

Energy Use in Homes 2006

**A series of reports on domestic energy use in
England**

Space and Water Heating

Energy Use in Homes 2006

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This is one of a series of three reports on the energy characteristics of the stock as observed by the 2006 English House Condition Survey.

The reports in this series are:

1. Space and Water Heating
2. Thermal Insulation
3. Energy Efficiency

The English House Condition Survey is funded and provided courtesy of Communities and Local Government. More information about this survey can be found at www.communities.gov.uk/ehcs

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Energy Use in Homes 2006: Space and Water Heating

Executive Summary

The predominant form of space heating found in the English housing stock in 2006 is conventional central heating (boiler driven systems with radiators), present in 86 % of dwellings (18.9 million dwellings). The number of these systems has risen by 0.4 million since 2005 and by 5.0 million since 1991. Over the same period, the numbers of dwellings with room heaters and warm air systems have decreased significantly. The percentage of dwellings heated by storage radiators has increased since 1991, but decreased slightly between 2005 and 2006. The proportion of dwellings heated by communal heating systems has risen since 1991; this type of heating system is most common in purpose built flats.

Most conventional central heating systems are fuelled by gas, and therefore the proportion of dwellings using this fuel has increased from 78 % in 1991 to around 84 % in 2006. Oil fired heating systems have also increased, due to the installation of oil fired central heating in rural areas where access to mains gas is less common. The proportions of electric and solid fuelled heating systems have decreased since 1991.

Several different types of boiler exist which run conventional central heating and water heating systems. The standard boiler is the most common type of boiler found in English dwellings (found in 41 %), however the numbers of this boiler type have declined since 1991. The back boiler and dwellings with no boiler at all have seen a decrease during this period. The combination boiler has seen a significant increase during this period (from 1.2 % in 1991 to 28.7 % in 2006). Since 2005 the percentage of dwellings with a non-condensing combination boiler has remained static, whilst the proportion of condensing boilers has risen dramatically. This is due to the introduction of new building regulations in 2005, stating that all new and replacement boilers should be condensing. The condensing combination boiler has proved more popular than the standard condensing boiler. Combination boilers (both non-condensing and condensing) have grown in popularity in recent years, partly because they do not require a water tank and hot water cylinder (as standard boilers do), making them easier to install and requiring less space which makes them suitable for smaller dwellings.

Most dwellings have some form of secondary heating to act as a back up to the main heating system and the most common secondary systems are room heaters, found in 72 % of English dwellings. The proportion of dwellings using these for secondary heating has increased since 1991, as the proportion of dwellings with no secondary heating has decreased. This either suggests the installation of room heaters in rooms not covered by central or storage heating, or an existing set of room heaters becoming secondary when central heating has been installed. The most common types of room heaters used for secondary space heating are mains gas open or balanced flue heaters; electric panel, convector or radiant heaters; solid fuel open fires; and mains gas live effect and decorative fires.

In 86 % of dwellings the main system for provision of hot water is the same system that runs the central heating. Since 1991 the percentage of dwellings with this type of water heating has risen (from 73 %), whilst the percentage of dwellings with electric immersion heaters as the main system for provision of hot water has decreased. 51 % of dwellings still have an electric immersion heater, however in many cases it is used as a back up system to the hot water provided by the central heating system.

2006 Space and Water Heating Update Report

Summary

- Increases in the proportions of conventional central heating, gas fired heating systems, and water heated using the same system as the central heating have been seen between 2005 and 2006.
- Although still relatively uncommon the proportion of condensing boilers has risen dramatically since 2004 after new building regulations were introduced in 2005, requiring the use of condensing boilers for new and replacement systems.
- Single person households and those with the lowest incomes tend to live in dwellings with the lowest proportions of conventional central heating; gas fired heating systems and water heated by the central heating system.

Introduction

This report looks at the space and water heating systems found in the English housing stock in 2006, using data from the 2006 English House Condition Survey. These heating systems and the fuels used to run them are compared to dwelling and household characteristics such as dwelling type, tenure and household income. They are also tracked over time using data from previous English House Condition Surveys. Since 2002 the EHCS has run in a continuous format, providing annual data which is then analysed in two year datasets. This report analyses data from the 2005-2006¹ dataset and compares this to data from the previous continuous surveys and to surveys carried out in 1991, 1996 and 2001.

A closer look is taken at communal space heating systems, primary space heating fuels used in the South West of England, condensing boilers, secondary heating types and fuels used for heating water.

