

Domestic energy fact file: local authority homes

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INTRODUCTION

The aim of this report

This report provides information on energy use and energy efficiency in local authority homes. It presents tables, graphs and charts equivalent to those in the domestic energy fact files which cover all tenures^{1,2}. Two companion reports covering owner occupied³ and private rented⁴ 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 local authority homes, it also draws comparisons with owner occupied 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 local authority 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^{1,2}). 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 file¹ 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 local authority homes and those of owner occupied homes or homes in general.

Most — but not all — of the tables in the original domestic energy fact files^{1,2} 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 local authority 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 file¹. 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 local authority households spend only slightly less than owner occupied households on fuel, light and power, but substantially less on all goods. The expenditure of local authority households on fuel, light and power, expressed as a percentage of their expenditure on all goods, is therefore considerably higher than in owner occupied households. The gap between local authority household expenditure on all goods, and owner occupied household expenditure on all goods, has been steadily widening.

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 over the period^{1,2}. 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: local authority			1989 prices: owner occupiers		
	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	100.18	6.97	154.29	10.73	7.0	224.76	12.26	5.5
1982	101.21	7.61	143.59	10.80	7.5	225.43	12.97	5.8
1983	102.96	8.23	139.71	11.17	8.0	229.37	13.72	6.0
1984	100.61	8.65	129.94	11.17	8.6	237.01	13.03	5.5
1985	107.16	9.10	130.50	11.08	8.5	237.94	13.01	5.5
1986	106.11	9.39	124.99	11.06	8.8	256.32	13.27	5.2
1987	112.63	9.71	127.33	10.98	8.6	258.16	12.67	4.9
1988	119.10	9.40	128.35	10.13	7.9	262.48	11.99	4.6
1989	132.28	10.08	132.28	10.08	7.6	264.92	11.04	4.2
1990	148.03	10.32	135.23	9.43	7.0	264.66	10.67	4.0
1991	140.38	11.10	119.35	9.44	7.9	261.69	11.06	4.2
1992	151.53	12.00	126.04	9.98	7.9	269.16	11.41	4.2

*Source: *Family Expenditure Survey*

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

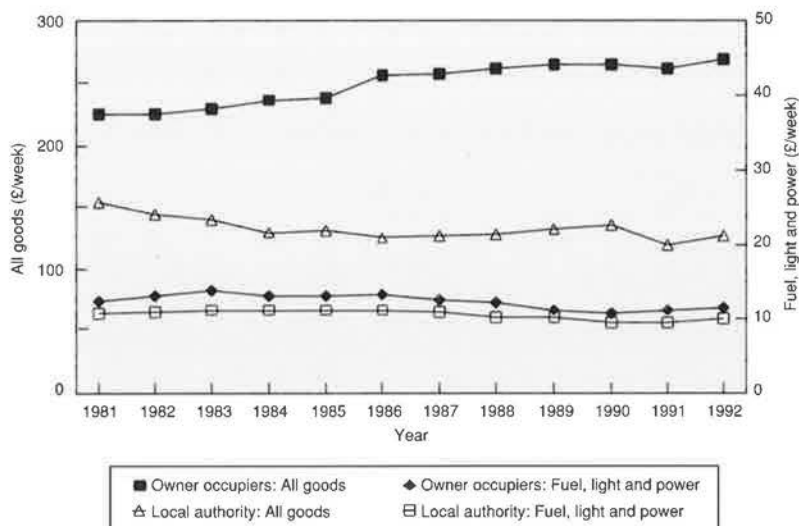


Figure 1 Average weekly expenditures on all goods, fuel, light and power at 1989 prices

HOUSEHOLDS AND HOUSEHOLD SIZE

Table 2 shows figures for the number of local authority households and the mean household size for this tenure. The mean household size for owner occupied tenure is also shown. Figure 2 shows that local authority mean household sizes tend to be slightly the smaller of the two. By multiplying the number of households by the mean household size, it is possible to estimate what percentage of the population was living in local authority households in any one year. For example, this calculation indicates that, in 1991, about 20% of the household population lived in local authority homes. The 1991 census⁵ also shows about 20% living in local authority homes.

The numbers of local authority 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	
		Local authority	Owner occupied
1972	5553		
1973†	5600	2.92	2.93
1974	5720		
1975†	5835	2.86	2.89
1976	5964		
1977	6083	2.78	2.81
1978	6126		
1979†	6155	2.62	2.77
1980	6135		
1981	6084	2.73	2.81
1982	5904		
1983	5772	2.56	2.79
1984	5672	2.43	2.77
1985	5586	2.41	2.71
1986	5502	2.39	2.69
1987	5339	2.34	2.70
1988	5167	2.27	2.62
1989	5198	2.28	2.66
1990	4817	2.28	2.59
1991	4739	2.33	2.59
1992	4663	2.24	2.57

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

General Household Survey (mean household size)

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

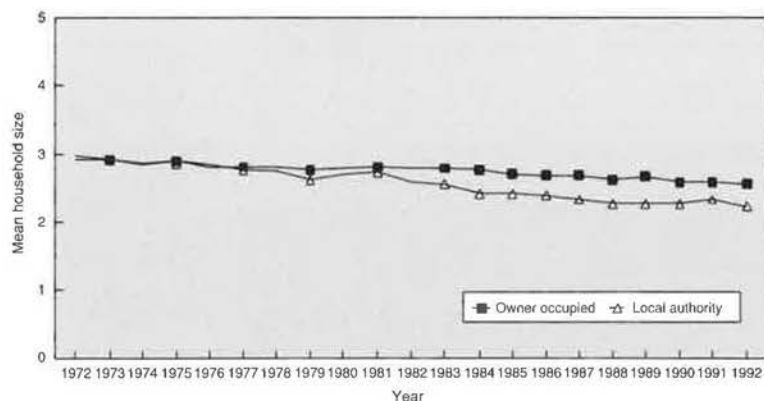


Figure 2 Mean household size

AGE OF THE HOUSING STOCK

The current distribution of local authority homes is fairly even between all but one of the different age categories. The exception is the 'pre-1918' category: less than 4% of local authority dwellings were built before 1918. This bias towards newer homes is part of the reason why the heat loss of the average local authority home is lower than the overall average (see Table 12). However, the main reason for this relatively low heat loss is the way that local authority dwellings are distributed between the different dwelling types (see Table 4).

The age categories used for this report and its companions are not the same as those used for the original domestic energy fact file. 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	265	1205	2547	1425	684	6126
1979	234	1244	2150	1648	879	6155
1980	271	1340	2165	1458	901	6135
1981	310	1243	2217	1397	917	6084
1982	337	1298	1916	1329	1024	5904
1983	234	1196	1988	1362	992	5772
1984	167	1131	2009	1382	983	5672
1985	211	1089	1863	1342	1081	5586
1986	176	1121	1906	1294	1005	5502
1987	165	1134	1864	1212	966	5339
1988	126	1025	1735	1172	1109	5167
1989	155	1061	1706	1097	1179	5198
1990	196	1111	1651	978	881	4817
1991	130	997	1607	1045	960	4739
1992	163	895	1565	1117	923	4663

