DOUBLE GLAZING

Double glazing has been taken up in owner occupied homes much more strongly than in rented homes. Currently, over 65% of owner occupied homes have some double glazing. The corresponding figure for local authority homes is only about 24%.

**Table 8 Ownership of double glazing (1000s of houses)\***

Year	Percentage of rooms treated						Owner occupied houses	
	<20%	20-39%	40-59%	60-79%	≥80%	Not stated	Total with double glazing	Potential
	1974	0	0	0	0	0	1234	1234
1975	0	0	0	0	0	1415	1415	10004
1976	0	0	0	0	0	1598	1598	10194
1977	0	0	0	0	0	2102	2102	10390
1978	0	0	0	0	0	2622	2622	10502
1979	0	0	0	0	0	2877	2877	10711
1980	0	0	0	0	0	3642	3642	10967
1981	0	0	0	0	0	3730	3730	11265
1982	0	0	0	0	0	4193	4193	11661
1983	0	0	0	0	0	5012	5012	12009
1984	712	912	827	752	1837	103	5143	12347
1985	677	1019	909	876	1737	563	5781	12664
1986	658	1102	995	1135	2111	338	6339	12980
1987	1307	1165	1061	1216	2650	82	7481	13358
1988	1062	1180	1101	1220	3053	608	8134	13756
1989	1002	1128	1092	1323	3345	638	8528	13823
1990	949	1196	1034	1488	3747	549	8963	14459
1991	955	1178	1024	1638	4094	547	9436	14682
1992	881	1018	1139	1714	4412	556	9720	14916

\*Source: GfK Home Audit



**Figure 8** Ownership of double glazing

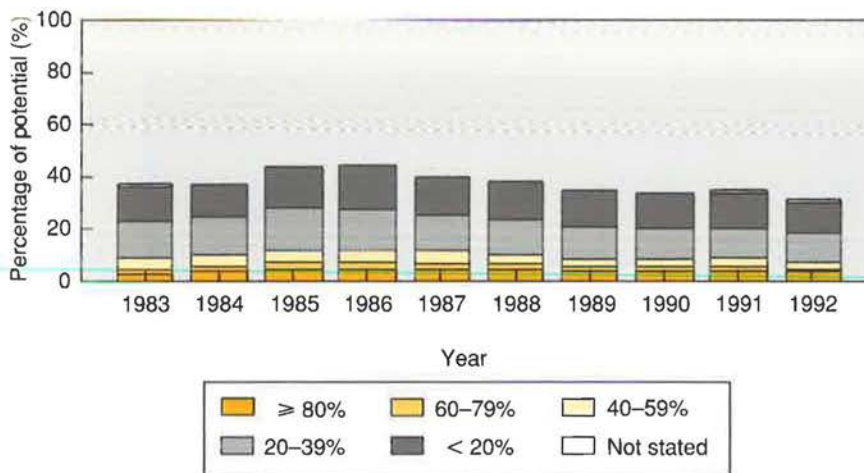
## DRAUGHT STRIPPING

Draught stripping in owner occupied homes shows no obvious trends. The general pattern in the ownership levels is similar to the pattern for all tenures. However, the greater consistency of the figures in recent years does suggest that the steady decline in ownership might be a real effect. As noted in the main domestic energy fact file<sup>1</sup>, the reason for this could well be the increasing ownership of double glazing: good quality double glazing incorporates integral draught seals, so draught stripping such windows is unnecessary. This argument is supported by the fact that draught stripping is installed in 39.8% of local authority homes (where double glazing is less common): this is now considerably higher than the corresponding figure for owner occupied homes (30.9%).

**Table 9 Ownership of draught stripping (1000s of houses)\***

Year	Percentage of rooms treated						Owner occupied houses	
	<20%	20-39%	40-59%	60-79%	≥80%	Not stated	Total with draught stripping	Potential
1983	1592	1663	478	211	411	150	4505	12009
1984	1657	1758	541	235	467	0	4658	12347
1985	1944	2045	631	296	622	0	5538	12664
1986	2202	2087	545	282	685	0	5801	12980
1987	1976	1881	633	275	644	0	5409	13358
1988	2011	1860	549	240	627	0	5287	13756
1989	1872	1768	445	209	527	0	4821	13823
1990	1984	1676	545	197	539	0	4941	14459
1991	2077	1716	473	226	620	38	5150	14682
1992	1776	1659	424	185	527	36	4607	14916