Primary Heating Systems

This section of the report concentrates on the primary space heating systems present within English dwellings. The most predominant of these systems are boiler systems with radiators (as can be seen from Table 1). In these systems, water is heated by a boiler and distributed to radiators throughout the dwelling.

Figure 1 shows the change in the percentage of English housing stock with boiler systems with radiators against all other heating systems over time. Since 1991 the proportion of these conventional central heating systems

has risen from 71 % (13.9 million) to 86 % in 2006 (18.9 million). Since 2005 the number of dwellings with these systems has risen by 0.4 million. Around 0.2 million new dwellings were built in England between 2005 and 2006; most of which would have been fitted with conventional central heating. The use of non-boiler space heating systems has declined during this period.

Primary heating system	Percentage of total stock (%)
Boiler system with radiators	85.8
Storage radiators	7.0
Warm air system	1.3
Room heater	3.9
Other systems	0.1
Communal	1.7
Portable heaters only	0.2
Total	100.0

Table 1: Distribution of Primary Heating Systems.

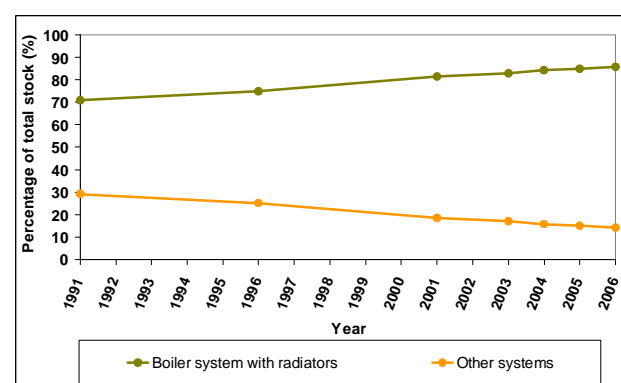


Figure 1: Timeline of boiler systems with radiators against other systems.

The second most predominant type of heating system after conventional central heating systems are storage radiators. Storage radiators use off-peak electricity to store heat (in high density bricks), which is released throughout the day.

Figure 2 shows the changes in the percentages of primary heating systems other than those with boilers and radiators in the English housing stock. In 1991 storage radiators were the third most common type of primary heating system. The percentage of these systems increased from 6 % in 1991 to 8 % in 1996, then levelled out between 2001 and 2005, but has decreased slightly to 7 % in 2006.

The use of fixed room heaters such as mains gas fires, electric panel heaters and solid fuel open fires, as the primary heating source, has decreased from 18 % in

¹ The 2005-2006 combined dataset contains data collected between April 2005 and March 2007.

1991, when they were the second most common form of primary heating system, to 4 % of the stock in 2006. The use of less common heating systems such as warm air systems and portable heaters has also decreased over this period.

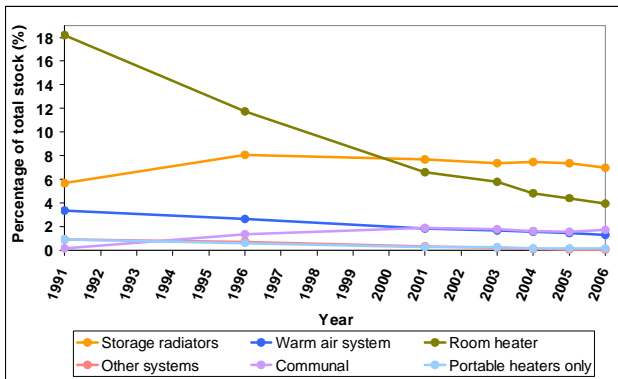


Figure 2: Timeline of other primary heating systems.

Communal heating systems are those that serve more than one dwelling. These systems, although still rare, became more common between 1991 and 2001 (rising from 0.2 to 2 % of the stock) and proportions have remained fairly constant since. Communal systems are looked at in greater detail in the fact box opposite. The proportion of other systems such as electric under floor or ceiling heating has declined since 1991.

Figure 3 shows a comparison of the primary heating system types with the household satisfaction rating for the heating system. The satisfaction ratings range from very effective to not at all effective. Around 93 % of households that have conventional central heating, rate the heating system as being either very or fairly effective. The perceived effectiveness of this type of system has probably been a factor in the increasing proportions of this type of heating system, as new or replacement heating systems are installed. Households who have room heaters or portable heaters as their primary heating source are least likely to perceive their heating system as very effective.