*Source: *GfK Home Audit*

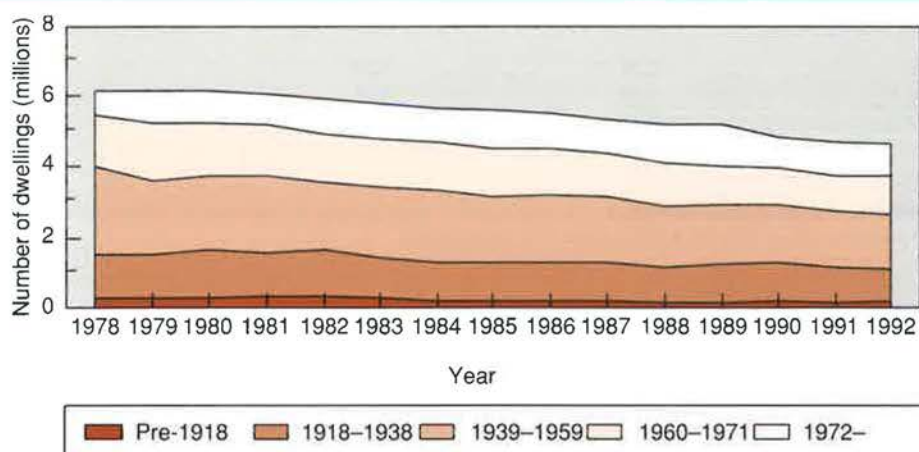


Figure 3 Housing stock distribution by age

HOUSE TYPES

The distribution of local authority homes between the different types of dwelling is quite different from the distribution of owner occupied homes between different dwelling types³. In particular, the local authority housing stock contains a very high proportion of flats, and an extremely low proportion of detached houses. For a given standard of insulation, a detached house will have the highest heat loss, and a flat will have the lowest heat loss, of all house types. Consequently, the average local authority home has a lower heat loss than the average for all homes (see Table 12). This is in spite of the fact that insulation standards tend to be relatively worse in local authority homes (as discussed in subsequent sections of this report).

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

Year	Semi-detached	Terrace	Flat	Detached	Bungalow	Other	Total houses
1976	1868	1714	2084	23	227	48	5964
1977	1964	1826	1970	21	252	50	6083
1978	2091	1903	1798	52	229	53	6126
1979	2013	1879	1838	36	356	33	6155
1980	2073	1771	1809	56	380	46	6135
1981	1903	1879	1832	66	347	57	6084
1982	1785	1806	1799	73	364	77	5904
1983	1643	1734	1969	31	368	27	5772
1984	1612	1735	1833	58	385	49	5672
1985	1617	1640	1796	59	427	47	5586
1986	1507	1813	1731	24	393	34	5502
1987	1472	1649	1804	41	342	31	5339
1988	1340	1535	1869	30	384	9	5167
1989	1358	1357	2064	67	340	12	5198
1990	1344	1477	1754	18	213	11	4817
1991	1235	1252	1862	14	364	12	4739
1992	1250	1281	1895	49	182	6	4663

*Source: GfK Home Audit

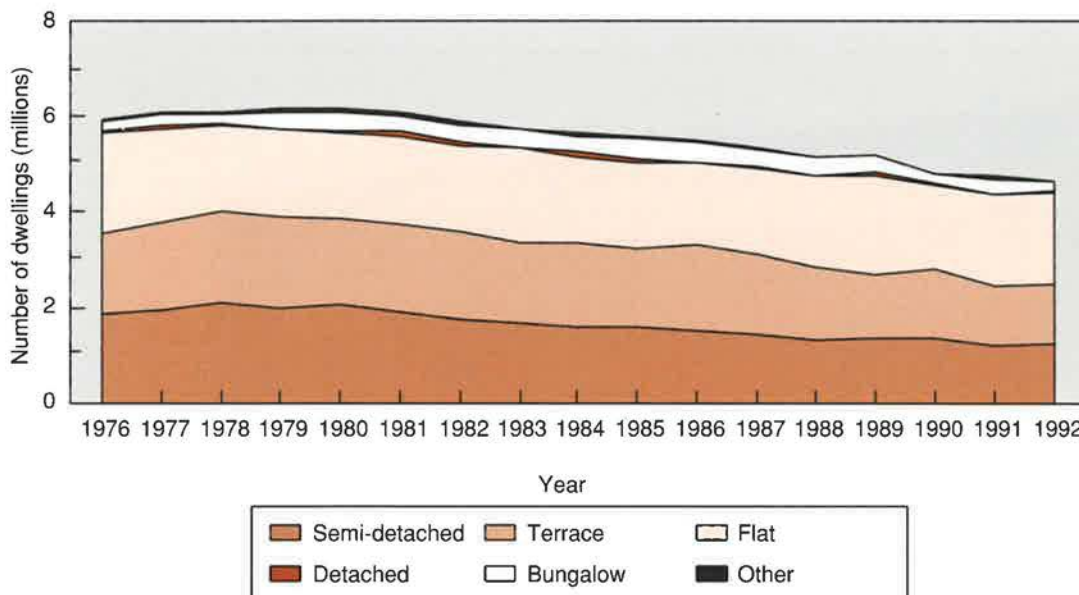


Figure 4 Housing stock distribution by type of dwelling

REGIONAL DISTRIBUTION OF THE HOUSING STOCK

Regional distribution of the housing stock does not vary markedly with tenure. The main difference between the local authority and owner occupied 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 local authority 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	4272		257								873	5402
1971	4349		261								898	5508
1972	4377		260								916	5553
1973	4406		261								933	5600
1974	4509		264								947	5720
1975	4602		270								963	5835
1976	4711		276								977	5964
1977	4810		282								991	6083
1978	4850		284								992	6126
1979	4870	341	285	1635	178	572	394	600	696	454	1000	6155
1980	4852	343	286	1611	179	579	393	593	694	459	998	6135
1981	4794	348	277	1632	180	561	386	574	669	444	1013	6084
1982	4629	331	270	1595	173	545	363	554	646	421	1006	5904
1983	4519	324	256	1559	168	536	353	540	627	411	998	5772
1984	4447	319	250	1531	165	530	348	532	621	402	974	5672
1985	4376	314	245	1507	162	522	342	524	609	396	965	5586
1986	4304	309	241	1468	161	518	339	520	598	391	957	5502
1987	4170	294	236	1420	153	502	326	506	586	383	933	5339
1988	4036	282	227	1364	148	489	315	491	574	373	904	5167
1989	4113	292	230	1390	152	497	322	498	583	379	855	5198
1990	3805	272	214	1261	141	465	304	465	543	353	799	4817
1991	3751	268	211	1246	136	456	302	460	535	347	778	4739
1992	3692	260	207	1232	134	450	297	454	525	340	764	4663