\*Source: GfK Home Audit



**Figure 9 Ownership of draught stripping**



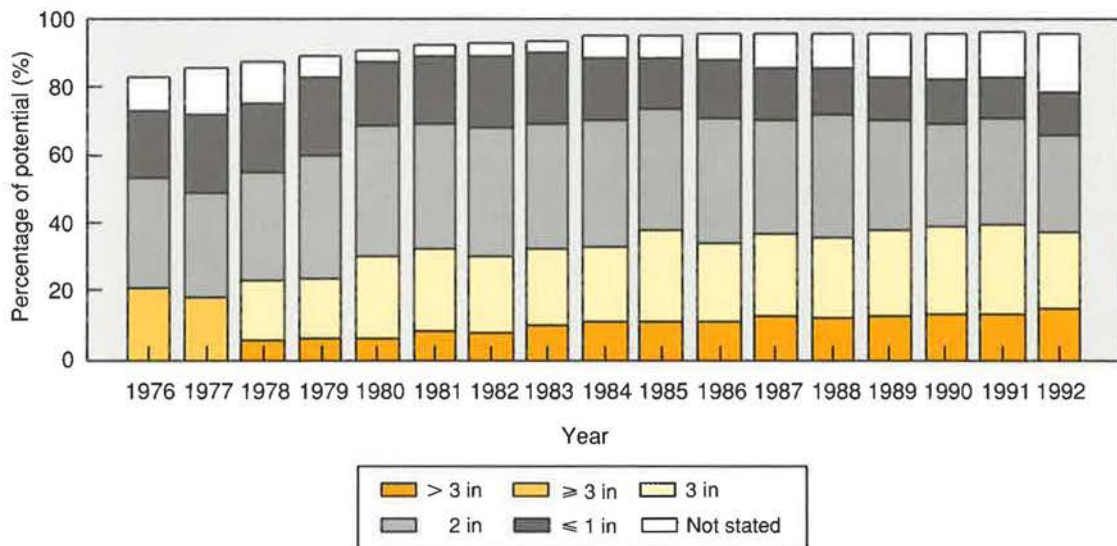
## HOT WATER TANK INSULATION

Hot water tank insulation has been taken up more strongly in owner occupied homes than it has in local authority homes (although the local authority sector has been catching up). About 96% of owner occupied homes with hot water tanks currently have tank insulation. The corresponding figure for local authority homes is about 91%.

**Table 10 Ownership of hot water tank insulation (1000s of houses)\***

Year	Depth of insulation					Owner occupied houses			
	≤1 in	2 in	3 in	≥3 in	>3 in	Not stated	Total with insulation	Potential	Total houses
1976	1826	2963		1931		899	7619	9208	10194
1977	2233	2863		1737		1262	8095	9409	10390
1978	1884	3036	1660		502	1172	8254	9426	10502
1979	2412	3794	1934		613	636	9389	10515	10711
1980	1776	3849	2347		622	362	8956	9860	10967
1981	1986	3719	2419		818	298	9240	10009	11265
1982	2244	3942	2393		821	363	9763	10530	11661
1983	2190	4075	2466		1043	433	10207	10861	12009
1984	2096	4119	2498		1213	675	10601	11169	12347
1985	1692	4185	3092		1331	806	11106	11641	12664
1986	1982	4408	2700		1347	935	11372	11897	12980
1987	1974	4063	2970		1540	1228	11775	12247	13358
1988	1765	4541	3110		1503	1220	12139	12675	13756
1989	1587	4081	3232		1554	1629	12083	12590	13823
1990	1740	3997	3314		1750	1780	12581	13080	14459
1991	1621	4111	3521		1717	1783	12753	13197	14682
1992	1665	3789	3068		1950	2273	12745	13314	14916

\*Source: GfK Home Audit



**Figure 10** Ownership of hot water tank insulation

## ENERGY CONSUMPTION AND EXTERNAL TEMPERATURES

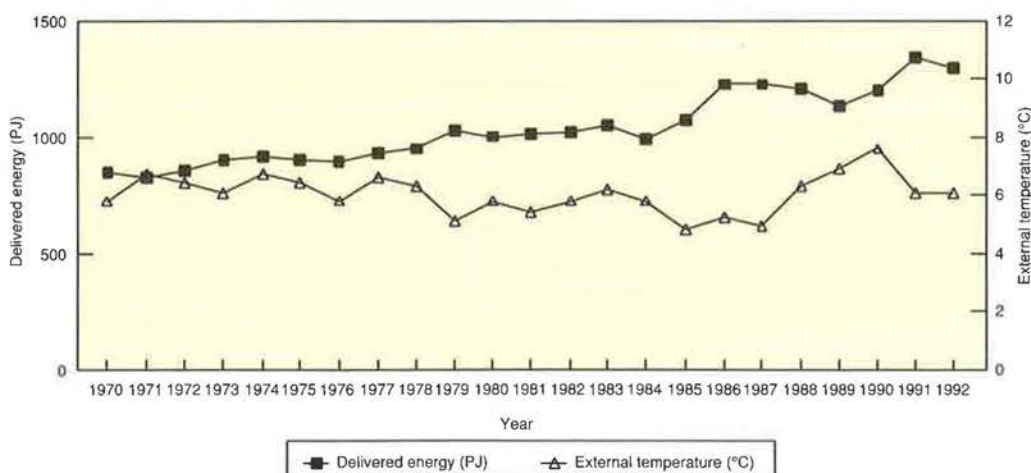
Energy consumption of owner occupied homes shows a similar trend between 1970 and 1992 to that for all homes, except that the rise in energy use is more marked (see Table 11). This is because the number of owner occupied homes has been growing more rapidly than the number of homes in general. The average consumption per dwelling has remained relatively stable throughout, at a level around 25% higher than for local authority homes.

Peaks in energy use generally correspond with troughs in the external temperature, as would be expected. Note that the energy use figures before 1981 are slightly more speculative than those from 1981 onwards. This is due to the lack of expenditure data by tenure for years before 1981. However, the estimates given are likely to be close to the true consumptions: firstly, because of the constraints that the figures for the individual tenures must add to the known total consumptions, and secondly, because the estimates are consistent with the trends within those tenures.