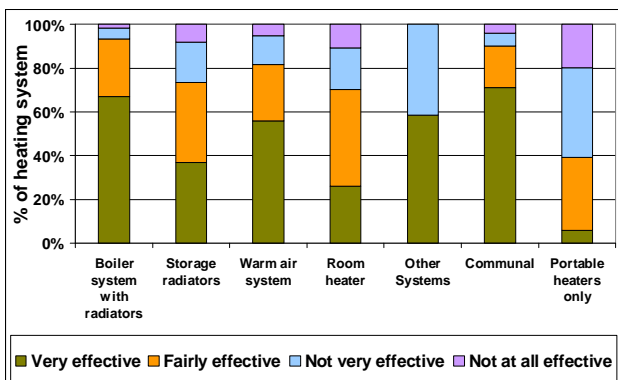


Figure 3: Comparison of space heating systems by household satisfaction rating for heating.

Fact Box: Communal Space Heating Systems.

Communal space heating systems, which are most commonly found in purpose built flats, provide heat from a central source to heat more than one dwelling. Heat is usually either supplied via a boiler or through a Combined Heat and Power plant (CHP). They use energy more efficiently due to the multiple users of a single source of power. The most predominant type of communal heating is via a boiler driven system (93 % of dwellings with communal heating). 7 % of dwellings with communal heating are heated using a waste heat/CHP system.

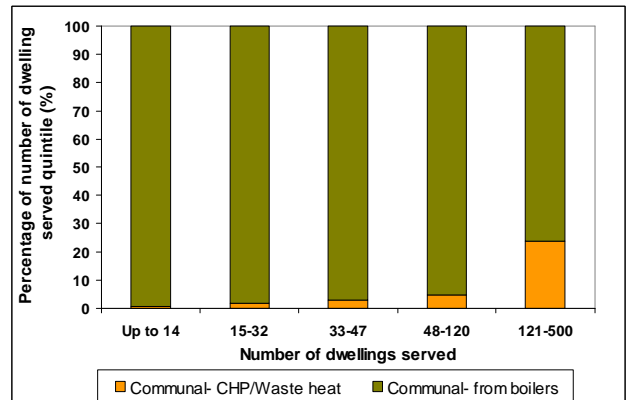


Figure 4: Comparison of type of communal heating by the number of dwellings served by the heating system.

Figure 4 shows a comparison of the different types of communal heating by the number of dwellings serviced by the system. The proportion of dwellings heated by combined heat and power (CHP) or waste heat, increases as the number of dwellings rises.

93 % of converted flats that are communally heated have systems that provide heat for up to 14 dwellings and all of these are served by systems using a boiler to provide heat. For many of these cases it is possible that the boiler and heating system from the original dwelling, which has been converted into flats, is still in use.

For houses that are communally heated, CHP/ waste heat is more common than for flats (28 % of houses with communal heating, compared to 6 % of flats). Communally heated houses are more common where larger numbers of dwellings are served by communal systems (24 % of dwellings with communal heating for 121-500 dwellings are houses). These houses are likely to be on purpose built estates, which were fitted with communal heating systems when built.

In large scale communal heating systems heat is distributed via a network of flow and return pipes to individual dwellings. Each dwelling is fitted with a hydraulic interface unit instead of a boiler, which includes a heat exchanger for provision of space heating to radiators and separate domestic hot water.

Dwelling Type

It can be seen from Figure 5 that houses have a much larger proportion of conventional central heating systems than flats. Flats are more likely than houses to be heated by storage heaters, room heaters or communal heating. 84 % of communal heating systems are found in purpose built flats (both low- and high-rise)².

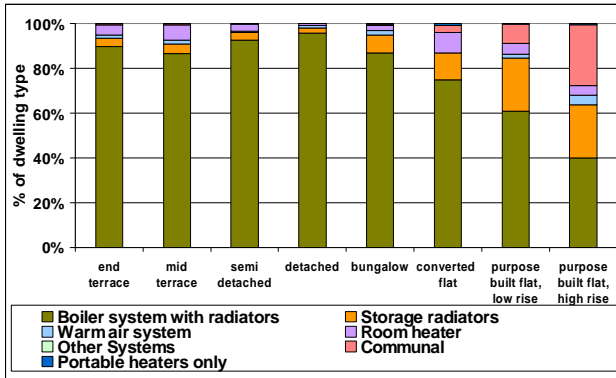


Figure 5: Comparison of space heating systems by dwelling type.