*Source: *Housing and Construction Statistics*

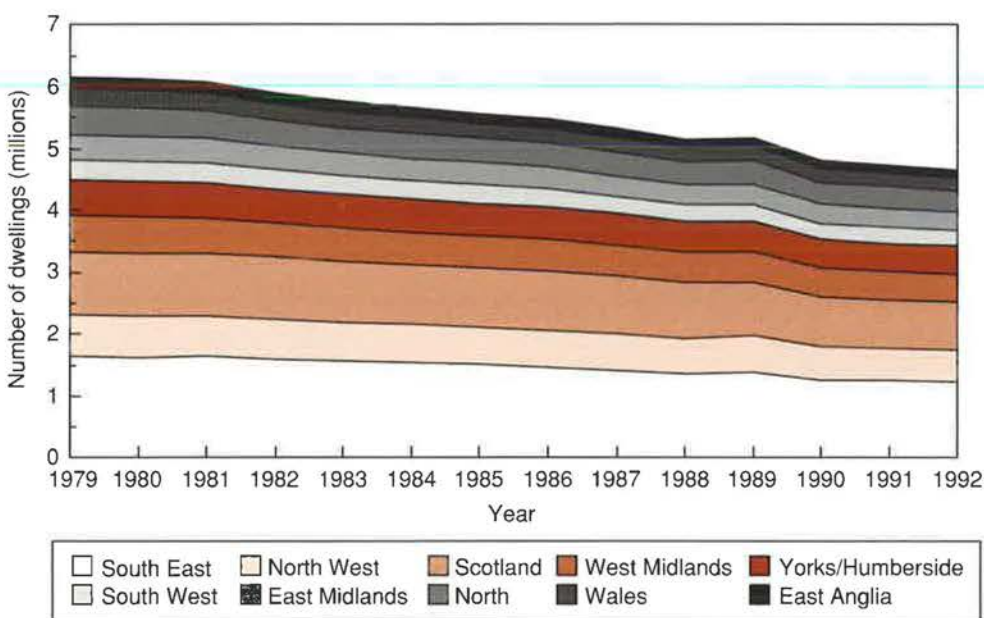


Figure 5 Housing stock distribution by region

LOFT INSULATION

Uptake of loft insulation in local authority households used to be lower than in owner occupied households, but has now almost caught up. The current proportion of local authority households with accessible lofts which have loft insulation is 89.7%. This is only slightly lower than the corresponding figure for owner occupied households (92.3%). However, loft insulation in local authority homes is noticeably less deep than in owner occupied homes.

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

Year	Depth of insulation					Not stated	Local authority houses		
	<1 in	1 in	2 in	3 in	≥4 in		Total with insulation	Potential	Total houses
1974	0	0	0	0	0	982	982	3810	5720
1975	0	0	0	0	0	1084	1084	3931	5835
1976	104	178	440	212	30	268	1231	3827	5964
1977	141	314	499	344	58	214	1570	3914	6083
1978	134	264	558	515	128	228	1828	4107	6126
1979	85	244	753	734	222	448	2487	4222	6155
1980	79	219	870	934	326	345	2773	4343	6135
1981	77	307	954	838	457	376	3010	4220	6084
1982	75	179	957	1019	600	457	3287	4218	5904
1983	52	196	713	991	889	423	3264	3938	5772
1884	42	120	725	1010	1004	369	3271	3992	5672
1985	30	194	680	802	1071	552	3329	3886	5586
1986	36	213	645	969	1055	448	3365	3839	5502
1987	63	201	542	845	1147	435	3234	3633	5339
1988	29	140	501	622	1141	467	2900	3358	5167
1989	20	141	468	744	981	449	2803	3229	5198
1990	26	145	557	789	1010	422	2949	3298	4817
1991	29	149	408	685	854	408	2534	3055	4739
1992	44	77	447	582	1057	496	2703	3012	4663

*Source: GfK Home Audit

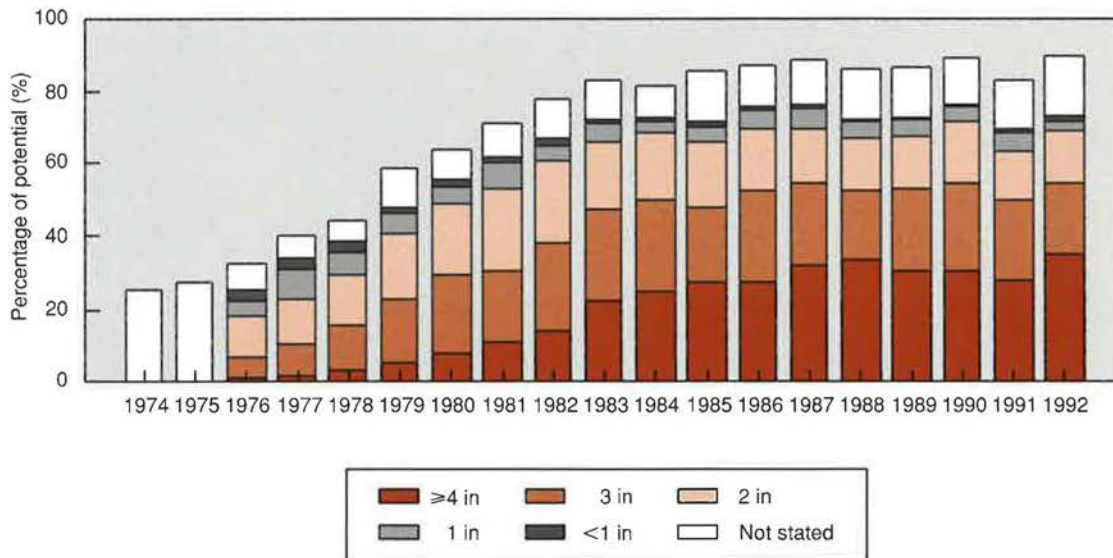


Figure 6 Ownership and depth of loft insulation

CAVITY WALL INSULATION

Uptake of cavity wall insulation in local authority homes has followed a similar trend to that for owner occupied homes, but with a lower overall ownership level. Currently, 19% of local authority homes with cavity walls have had them insulated. The corresponding figure for owner occupied homes is 26%.

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

Year	Houses with cavity insulation	Potential	Total houses
1974	72	3245	5720
1975	98	3323	5835
1976	134	3359	5964
1977	153	3253	6083
1978	146	3295	6126
1979	261	4046	6155
1980	304	5273	6135
1981	223	5101	6084
1982	353	4902	5904
1983	381	4722	5772
1984	540	4868	5672
1985	588	4497	5586
1986	521	4525	5502
1987	617	4240	5339
1988	575	4258	5167
1989	721	4311	5198
1990	711	3856	4817
1991	557	3820	4739
1992	721	3795	4663

*Source: GfK Home Audit

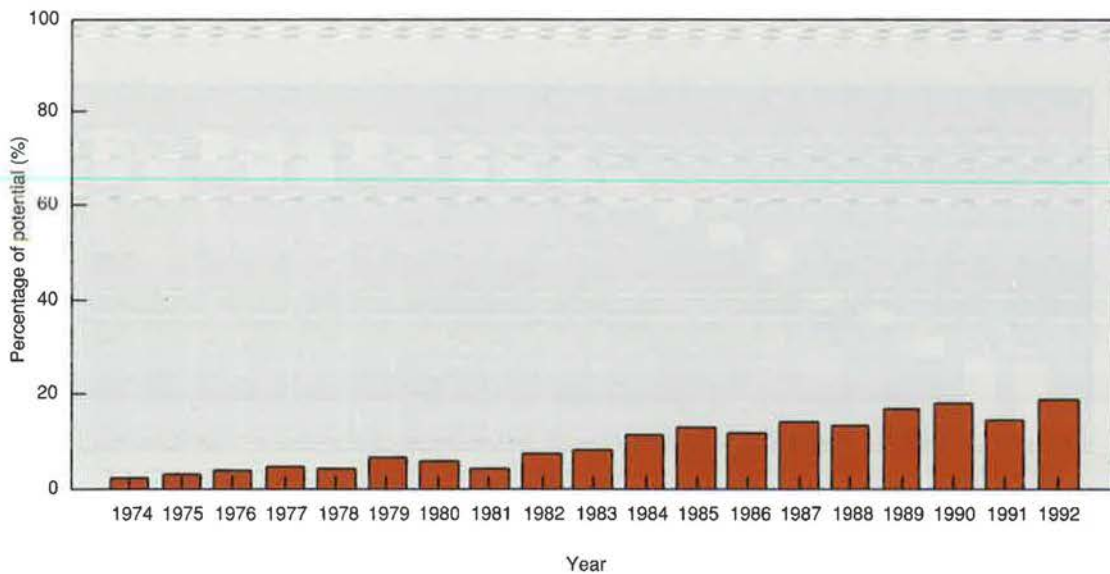


Figure 7 Ownership of cavity wall insulation

DOUBLE GLAZING

Double glazing has shown a very poor uptake in local authority homes. Currently, only 24% of local authority homes have some double glazing. By contrast, over 65% of owner occupied homes have some double glazing.