**Table 11 Domestic energy consumption and external temperatures\***

Year	Total houses (1000s)		Total delivered energy (PJ)		Average external temperature (°C)	Average consumption per owner occupied dwelling (GJ)
	Owner occupiers	All tenures	Owner occupiers	All tenures		
1970	8871	17759	843.2	1502	5.8	95.1
1971	9088	17990	824.1	1453	6.7	90.7
1972	9365	18192	855.1	1482	6.4	91.3
1973	9606	18367	895.6	1531	6.1	93.2
1974	9770	18545	909.0	1544	6.7	93.0
1975	10004	18747	895.1	1503	6.4	89.5
1976	10194	18971	891.5	1488	5.8	87.5
1977	10390	19203	927.4	1539	6.6	89.3
1978	10502	19401	948.2	1572	6.3	90.3
1979	10711	19575	1026.6	1686	5.1	95.8
1980	10967	19756	999.0	1620	5.8	91.1
1981	11265	19921	1012.0	1615	5.4	89.8
1982	11661	20067	1020.4	1592	5.8	87.5
1983	12009	20225	1051.6	1585	6.2	87.6
1984	12347	20402	988.4	1541	5.8	80.1
1985	12664	20580	1073.3	1696	4.8	84.7
1986	12980	20760	1226.9	1768	5.2	94.5
1987	13358	20945	1225.7	1760	4.9	91.8
1988	13756	21138	1200.1	1708	6.3	87.2
1989	13823	21340	1131.7	1638	6.9	81.9
1990	14459	21531	1197.4	1653	7.6	82.8
1991	14682	21698	1335.9	1822	6.1	91.0
1992	14916	21932	1294.9	1782	6.1	86.8

\*Sources: Family Expenditure Survey, Digest of United Kingdom Energy Statistics



**Figure 11 Domestic energy consumption and external temperatures**

## HEAT LOSS OF THE AVERAGE OWNER OCCUPIED DWELLING

Clearly, since the majority of homes are owner occupied, the heat loss of the average owner occupied home would be expected to be not too different from the overall average. If there was any difference, it should reduce with time, because of the growing proportion of homes which are owner occupied. Figure 12 shows that this is indeed the case.

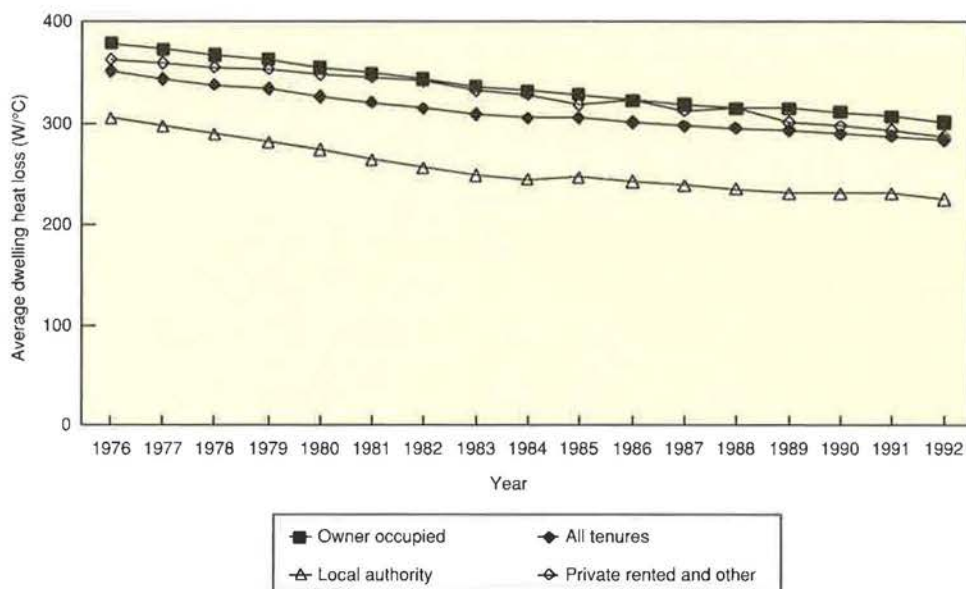
The heat loss from owner occupied dwellings is slightly higher than the overall average. This is because, although insulation standards tend to be better in owner occupied homes, the distribution of house types is biased towards more detached houses and fewer flats (as discussed in a previous section of this report). Table 12 and Figure 12 also give average heat losses for the other tenures, and these show the expected trends and values relative to the owner occupied figures.

**Table 12 Heat loss of the average owner occupied dwelling\***

Year	Average dwelling heat loss (W/°C)			
	All tenures	Owner occupied	Local authority	Private rented and other
1976	351.2	378.9	305.7	363.3
1977†	345.0	373.1	297.3	359.6
1978†	339.0	367.5	289.3	356.1
1979†	334.0	362.8	282.5	353.2
1980†	327.0	356.2	273.1	349.0
1981†	321.0	350.6	265.0	345.5
1982	314.7	344.7	256.5	341.8
1983†	309.0	336.7	248.3	332.4
1984	306.1	332.7	244.1	327.6
1985	304.3	328.1	246.0	318.5
1986	300.4	323.1	242.4	322.8
1987	296.9	319.1	238.2	313.4
1988	294.7	315.5	235.8	314.5
1989	292.6	314.1	231.9	302.0
1990†	290.2	310.3	231.4	298.1
1991	287.8	306.5	230.8	294.1
1992	283.0	301.5	225.4	287.7