In figure 6 primary heating systems are compared with the construction date of the dwelling. Conventional central heating is the most common form of primary heating in dwellings of all ages. Storage heaters are more common in dwellings built post 1980 (16 % of dwellings built between 1980 and 1990, and 10 % of dwellings built post 1990); this can be credited to the larger proportion of flats built during this time period.

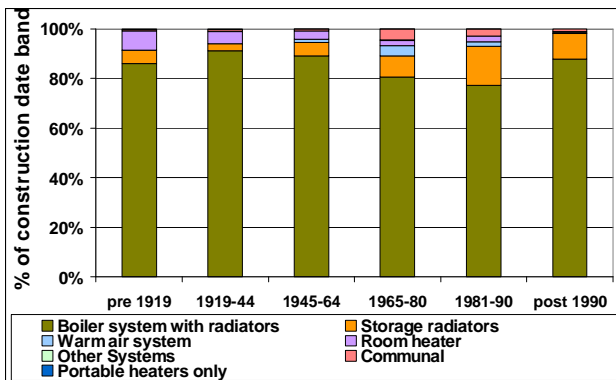


Figure 6: Comparison of space heating systems by dwelling construction date.

The use of room heaters as the primary heating source for a dwelling is less common in dwellings built post 1965. Warm air systems are most common in dwellings built between 1965 and 1980 (68 % of warm air systems are found in dwellings of this age); this is because these systems were typically installed in the 1960's and 1970's, as were other systems such as electric underfloor or ceiling heating.

² High rise flats are those with more than 5 storeys.

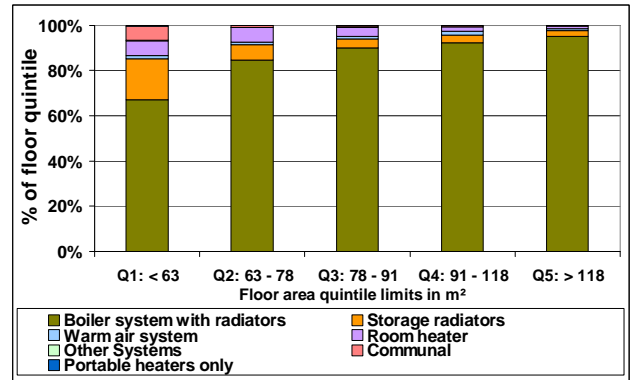


Figure 7: Comparison of space heating systems by floor area quintiles.

There is strong correlation between the total floor area of dwellings and the type of primary space heating system installed in the dwelling (see figure 7). Conventional central heating is the predominant type of space heating for all floor area quintiles (floor areas are split into five equal groups). However 18 % of dwellings with a floor area of less than 63 m² are heated by storage radiators, compared to 2.5 % of dwellings with a floor area greater than 118 m². Dwellings with a floor area of less than 63 m² have the largest proportion of communal heating (73 % of all communal heating systems) and room heaters (33 % of dwellings with room heaters only). These dwellings are, unsurprisingly, more commonly flats (55 % of this quintile), in which proportions of these minority heating systems are higher (see figure 5).

Dwelling Location

Region	% Boiler system with radiators	% Storage radiators	% Room heater
East Midlands	89.2	5.3	3.1
North East	89.3	4.4	2.6
South East	85.4	7.9	3.0
Yorks & Humber	87.3	3.9	6.8
East England	84.2	10.4	2.1
London	84.9	6.5	3.2
North West	87.7	4.9	5.2
West Midlands	83.7	7.6	5.2
South West	83.1	10.3	4.1
Total	85.8	7.0	3.9

Table 2: Comparison of the key space heating systems by region.

The highest incidence of conventional central heating (boiler systems with radiators) is found in the North East and the East Midlands government office regions. Around 89 % of primary heating systems in these areas are boiler systems with radiators (see Table 2). The South West

has the lowest incidence of conventional central heating (83 % of primary heating systems in this government office region). The percentage of conventional central heating systems in the South West has risen from 80.5 % in 2005.

The percentage of dwellings heated by storage heaters in the South West has fallen from 13 % in 2005 to 10 % in 2006, whilst 49 % of all communal space heating systems are found in London and the South East, due to the high proportion of flats in these areas.

Tenure

Figure 8 shows a comparison of primary space heating systems with tenure. Private rented accommodation has the lowest proportion of conventional central heating, with 74 % compared to 90 % in owner occupied dwellings. It also has the highest proportion of dwellings heated by room heaters only (8 % of private rented dwellings compared to 1.5 % in RSL (Registered Social Landlord) dwellings). 48 % of converted flats are found in the private rented sector which explains the high incidence of room heaters in this sector, as they are more common in this type of dwelling (see figure 5).