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

Year	Percentage of rooms treated					Not stated	Local authority houses	
	<20%	20-39%	40-59%	60-79%	≥80%		Total with double glazing	Potential
1974	0	0	0	0	0	153	153	5720
1975	0	0	0	0	0	170	170	5835
1976	0	0	0	0	0	178	178	5964
1977	0	0	0	0	0	216	216	6083
1978	0	0	0	0	0	223	223	6126
1979	0	0	0	0	0	329	329	6155
1980	0	0	0	0	0	296	296	6135
1981	0	0	0	0	0	314	314	6084
1982	0	0	0	0	0	246	246	5904
1983	0	0	0	0	0	334	334	5772
1984	55	70	45	38	54	12	274	5672
1985	77	83	70	51	112	65	458	5586
1986	90	69	79	69	77	18	402	5502
1987	85	105	73	88	153	5	509	5339
1988	82	100	116	121	198	61	678	5167
1989	95	65	117	143	296	45	761	5198
1990	54	98	125	177	473	66	993	4817
1991	94	157	128	237	539	52	1207	4739
1992	114	106	120	217	490	59	1106	4663

*Source: GfK Home Audit

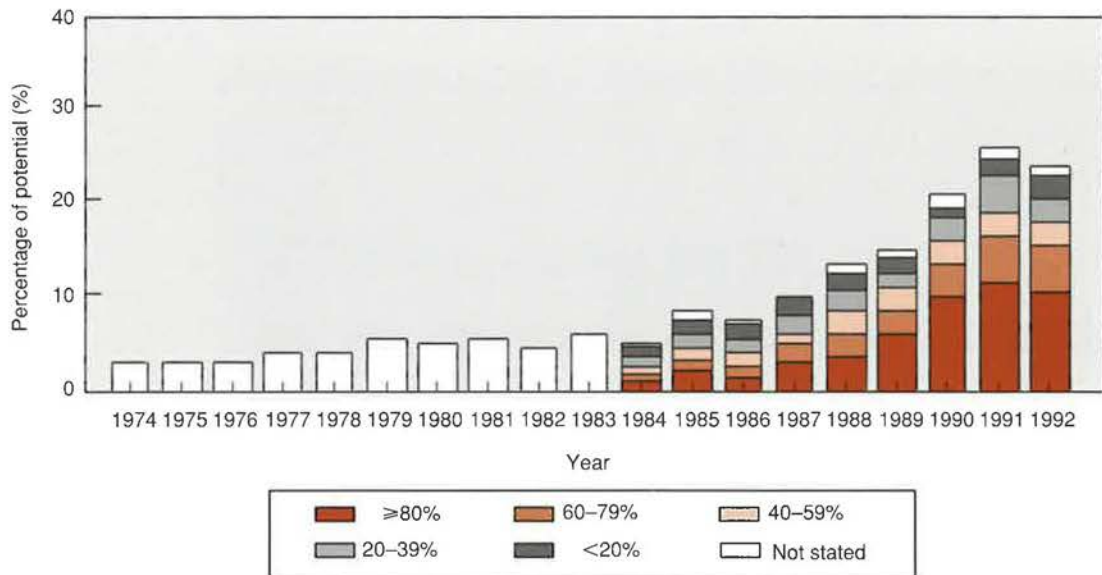


Figure 8 Ownership of double glazing

DRAUGHT STRIPPING

Draught stripping in local authority homes shows no obvious trends. However, it is notable that draught stripping is more common in local authority homes than it is in owner occupied homes. In 1992 about 39.8% of local authority homes had some draught stripping. The corresponding figure for owner occupied homes was 30.9%.

It is also interesting that the recent general decline in ownership across all tenures is not reflected in the local authority figures. As noted in the main domestic energy fact file¹, the reason for this decline could well be the increasing ownership of double glazing; good quality double glazing incorporates integral draught seals, so draught stripping such windows is unnecessary. However, since double glazing has not been strongly taken up in local authority homes, ownership of draught stripping in this sector has not shown this general decline.

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

Year	Percentage of rooms treated						Local authority houses	
	<20%	20-39%	40-59%	60-79%	≥80%	Not stated	Total with draught stripping	Potential
1983	502	654	191	75	186	63	1671	5772
1984	415	631	189	113	185	5	1538	5672
1985	487	715	267	144	335	0	1948	5586
1986	546	766	269	170	380	0	2131	5502
1987	480	750	232	170	416	0	2048	5539
1988	432	725	278	148	397	0	1980	5167
1989	382	731	211	153	385	0	1862	5198
1990	372	607	230	138	417	0	1764	4817
1991	377	690	261	180	354	0	1862	4739
1992	390	681	227	166	394	0	1858	4663

*Source: GfK Home Audit

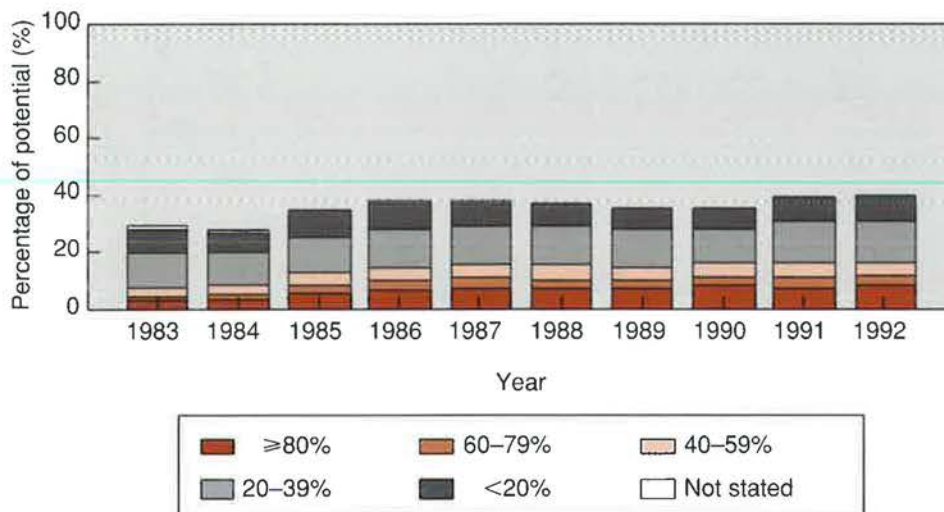


Figure 9 Ownership of draught stripping

HOT WATER TANK INSULATION

Uptake of hot water tank insulation in local authority homes used to be lower than in owner occupied homes, but has now almost caught up. About 91% of local authority homes with hot water tanks currently have tank insulation. The corresponding figure for owner occupied homes is about 96%.