\*Source: BREHOMES

†Figures for these years are interpolated



**Figure 12** Heat loss of the average owner occupied dwelling



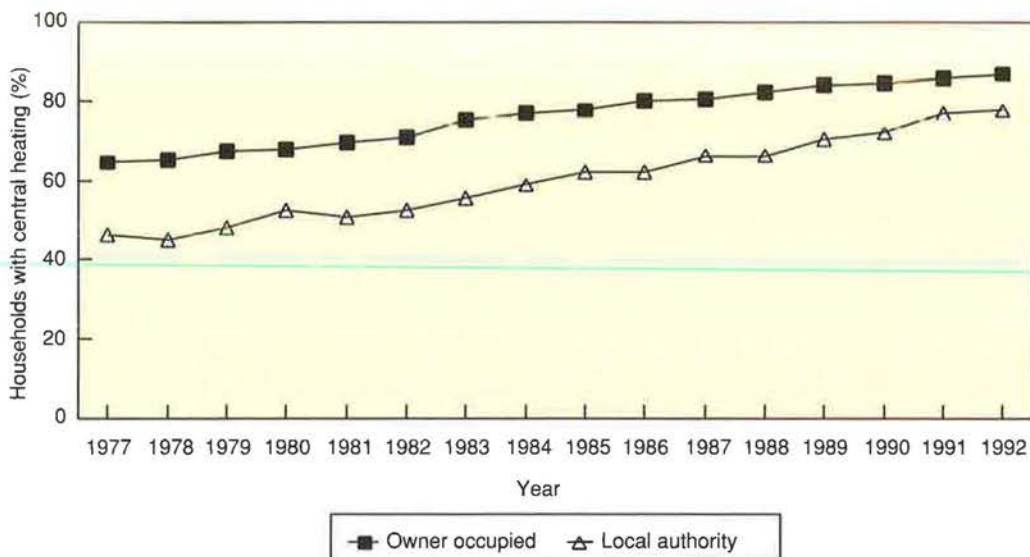
## CENTRAL HEATING OWNERSHIP

Central heating is more common in owner occupied homes than it is in local authority homes. By 1992, over 86% of owner occupied homes had central heating. The corresponding figure for local authority homes was just over 77%.

**Table 13 Central heating ownership\***

Year	Owner occupied houses (1000s)			Percentage of households with central heating	
	No central heating	Central heating	Total houses	Owner occupied	Local authority
	1977	3692	6698	10390	64.5
1978	3656	6846	10502	65.2	45.3
1979	3517	7194	10711	67.2	48.0
1980	3512	7455	10967	68.0	52.3
1981	3407	7858	11265	69.8	50.6
1982	3401	8260	11661	70.8	52.6
1983	2933	9076	12009	75.6	55.1
1984	2857	9490	12347	76.9	58.9
1985	2814	9850	12664	77.8	62.1
1986	2641	10339	12980	79.7	62.1
1987	2605	10753	13358	80.5	65.9
1988	2482	11274	13756	82.0	66.3
1989	2232	11591	13823	83.9	70.2
1990	2280	12179	14459	84.2	72.0
1991	2093	12589	14682	85.7	76.9
1992	1983	12933	14916	86.7	77.8

\*Source: GfK Home Audit



**Figure 13** Central heating ownership

## HEATING APPLIANCES

There has been a strong increase in the proportion of owner occupied homes with gas central heating. By 1992, nearly 70% of owner occupied homes were heated by such systems. In local authority homes the figure was nearly 55%. Individual gas heaters provided the next most common form of heating, so that gas as a whole accounted for over 79% of heating systems in owner occupied homes. For local authority homes the corresponding figure was just over 69%.

Electric central heating accounted for just under 9% of systems in owner occupied homes, but just over 12% in local authority homes. Other forms of heating individually represent a small, and generally declining, proportion of homes.

**Table 14a Main form of heating in centrally heated dwellings (1000s of houses)\***

Year	Solid fuel	Electric	Electric storage	Other electric	Gas	Oil	Other	Oil + other	Total houses
1978	614	1165			4374			693	6846
1979	543	1007			5032			612	7194
1980	639	917			5380			519	7455
1981	616	920	726	194	5900	411	11		7858
1982	656	936	746	190	6274	385	9		8260
1983	741	995	783	212	6843	459	38		9076
1984	719	1082	794	288	7177	483	29		9490
1985	902	1041	797	244	7431	459	17		9850
1986	854	808	660	148	8216	412	49		10339
1987	833	885	724	161	8505	468	62		10753
1988	838	1003	811	192	8786	493	154		11274
1989	770	1039	842	197	9151	475	156		11591
1990	751	1183	994	189	9572	503	170		12179
1991	723	1303	1112	191	9848	530	185		12589
1992	589	1327	1151	176	10403	480	134		12933

\*Source: GfK Home Audit

**Table 14b Main form of heating in non-centrally heated dwellings (1000s of houses)\***

Year	Solid fuel	Electric	Gas	Oil	Other	Oil + other	Total houses
1978	1062	687	1753			154	3656
1979	842	727	1787			161	3517
1980	761	663	1894			194	3512
1981†	578	615	2019			195	3407
1982†	566	586	2063			186	3401
1983	607	383	1815	38	90		2933
1984†	585	386	1804	25	57		2857
1985†	504	426	1822	12	50		2814
1986	521	241	1822	7	50		2641
1987	448	260	1842	8	47		2605
1988	435	249	1746	4	48		2482
1989	413	207	1565	3	44		2232
1990	382	242	1610	3	43		2280
1991	358	213	1479	6	37		2093
1992	309	216	1424	3	31		1983

\*Source: GfK Home Audit

†Figures for these years are interpolated

There is no Figure 14.