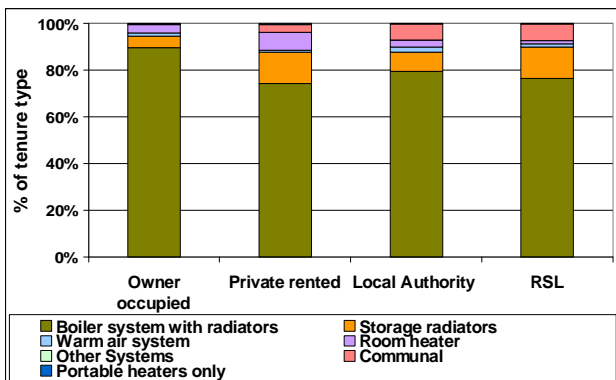


Figure 8: Comparison of space heating system by tenure.

Owner occupied dwellings have the highest proportion of conventional central heating. This sector also has the highest proportion of detached and semi-detached houses (54 % of owner occupied dwellings), which have a high proportion of boiler systems (see figure 5). In owner occupied housing, the household may have more control over the heating type, and therefore systems which are perceived as more effective such as boiler systems with radiators, are more common.

Local Authority and RSL housing have a comparatively high proportion of communal heating (around 7 % of the social sector compared to less than 1 % of owner occupied stock). This is due to the high proportion of purpose built flats in these tenures (41 % and 36 % respectively), which have the highest proportions of communal heating (see figure 5).

93 % of owner occupiers perceive their primary space heating system to be either very or fairly effective; this correlates well with the high percentage of boiler systems with radiators found in this sector. Conversely only 78 % of those in private rented accommodation consider their primary heating system to be either very or fairly effective. Less than half (47 %) of householders in the private rented sector would perceive their primary heating as very effective. This correlates well with the high percentage of less energy efficient room heaters and storage radiators in this sector. Local Authority and RSL housing fairs better than private rented accommodation, with 85 and 86 % of householders respectively considering their heating to be either very or fairly effective. This may be due to the higher percentage of communal and boiler systems with radiators than in private rented dwellings.

Household Type

Figure 9 shows a comparison of the primary space heating types within household groups. Single person households (one person under 60 and one person 60 or over) have the highest incidence of storage radiators, room heaters and communal heating, and the lowest incidence of conventional central heating. Single people under the age of 60 more commonly live in flats than other household groups (40 % of single person households under 60, compared to 6 % of couples with children). Single person households with those aged over 60 commonly live in either flats (27.5 % of household group) or bungalows (21 % of household group). Flats and bungalows have higher percentages of storage radiators than other types of dwelling and flats are more likely to have communal heating or room heaters (see figure 5).

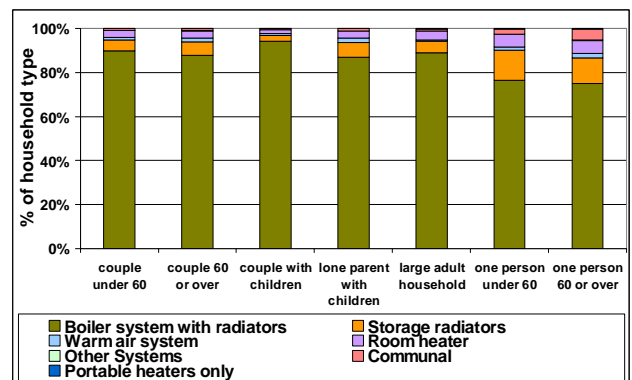


Figure 9: Comparison of space heating system by household group.

The net income of a household also affects the type of primary space heating system (see figure 10). The lower the income for the household, the higher the proportion of storage heaters (11 % of households with incomes below £10,000), room heaters (6 % of the lowest income quintile) and communal heating systems (4 % of the lowest income quintile). A significant proportion of households with incomes below £10,000 live in flats which have a higher proportion of these heating types.