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

Year	Depth of insulation					Not stated	Local authority houses		
	≤1 in	2 in	3 in	≥3 in	>3 in		Total with insulation	Potential	Total houses
1976	849	1358		662		482	3351	5298	5964
1977	1091	1347		650		690	3778	5333	6083
1978	945	1456	636		188	702	3927	5336	6126
1979	1201	1655	620		170	388	4034	5271	6155
1980	1036	2003	998		205	271	4513	5636	6135
1981	1127	1781	916		264	294	4382	5375	6084
1982	1079	1889	876		224	289	4357	5208	5904
1983	993	1900	862		306	310	4371	5109	5772
1984	915	1798	958		345	402	4411	5134	5672
1985	825	1865	1225		313	440	4668	5184	5586
1986	792	1850	1036		301	544	4523	5081	5502
1987	830	1572	1163		413	543	4521	4977	5339
1988	723	1668	966		470	577	4404	4900	5167
1989	709	1520	1022		384	764	4399	4812	5198
1990	719	1366	993		354	612	4044	4504	4817
1991	615	1301	993		350	767	4026	4426	4739
1992	452	1175	934		453	819	3833	4207	4663

*Source: GfK Home Audit

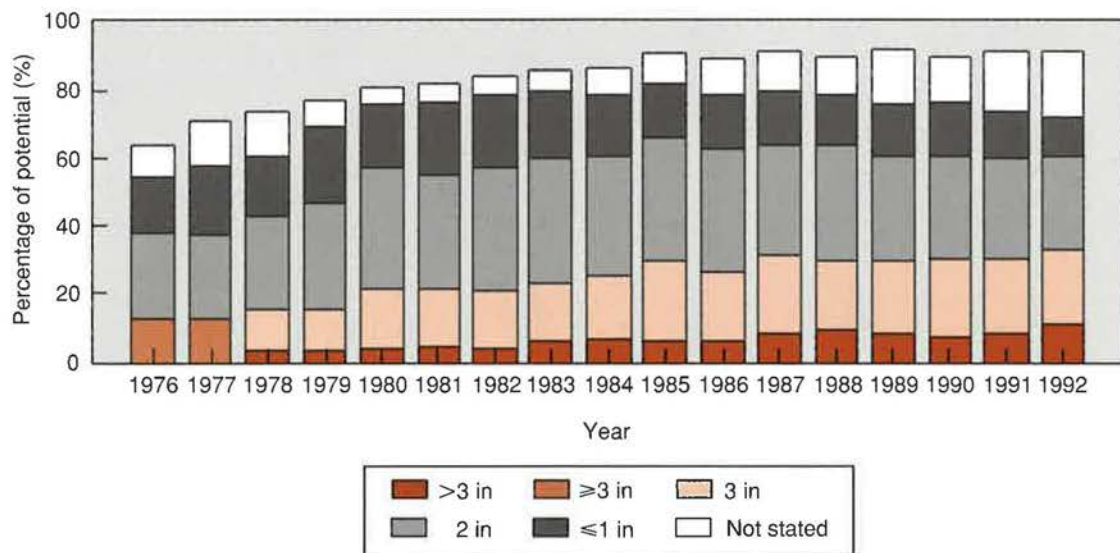


Figure 10 Ownership of hot water tank insulation

ENERGY CONSUMPTION AND EXTERNAL TEMPERATURES

Energy consumption of local authority homes rose slightly up to 1980 but has since shown a marked decline. This trend follows the corresponding rise and then fall in the number of local authority homes. The average consumption per dwelling has remained relatively stable throughout, at a level around 20% lower than for owner occupied 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 local authority dwelling (GJ)
	Local authority	All tenures	Local authority	All tenures		
1970	5402	17759	412.5	1502	5.8	76.4
1971	5508	17990	400.6	1453	6.7	72.7
1972	5553	18192	405.9	1482	6.4	73.1
1973	5600	18367	417.7	1531	6.1	74.6
1974	5720	18545	425.3	1544	6.7	74.4
1975	5835	18747	416.5	1503	6.4	71.4
1976	5964	18971	415.8	1488	5.8	69.7
1977	6083	19203	432.6	1539	6.6	71.1
1978	6126	19401	440.3	1572	6.3	71.9
1979	6155	19575	469.3	1686	5.1	76.2
1980	6135	19756	444.3	1620	5.8	72.1
1981	6084	19921	434.3	1615	5.4	71.4
1982	5904	20067	426.1	1592	5.8	72.2
1983	5772	20225	394.9	1585	6.2	68.4
1984	5672	20402	402.8	1541	5.8	71.0
1985	5586	20580	454.7	1696	4.8	81.4
1986	5502	20760	404.8	1768	5.2	73.6
1987	5339	20945	400.1	1760	4.9	74.9
1988	5167	21138	358.4	1708	6.3	69.4
1989	5198	21340	365.2	1638	6.9	70.3
1990	4817	21531	324.1	1653	7.6	67.3
1991	4739	21698	336.4	1822	6.1	71.0
1992	4663	21932	328.6	1782	6.1	70.5

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

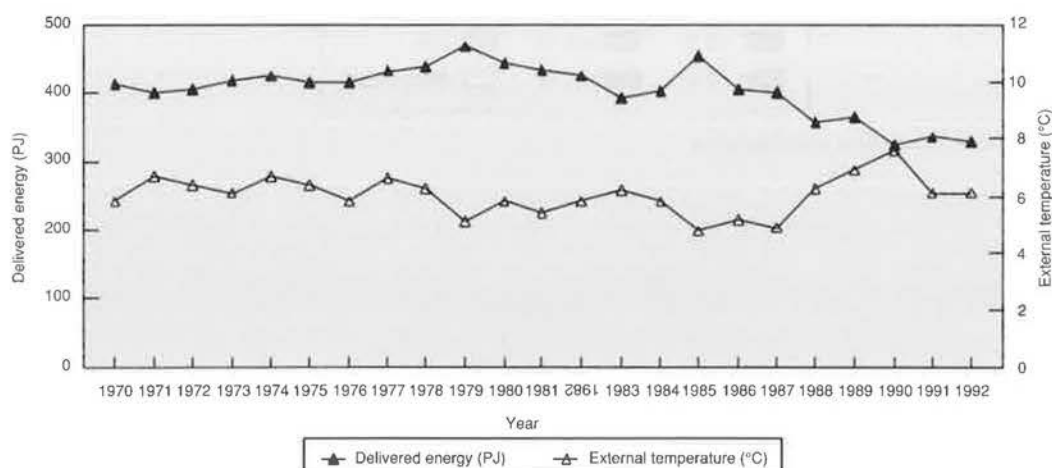


Figure 11 Domestic energy consumption and external temperatures

HEAT LOSS OF THE AVERAGE LOCAL AUTHORITY DWELLING

The heat loss of the average local authority home is substantially lower than that for the average across all tenures, although the change over the years is similar. This is because, although insulation standards tend to be worse in local authority homes, the distribution of house types is biased towards more flats and fewer detached houses (as discussed in a previous section of this report). Another factor which keeps heat losses lower than average is that the local authority stock contains very few houses built before 1918.

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 local authority figures.