## WEIGHTED AVERAGE SPACE HEATING EFFICIENCIES

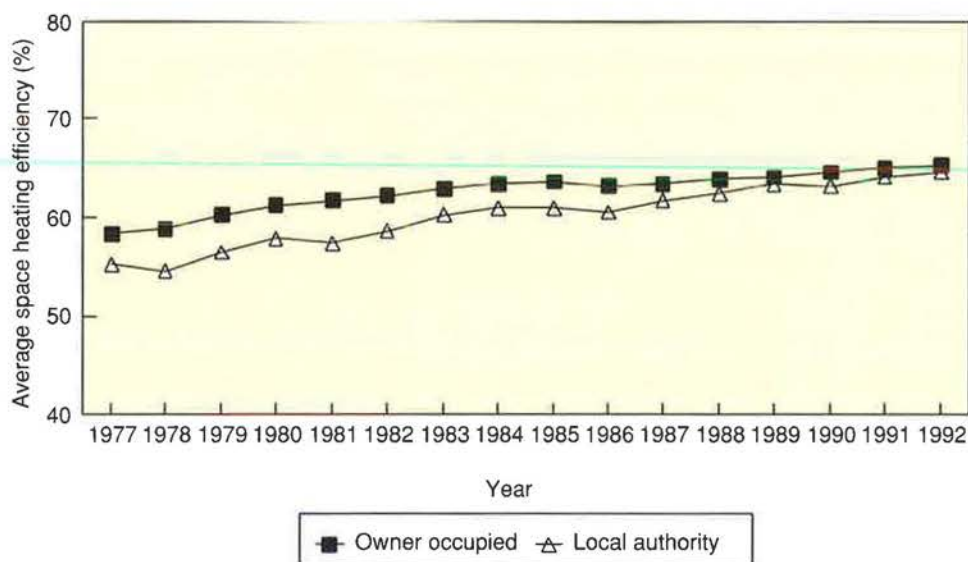
Table 15 shows heating efficiencies calculated on the same basis as for the domestic energy fact file update<sup>2</sup>. Data are given for owner occupied homes and local authority homes. The heating efficiency is slightly higher in owner occupied homes (see Figure 15) because a higher proportion of owner occupied homes have central heating. However, the difference is not quite as large as might be expected. This is because a relatively low proportion of owner occupied homes have electric heating (for which the efficiency is taken to be 100%).

**Table 15 Weighted average space heating efficiencies (%)\***

Year	Central heating efficiency	Non-central heating efficiency	Average efficiency	
			Owner occupied	Local authority
1977†	68	47	58	55
1978	68	47	59	55
1979	67	50	60	57
1980	68	51	61	58
1981	68	52	62	57
1982	68	52	62	59
1983	68	51	63	60
1984	68	51	64	61
1985	68	52	64	61
1986	68	50	63	61
1987	68	51	64	62
1988	68	51	64	63
1989	68	50	64	63
1990	68	51	65	63
1991	68	51	65	64
1992	68	51	65	65

\*Source: BREHOMES

†Figures for this year have been extrapolated



**Figure 15** Weighted average space heating efficiencies



## STANDARDS OF COMFORT

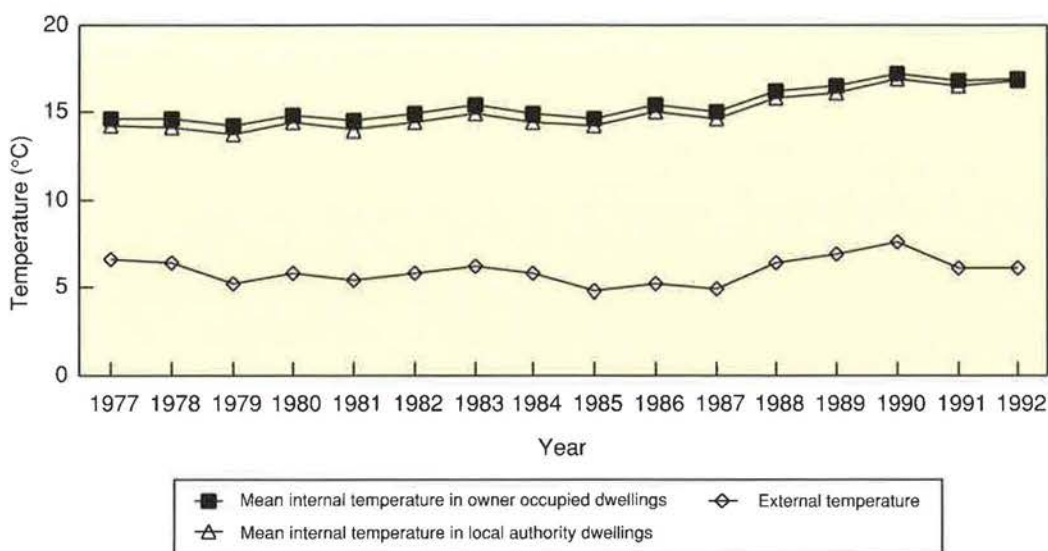
The main domestic energy fact files<sup>1,2</sup> present some estimates for mean internal temperatures. It is noted in these previous reports that the absolute values should be viewed with some caution, but that greater confidence can be attached to the extent of the rise in temperatures. Table 16 presents some tentative estimates of mean internal temperatures in owner occupied homes, and compares these with estimates for local authority homes.

The temperatures assumed for centrally heated and non-centrally heated homes are exactly the same as those in the update to the main domestic energy fact file<sup>2</sup>. The overall average has been calculated from these temperatures, knowing the numbers of owner occupied homes with and without central heating. As might be expected, this indicates that owner occupied homes tend to be slightly warmer than local authority homes.