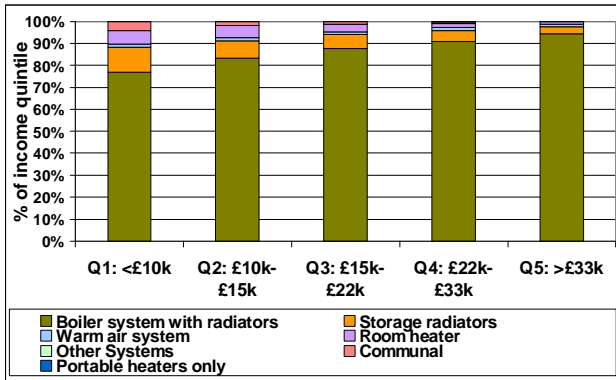


Figure 10: Comparison of space heating system by household income.

The highest proportion of conventional central heating is seen in households in the highest income bracket (94 % of households with incomes above £33,000). This is because almost two-thirds of households in the highest income bracket live in detached or semi-detached dwellings, which have the highest proportions of conventional central heating.

Space Heating Fuels

This section of the report considers the fuels used to run the primary space heating systems. The most common fuel used for space heating is gas (including mains gas, LPG and bottled gas), 84 % of the English housing stock have gas fired heating systems (see Table 3). Most conventional central heating systems run on mains gas, whilst warm air systems and fixed room heaters are also likely to be fuelled by gas.

Primary heating fuel	Percentage of total stock (%)
Gas fired system	84.4
Oil fired system	4.2
Solid fuel fired system	1.5
Electrical system	8.2
Communal system	1.7
Total	100.0

Table 3: Distribution of Space Heating Fuels.

The predominance of gas fired heating systems has grown since 1991 (see figure 11) from 78 % of the total stock (15.3 million dwellings), to the current level (18.6 million dwellings). The overall proportion of other fuels has decreased.

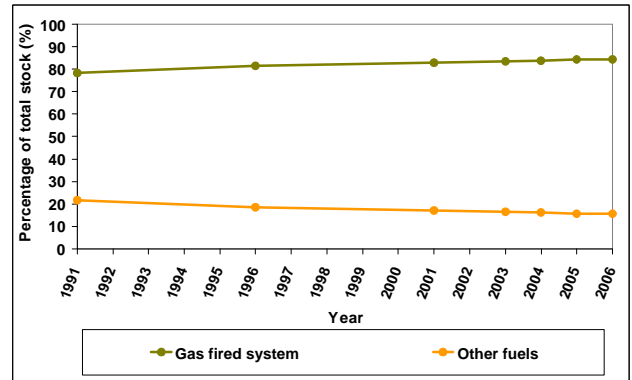


Figure 11: Timeline of gas fired heating systems against other fuel types.

Figure 12 shows a timeline from 1991 to 2006 for all non-gas heating fuels. The decrease in the proportions of electric and solid fuel fired systems is due to the decline in the use of room heaters and portable heaters since 1991.

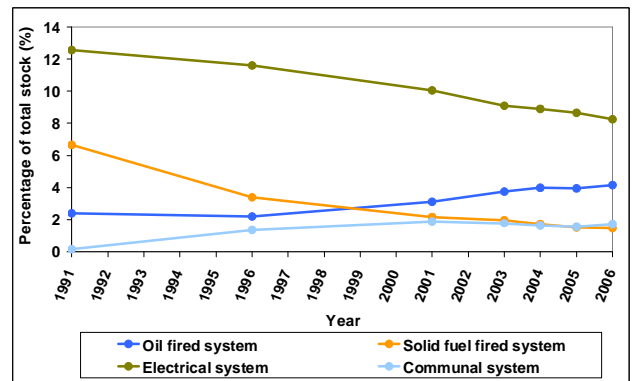


Figure 12: Timeline of other heating fuels.

There has been an increase in oil fired heating systems since 1991 from 2 % of the housing stock. This increase is mainly due to a rise in oil fired conventional central heating in areas that do not have access to mains gas.

Dwelling Type

Figure 13 shows a comparison of space heating fuels with dwelling type. As would be expected from the pattern shown in figure 5, flats have a larger proportion of electric heating systems than houses, as storage radiators and room heaters are more common sources of primary space heating in flats.

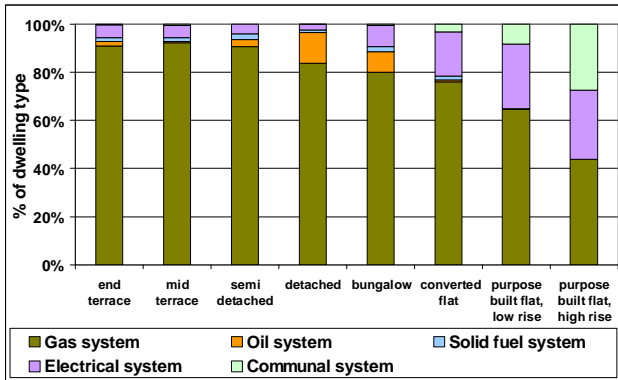


Figure 13: Comparison of space heating fuels by dwelling type.