Table 12 Heat loss of the average local authority dwelling*

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

*Source: BREHOMES

†Figures for these years are interpolated

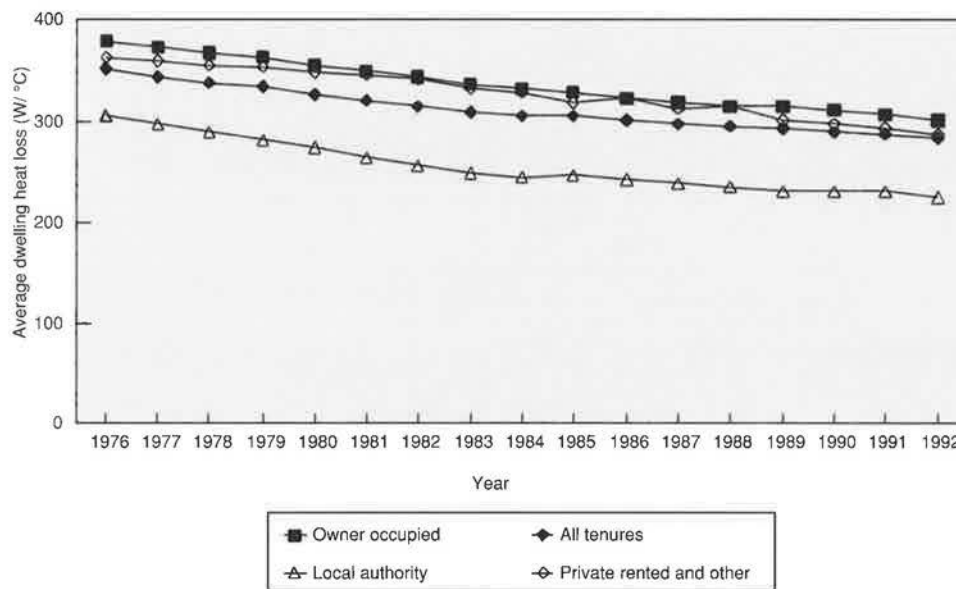


Figure 12 Heat loss of the average owner occupied dwelling

CENTRAL HEATING OWNERSHIP

Central heating is less common in local authority homes than in owner occupied homes, but it has still shown a very strong uptake. By 1992, over 77% of local authority homes had central heating. The corresponding figure for owner occupied homes was just over 86%.

Table 13 Central heating ownership*

Year	Local authority houses (1000s)			Percentage of households with central heating	
	No central heating	Central heating	Total houses	Local authority	Owner occupied
1977	3281	2802	6083	46.1	64.5
1978	3353	2773	6126	45.3	65.2
1979	3202	2953	6155	48.0	67.2
1980	2928	3207	6135	52.3	68.0
1981	3004	3080	6084	50.6	69.8
1982	2798	3106	5904	52.6	70.8
1983	2590	3182	5772	55.1	75.6
1984	2332	3340	5672	58.9	76.9
1985	2120	3466	5586	62.1	77.8
1986	2085	3417	5502	62.1	79.7
1987	1820	3519	5339	65.9	80.5
1988	1741	3426	5167	66.3	82.0
1989	1551	3647	5198	70.2	83.9
1990	1349	3468	4817	72.0	84.2
1991	1094	3645	4739	76.9	85.7
1992	1035	3628	4663	77.8	86.7

*Source: GfK Home Audit

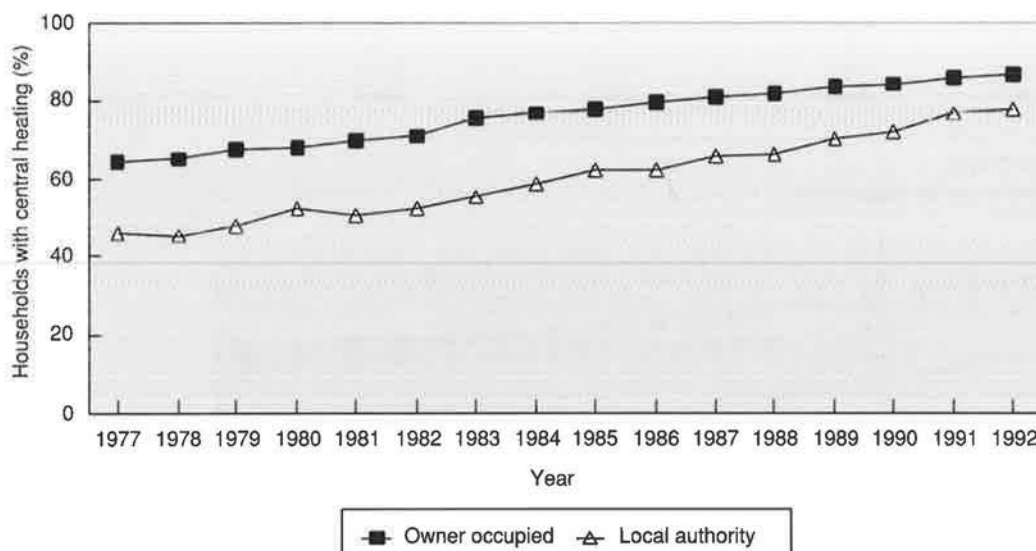


Figure 13 Central heating ownership

HEATING APPLIANCES

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

Electric central heating accounted for just over 12% of systems in local authority homes, but just under 9% in owner occupied homes. Solid fuel heating is also quite common 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	354	901			1284			234	2773
1979	327	800			1578			248	2953
1980	450	879			1687			191	3207
1981	390	778	269	509	1677	35	200		3080
1982	409	682	251	431	1820	13	182		3106
1983	389	742	285	457	1850	26	175		3182
1984	419	697	310	387	1966	22	236		3340
1985	443	632	306	326	2107	22	262		3466
1986	498	501	262	239	2235	18	165		3417
1987	477	539	282	257	2274	20	209		3519
1988	478	523	309	214	2231	38	156		3426
1989	372	630	370	260	2444	12	189		3647
1990	402	541	369	172	2336	15	174		3468
1991	401	547	389	158	2535	22	140		3645
1992	321	561	406	155	2564	17	165		3628

*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	1187	526	1462			178	3353
1979	1015	526	1471			190	3202
1980	970	416	1345			197	2928
1981†	983	436	1355			230	3004
1982†	856	438	1283			221	2798
1983	657	422	1409	31	71		2590
1984†	616	407	1244	19	46		2332
1985†	573	322	1169	9	47		2120
1986	477	255	1285	8	60		2085
1987	364	245	1153	7	51		1820
1988	302	280	1093	11	55		1741
1989	285	231	976	9	50		1551
1990	291	195	828	2	33		1349
1991	216	130	695	6	47		1094
1992	181	139	667	4	44		1035

*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 update². Data are given for local authority homes and owner occupied homes. The heating efficiency is slightly lower in local authority 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 high proportion of local authority 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	
			Local authority	Owner occupied
1977†	72	46	55	58
1978	72	45	55	59
1979	71	48	57	60
1980	72	48	58	61
1981	71	48	57	62
1982	70	50	59	62
1983	71	51	60	63
1984	71	51	61	64
1985	70	50	61	64
1986	69	51	61	63
1987	69	51	62	64
1988	69	53	63	64
1989	70	52	63	64
1990	69	51	63	65
1991	69	51	64	65
1992	69	52	65	65