**Table 16 Standards of comfort: mean internal and average winter external temperatures\***

Year	Percentage of dwellings with central heating	Calculated average internal temperatures (°C)		External temperature (°C)	Total houses (1000s)
		Owner occupied	Local authority		
1977	64.5	14.70	14.24	6.6	10390
1978	65.2	14.66	14.16	6.3	10502
1979	67.2	14.19	13.71	5.1	10711
1980	68.0	14.77	14.38	5.8	10967
1981	69.8	14.47	14.00	5.4	11265
1982	70.8	14.87	14.42	5.8	11661
1983	75.6	15.43	14.92	6.2	12009
1984	76.9	14.85	14.40	5.8	12347
1985	77.8	14.61	14.22	4.8	12664
1986	79.7	15.44	15.00	5.2	12980
1987	80.5	15.05	14.69	4.9	13358
1988	82.0	16.27	15.88	6.3	13756
1989	83.9	16.47	16.12	6.9	13823
1990	84.2	17.24	16.93	7.6	14459
1991	85.7	16.76	16.54	6.1	14682
1992	86.7	16.97	16.74	6.1	14916

\*Source: BREHOMES



**Figure 16** Standards of comfort: mean internal and average winter external temperatures

## ENERGY CONSUMPTION BY END USE

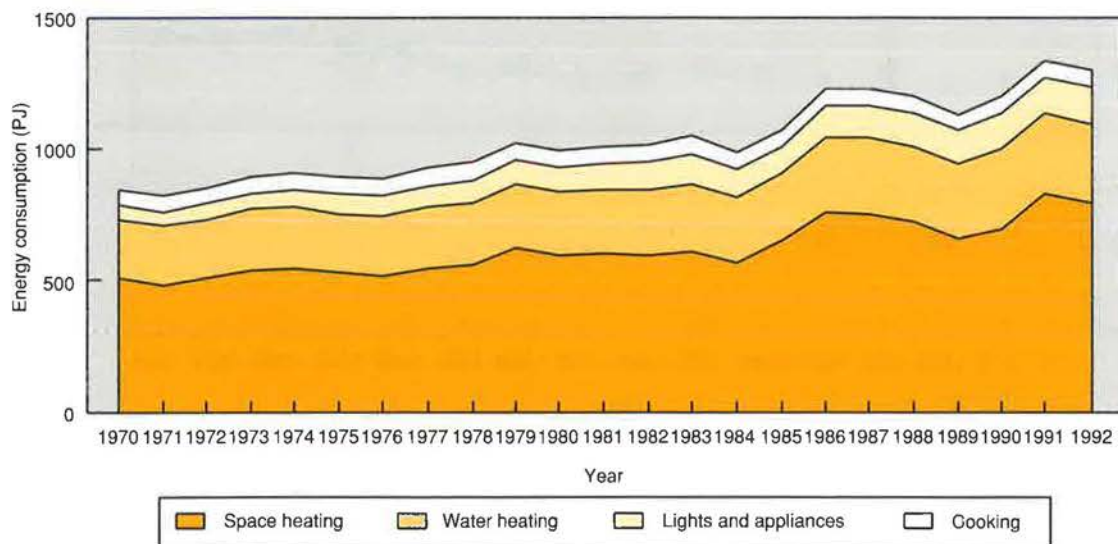
The distribution of total domestic energy consumption between the main end uses is necessarily a little tentative, particularly for individual tenures.

The figures quoted below for owner occupied homes are based on the assumption that the proportions for the individual end uses are the same as those already estimated for all tenures. The same assumption has also been used for the other tenures<sup>3,4</sup>. This assumption may not be entirely correct but it is unlikely to be seriously in error.

**Table 17 Domestic energy consumption by end use\***

Year	End uses (PJ)				All energy (PJ)	Space heating per household (GJ)
	Space heating	Water heating	Lights and appliances	Cooking		
1970	505.8	228.5	49.1	59.7	843.2	57.0
1971	483.8	225.9	53.4	61.0	824.1	53.2
1972	509.6	224.1	58.9	62.5	855.1	54.4
1973	538.2	229.9	63.9	63.6	895.6	56.0
1974	548.9	227.4	68.4	64.4	909.0	56.2
1975	530.7	225.5	73.2	65.7	895.1	53.1
1976	516.7	231.1	77.0	66.7	891.5	50.7
1977	543.0	235.8	81.0	67.6	927.4	52.3
1978	558.0	237.8	84.2	68.2	948.2	53.1
1979	627.5	241.7	88.0	69.3	1026.6	58.6
1980	601.9	235.3	91.9	70.0	999.0	54.9
1981	606.4	238.6	96.2	70.7	1012.0	53.8
1982	601.8	245.9	101.2	71.5	1020.4	51.6
1983	615.6	256.6	107.1	72.3	1051.6	51.3
1984	572.4	242.5	105.8	67.7	988.4	46.4
1985	652.6	249.6	106.9	64.1	1073.3	51.5
1986	761.7	277.7	120.0	67.6	1226.9	58.7
1987	757.2	280.3	123.0	65.3	1225.7	56.7
1988	723.1	287.1	126.2	63.4	1200.1	52.6
1989	662.2	283.1	126.3	60.2	1131.7	47.9
1990	699.5	300.8	135.7	61.4	1197.4	48.4
1991	828.8	306.2	139.9	61.1	1335.9	56.5
1992	791.2	303.7	140.1	59.9	1294.9	53.0