Gas is the most common heating fuel for all house types, because of the prevalence of conventional central heating in houses. Detached houses have the largest proportion of oil fired heating systems (13 % of the dwelling type), followed by bungalows (8.5 % of the dwelling type). These dwelling types are common in rural areas, where connection to the mains gas supply is less common than in other areas.

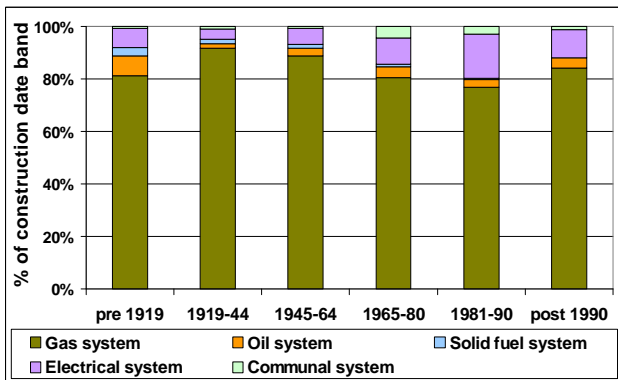


Figure 14: Comparison of space heating fuels by dwelling construction date.

The proportions of heating fuels by dwelling construction date are shown in figure 14. Pre 1919 dwellings have the highest proportion of solid fuel fired heating systems (3 % of the dwelling age category and 44 % of all solid fuel fired systems). 60 % of these solid fuel fired systems in pre 1919 dwellings are boiler systems with radiators, the rest are solid fuel fired room heaters. Pre 1919 dwellings also show the largest proportion of oil fired heating systems (8 % of the dwelling age). A relatively large proportion of dwellings in rural locations were built pre 1919 (28 % of dwellings in rural locations compared to 11 % in suburban residential locations). This may account for the higher proportion of oil fired systems found in dwellings of this age.

Post 1980 dwellings and homes with small floor areas (see Figure 15) have high proportions of electric heating systems. This is because of the high percentage of storage heaters found in these dwellings which are more

likely to be flats, whilst the majority of communal systems feature in this quintile for a similar reason.

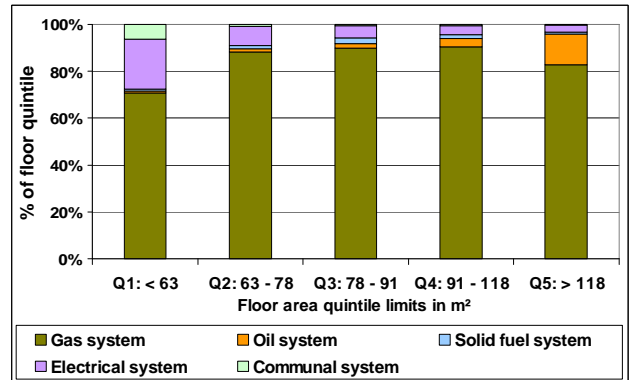


Figure 15: Comparison of space heating fuels by floor area quintile.

Dwellings with floor areas over 118 m² have the highest proportion of oil fired heating systems, this is because a large proportion of dwellings within this floor area quintile are in rural locations (38 % of dwellings within rural locations have floor areas greater than 118 m²) which may not have access to mains gas.

Dwelling Location

The fuels used within each region can depend on the nature of the area that the region covers, for example, whether the region has more rural or urban locations. The four regions with the highest percentage of rural areas, East Midlands, South East, East of England and South West, also have the lowest proportion of gas fired heating systems this can be seen in Table 4. This is because rural locations have a lower level of access to mains gas than urban and suburban areas. The heating fuels used in the South West of England are discussed in greater detail in the following fact box.

London has the lowest percentage of dwellings in a rural location and accordingly a very small minority of oil fuelled systems. However, gas does not dominate to the same extent as northern regions because of the relatively high proportions of electric and communal heating found in London due to the large number of flats.