*Source: BREHOMES

†Figures for this year have been extrapolated

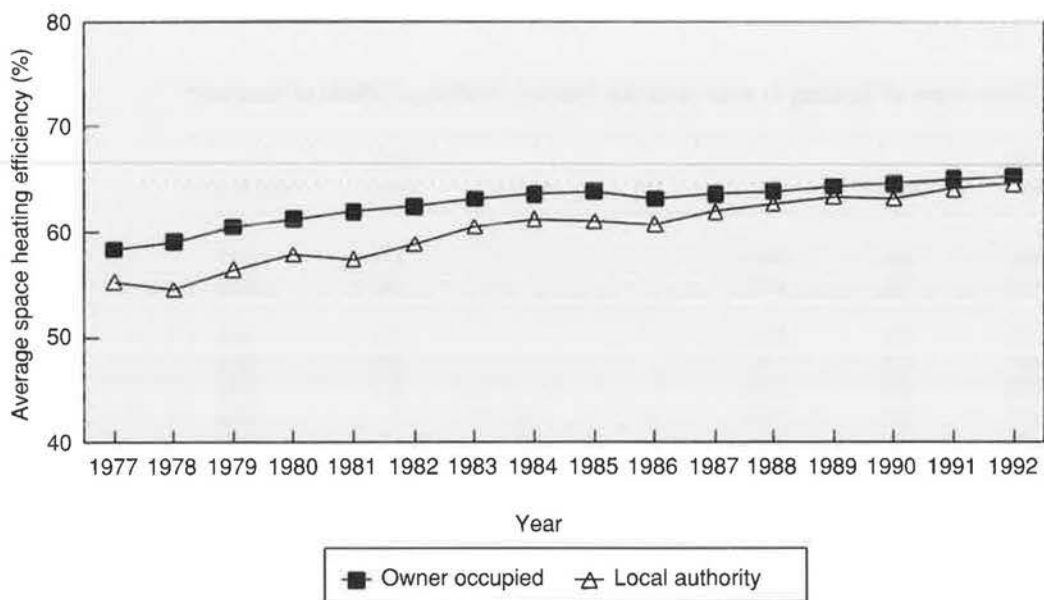


Figure 15 Weighted average space heating efficiencies

STANDARDS OF COMFORT

The main domestic energy fact files^{1,2} 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 local authority homes, and compares them with estimates for owner occupied 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 file². The overall average has been calculated from these temperatures, knowing the numbers of local authority homes with and without central heating. As might be expected, this indicates that local authority homes tend to be slightly cooler than owner occupied 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)
		Local authority	Owner occupied		
1977	46.1	14.24	14.70	6.6	6083
1978	45.3	14.16	14.66	6.3	6126
1979	48.0	13.71	14.19	5.1	6155
1980	52.3	14.38	14.77	5.8	6135
1981	50.6	14.00	14.47	5.4	6084
1982	52.6	14.42	14.87	5.8	5904
1983	55.1	14.92	15.43	6.2	5772
1984	58.9	14.40	14.85	5.8	5672
1985	62.1	14.22	14.61	4.8	5586
1986	62.1	15.00	15.44	5.2	5502
1987	65.9	14.69	15.05	4.9	5339
1988	66.3	15.88	16.27	6.3	5167
1989	70.2	16.12	16.47	6.9	5198
1990	72.0	16.93	17.24	7.6	4817
1991	76.9	16.54	16.76	6.1	4739
1992	77.8	16.74	16.97	6.1	4663

*Source: BREHOMES

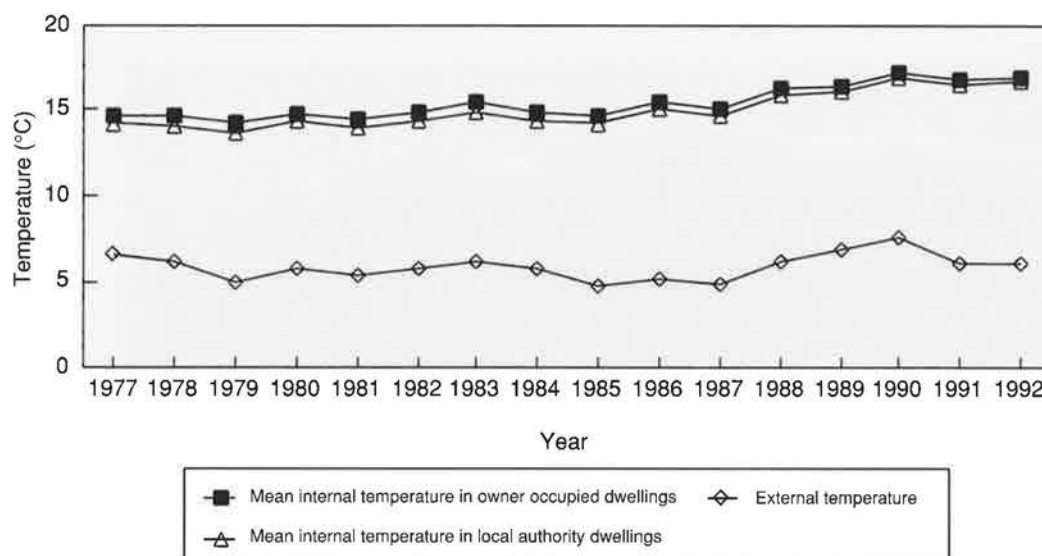


Figure 16 Standards of comfort: mean internal and average winter external temperatures

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 local authority 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^{3,4}. 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	247.4	111.8	24.0	29.2	412.5	45.8
1971	235.2	109.8	25.9	29.7	400.6	42.7
1972	241.9	106.4	28.0	29.7	405.9	43.6
1973	251.0	107.2	29.8	29.7	417.7	44.8
1974	256.8	106.4	32.0	30.1	425.3	44.9
1975	247.0	104.9	34.1	30.6	416.5	42.3
1976	241.0	107.8	35.9	31.1	415.8	40.4
1977	253.3	110.0	37.8	31.5	432.6	41.6
1978	259.1	110.4	39.1	31.7	440.3	42.3
1979	286.9	110.5	40.2	31.7	469.3	46.6
1980	267.7	104.6	40.9	31.1	444.3	43.6
1981	260.3	102.4	41.3	30.4	434.3	42.8
1982	251.3	102.7	42.3	29.9	426.1	42.6
1983	231.2	96.4	40.2	27.1	394.9	40.1
1984	233.2	98.8	43.1	27.6	402.8	41.1
1985	276.5	105.7	45.3	27.2	454.7	49.5
1986	251.3	91.6	39.6	22.3	404.8	45.7
1987	247.2	91.5	40.1	21.3	400.1	46.3
1988	216.0	85.7	37.7	18.9	358.4	41.8
1989	213.7	91.3	40.8	19.4	365.2	41.1
1990	189.3	81.4	36.7	16.6	324.1	39.3
1991	208.7	77.1	35.2	15.4	336.4	44.0
1992	200.8	77.1	35.6	15.2	328.6	43.1