\*Source: BREHOMES



**Figure 17** Domestic energy consumption by end use

## DOMESTIC ENERGY CONSUMPTION BY FUEL

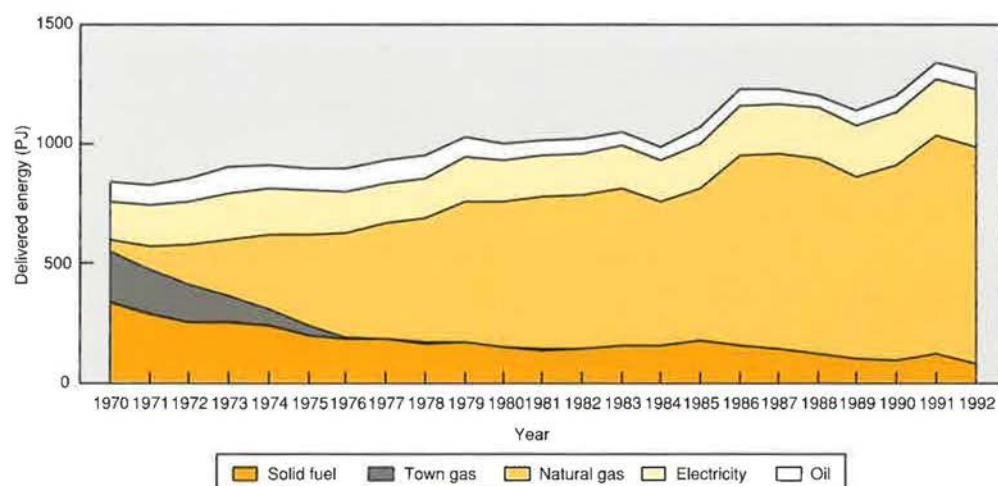
The total energy use figures for owner occupied homes quoted in Table 11 and Table 17 were actually worked out using information relating to individual fuels. Table 18 presents the estimated consumptions by fuel. As noted in a previous section of this report, the figures before 1981 are a little more tentative than those from 1981 onwards. However, the estimates given are likely to be close to the true consumptions: firstly, because of the constraints that the figures for the individual tenures must add to the known total consumptions of each fuel, and secondly, because the estimates are consistent with the trends within those tenures.

The general pattern which emerges for owner occupied homes is the same as the pattern for all tenures. It is characterised by the rapid penetration of natural gas, the disappearance of town gas, and the declining use of solid fuel and oil.

**Table 18 Energy use of the housing stock by fuel type\***

Year	Fuel type (PJ)						All fuels (PJ)	Average consumption per household (GJ)
	Solid fuels	Natural gas	Town gas	Gas (total)	Electric	Oil		
1970	336.3	46.1	213.7	259.8	160.3	86.8	843.2	95.1
1971	285.6	103.9	183.3	287.2	166.4	84.9	824.1	90.7
1972	250.6	167.4	161.3	328.7	178.6	97.2	855.1	91.3
1973	247.3	235.4	116.4	351.8	189.2	107.3	895.6	93.2
1974	231.3	316.2	75.7	391.9	190.6	95.2	909.0	93.0
1975	194.4	391.2	35.9	427.1	182.5	91.1	895.1	89.5
1976	179.4	437.4	10.5	447.9	173.3	90.9	891.5	87.5
1977	182.6	474.8	3.2	478.0	174.8	92.0	927.4	89.3
1978	163.8	520.5	1.4	521.9	172.8	89.7	948.2	90.3
1979	165.8	590.7	1.3	592.0	181.3	87.5	1026.6	95.8
1980	144.1	608.9	1.2	610.1	174.5	70.3	999.0	91.1
1981	136.1	637.6	1.2	638.8	173.6	63.5	1012.0	89.8
1982	138.9	642.8	1.1	643.9	174.2	63.4	1020.4	87.5
1983	152.0	662.0	0.9	662.9	175.8	60.9	1051.6	87.6
1984	157.0	595.5	0.7	596.2	171.2	64.0	988.4	80.1
1985	177.2	634.4	0.7	635.1	190.3	70.7	1073.3	84.7
1986	154.1	792.2	0.6	792.8	210.8	69.2	1226.9	94.5
1987	141.9	812.3	0.4	812.7	211.0	60.1	1225.7	91.8
1988	120.0	813.5	0.1	813.6	215.1	51.4	1200.1	87.2
1989	98.7	765.2	0.0	765.2	212.7	55.1	1131.7	81.9
1990	87.9	820.0	0.0	820.0	221.9	67.6	1197.4	82.8
1991	116.1	917.6	0.0	917.6	237.5	64.7	1335.9	91.0
1992	79.2	908.6	0.0	908.6	241.9	65.2	1294.9	86.8

\*Sources: Family Expenditure Survey, Digest of United Kingdom Energy Statistics



**Figure 18** Energy use of the housing stock by fuel type



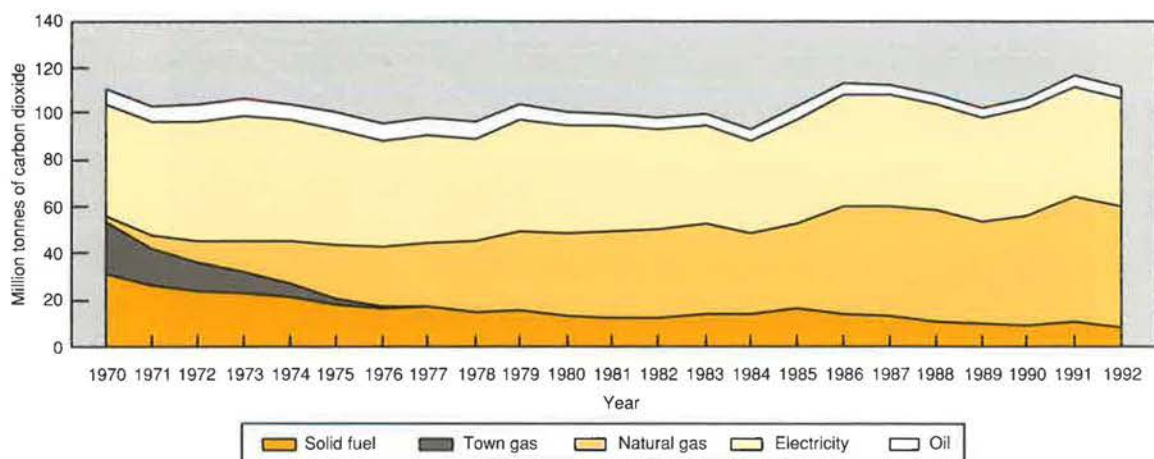
## CARBON DIOXIDE EMISSIONS

Building Research Establishment (BRE) estimates of carbon dioxide emission factors have been applied to the energy use figures of Table 18. The resulting trend shows a very stable level of carbon dioxide emissions, despite the relatively large growth in the number of owner occupied homes. There are a number of reasons for this stable level.

- The energy efficiency improvements to owner occupied homes described in this report have held energy use down.
- The move towards natural gas and away from solid fuel and oil has had a beneficial effect because of the lower emission factor associated with natural gas.
- The electricity emission factor has been steadily declining because of the improving efficiency of generation, transmission and distribution, as well as the increasing proportion of electricity derived from non-fossil fuel. The current trend towards greater electricity generation by gas should help to sustain the decline in the electricity emission factor.

**Table 19 Carbon dioxide emissions due to domestic energy consumption**

Year	Fuel type (million tonnes CO <sub>2</sub> )					All fuels	
	Solid fuels	Natural gas	Town gas	Electric	Oil	Total (million tonnes CO <sub>2</sub> )	Per household (tonnes CO <sub>2</sub> )
1970	31.1	2.7	22.2	47.7	6.8	110.5	12.5
1971	26.6	6.0	15.6	47.9	6.6	102.7	11.3
1972	23.5	9.7	12.6	50.6	7.6	104.0	11.1
1973	23.1	13.6	8.7	53.2	8.4	107.1	11.1
1974	21.7	18.3	5.7	51.4	7.4	104.5	10.7
1975	18.3	22.7	2.7	49.4	7.1	100.1	10.0
1976	16.8	25.3	0.8	45.6	7.1	95.6	9.4
1977	17.1	27.5	0.2	46.0	7.2	97.9	9.4
1978	15.3	30.1	0.1	43.9	7.0	96.4	9.2
1979	15.4	34.2	0.1	47.6	6.8	104.2	9.7
1980	13.5	35.3	0.1	45.7	5.5	100.0	9.1
1981	12.7	36.9	0.1	45.0	4.9	99.6	8.8
1982	12.9	37.2	0.1	43.0	4.9	98.2	8.4
1983	14.2	38.3	0.1	42.4	4.7	99.8	8.3
1984	14.5	34.5	0.1	39.3	5.0	93.3	7.6
1985	16.3	36.7	0.1	44.0	5.5	102.7	8.1
1986	14.2	45.9	0.0	48.2	5.4	113.7	8.8
1987	13.3	47.0	0.0	47.8	4.7	112.8	8.4
1988	11.2	47.1	0.0	46.3	4.0	108.6	7.9
1989	9.2	44.3	0.0	44.5	4.3	102.3	7.4
1990	8.3	47.5	0.0	45.9	5.3	106.9	7.4
1991	10.8	53.1	0.0	47.3	5.0	116.3	7.9
1992	7.6	52.6	0.0	46.7	5.1	112.0	7.5



**Figure 19** Carbon dioxide emissions due to domestic energy consumption

## SOURCES

Several statistical sources have been referred to while compiling the domestic energy fact files for the individual tenures. The relevant sources are quoted below individual tables, and are listed in full in this section. In most cases, several editions of these sources have been consulted.

Some tables simply quote their source as *BREHOMES*. For these tables, a fuller explanation of the derivation of the figures can be obtained from the text accompanying the equivalent tables in the main domestic energy fact file<sup>1</sup>.

- **Department of the Environment, Scottish Development Department, Welsh Office.** *Housing and Construction Statistics. Great Britain.* London, HMSO, published annually.
- **Department of Trade and Industry.** *Digest of United Kingdom Energy Statistics.* London, HMSO, published annually.
- **Department of Employment.** *Family Expenditure Survey.* London, HMSO, published annually.
- **Office of Population Censuses and Surveys.** *General Household Survey.* London, HMSO, published annually.
- **GfK Marketing Services Ltd.** *GfK Home Audit.* Home heating and insulation reports are produced annually.

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- 1 **Shorrocks L D, Henderson G and Bown J H F.** *Domestic energy fact file.* Building Research Establishment Report. Garston, BRE, 1992.
- 2 **Shorrocks L D and Bown J H F.** *Domestic energy fact file: 1993 update.* Building Research Establishment Report. Garston, BRE, 1993 (supplement to 1992 report).
- 3 **Dunster J E, Michel I, Shorrocks L D and Bown J H F.** *Domestic energy fact file: local authority homes.* Building Research Establishment Report. Garston, BRE, 1994.
- 4 **Dunster J E, Michel I, Shorrocks L D and Bown J H F.** *Domestic energy fact file: private rented homes.* Building Research Establishment Report. Garston, BRE, 1994.
- 5 **Office of Population Censuses and Surveys.** *1991 census. Report for Great Britain. Part 1.* London, HMSO, 1993.