*Source: BREHOMES

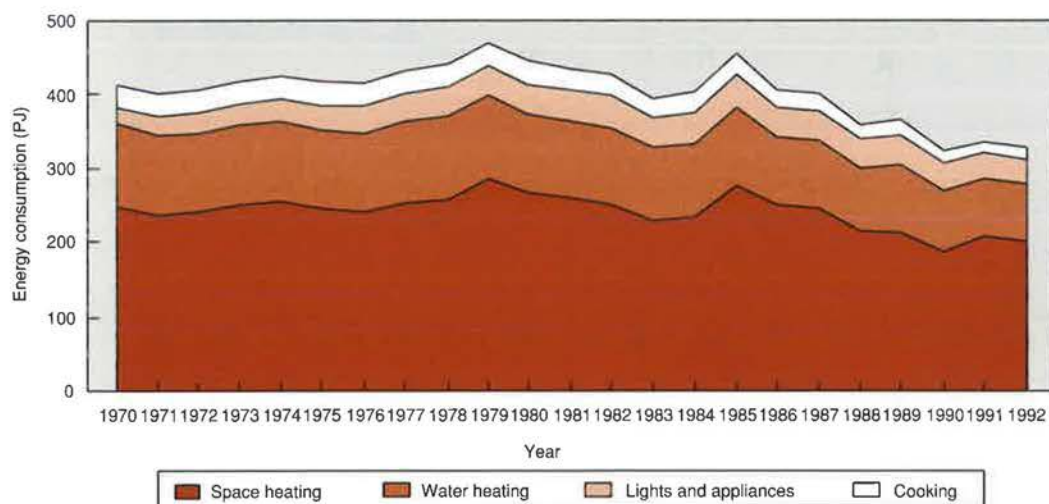


Figure 17 Domestic energy consumption by end use

DOMESTIC ENERGY CONSUMPTION BY FUEL

The total energy use figures for local authority 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, 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 local authority 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	226.9	14.4	66.7	81.1	75.7	28.8	412.5	76.4
1971	198.3	33.4	59.0	92.4	80.9	29.0	400.6	72.7
1972	176.7	54.6	52.7	107.3	88.2	33.7	405.9	73.1
1973	173.4	76.4	37.8	114.2	93.0	37.1	417.7	74.6
1974	165.9	105.0	25.1	130.1	95.7	33.6	425.3	74.4
1975	143.5	133.6	12.2	145.8	94.2	33.0	416.5	71.4
1976	134.9	152.4	3.6	156.0	91.2	33.7	415.8	69.7
1977	138.2	166.4	1.1	167.5	92.7	34.2	432.6	71.1
1978	126.4	186.0	0.5	186.5	93.4	34.0	440.3	71.9
1979	127.6	210.4	0.5	210.9	97.7	33.1	469.3	76.2
1980	109.8	214.7	0.4	215.1	93.1	26.3	444.3	72.4
1981	101.1	219.3	0.4	219.7	90.3	23.2	434.3	71.4
1982	105.0	211.7	0.3	212.1	87.1	21.9	426.1	72.2
1983	81.7	207.8	0.3	208.0	85.4	19.8	394.9	68.4
1984	41.0	253.2	0.3	253.5	89.4	19.0	402.8	71.0
1985	70.1	283.6	0.3	283.9	85.3	15.4	454.7	81.4
1986	84.9	216.7	0.2	216.9	87.3	15.7	404.8	73.6
1987	74.4	224.7	0.1	224.8	82.9	18.0	400.1	74.9
1988	65.8	191.9	0.0	191.9	79.5	21.2	358.4	69.4
1989	60.9	204.5	0.0	204.5	80.1	19.7	365.2	70.3
1990	47.0	188.8	0.0	188.8	74.2	14.1	324.1	67.3
1991	39.0	206.5	0.0	206.5	73.7	17.2	336.4	71.0
1992	38.8	200.0	0.0	200.0	73.7	16.1	328.6	70.5

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

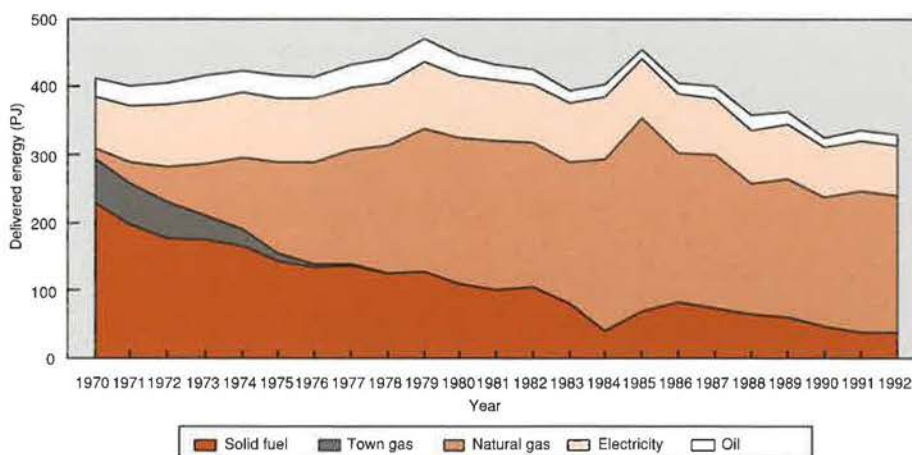


Figure 18 Energy use of the housing stock by fuel type

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 carbon dioxide emission trend shows a very marked reduction in emissions. There are a number of reasons for this reduction.

- The decline in the number of local authority homes has markedly reduced the overall energy use of this tenure.
- The energy efficiency improvements to local authority homes described in this report have also 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 ₂)					All fuels	
	Solid fuels	Natural gas	Town gas	Electric	Oil	Total (million tonnes CO ₂)	Per household (tonnes CO ₂)
1970	21.0	0.8	6.9	22.5	2.2	53.5	9.9
1971	18.5	1.9	5.0	23.3	2.3	51.0	9.3
1972	16.6	3.2	4.1	25.0	2.6	51.5	9.3
1973	16.2	4.4	2.8	26.2	2.9	52.5	9.4
1974	15.5	6.1	1.9	25.8	2.6	51.9	9.1
1975	13.5	7.7	0.9	25.5	2.6	50.2	8.6
1976	12.7	8.8	0.3	24.0	2.6	48.4	8.1
1977	12.9	9.6	0.1	24.4	2.7	49.7	8.2
1978	11.8	10.8	0.0	23.7	2.6	49.0	8.0
1979	11.9	12.2	0.0	25.7	2.6	52.4	8.5
1980	10.3	12.4	0.0	24.4	2.0	49.2	8.0
1981	9.4	12.7	0.0	23.4	1.8	47.4	7.8
1982	9.8	12.3	0.0	21.5	1.7	45.3	7.7
1983	7.6	12.0	0.0	20.6	1.5	41.8	7.2
1984	3.8	14.7	0.0	20.5	1.5	40.5	7.1
1985	6.5	16.4	0.0	19.7	1.2	43.8	7.8
1986	7.8	12.5	0.0	20.0	1.2	41.6	7.6
1987	6.9	13.0	0.0	18.8	1.4	40.1	7.5
1988	6.1	11.1	0.0	17.1	1.7	36.0	7.0
1989	5.7	11.8	0.0	16.8	1.5	35.8	6.9
1990	4.4	10.9	0.0	15.3	1.1	31.8	6.6
1991	3.6	12.0	0.0	14.7	1.3	31.6	6.7
1992	3.7	11.6	0.0	14.2	1.3	30.8	6.6

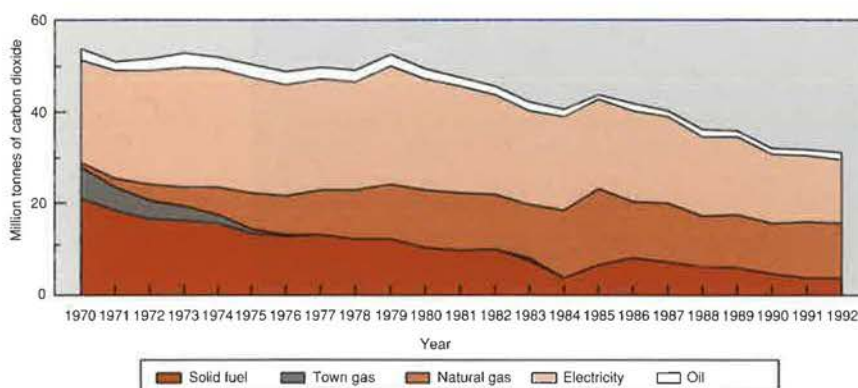


Figure 19 Carbon dioxide emissions due to domestic energy consumption

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 the 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 file¹.

- **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 **Shorrock L D, Henderson G and Bown J H F.** *Domestic energy fact file.* Building Research Establishment Report. Garston, BRE, 1992.
- 2 **Shorrock 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, Shorrock L D and Bown J H F.** *Domestic energy fact file: owner occupied homes.* Building Research Establishment Report. Garston, BRE, 1994.
- 4 **Dunster J E, Michel I, Shorrock 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.