Region	% Gas system	% Oil system	% Electrical system
North West	90.1	2.1	5.8
Yorks & Humber	88.4	2.7	4.9
North East	88.6	1.8	4.7
London	87.3	0.0	7.9
East Midlands	84.7	4.8	6.0
South East	83.6	4.7	9.6
West Midlands	85.5	3.1	9.0
East England	76.1	9.4	11.7
South West	75.3	9.5	12.2
Total	84.4	4.2	8.2

Table 4: Comparison of key space heating fuels by region

Tenure

A comparison of space heating fuels by tenure is shown in figure 16. The private rented sector has the highest proportion of electric heating (17 % of private rented dwellings) due to the relatively high proportion of storage heaters and room heaters found in these dwellings. This tenure also includes the highest proportion of solid fuel fired heating systems (3 % of the tenure). 43 % of these are used for room heaters, whilst the rest are solid fuel fired boiler systems with radiators. Private rented accommodation also has a high proportion of dwellings built pre 1919 (43 % of private rented dwellings), which have the highest incidence of solid fuel fired heating systems as seen in figure 14.

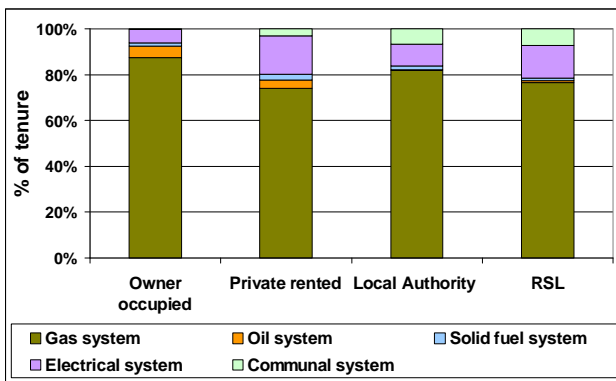


Figure 16: Comparison of space heating fuels by tenure.

Fact box: Heating Fuels in the South West.

The South West of England has the lowest proportion of gas fired space heating in England. In this region the percentage has risen from 67 % in 1991 to 75 % in 2006. This is probably due to the spread of mains gas installations.

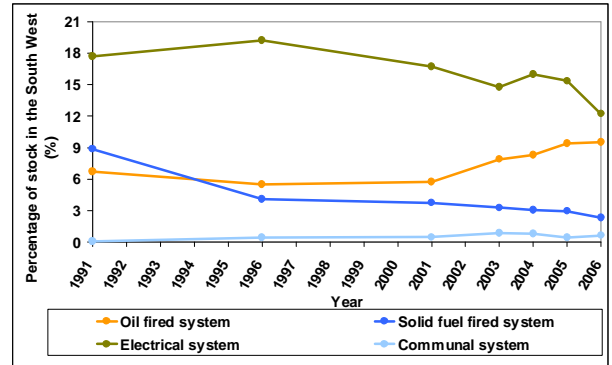


Figure 17: Timeline of non-Gas fired space heating systems in the South West.

Figure 17 shows a timeline of the percentages of other fuels used for space heating between 1991 and 2006. Electric heating systems are the second most common heating systems in the South West and the region has the highest percentage of these systems compared to other regions. The proportion of electric systems has fluctuated since 1991, but has generally decreased from 18 % to 12 % in 2006. The percentage of solid fuel fired systems has also decreased during this period.

The proportion of oil-fired heating systems has risen from 7 % in 1991 to 9.5 % in 2006. This rise is due to the installation of oil fired boiler systems in areas not connected to mains gas. The overall percentage of boiler systems with radiators in the South West has risen from 67 % in 1991 to 83 % in 2006.

Household Type

Figure 18 shows the distribution of space heating fuels over different household groups. Gas fired space heating systems are least common in single person households who more commonly live in dwellings that have electric heating, such as storage radiators. Around 14% of households containing only one person live in dwellings heated by an electrical system.

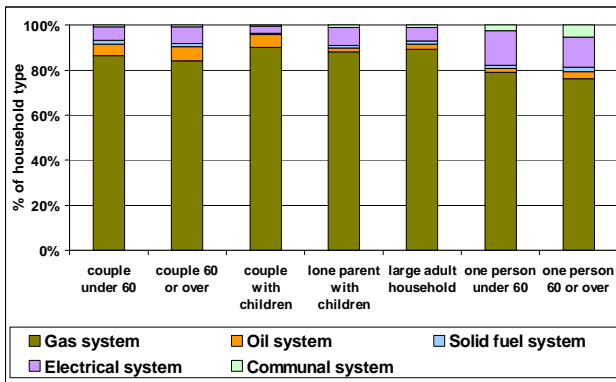


Figure 18: Comparison of space heating fuels by household group.

Oil fired space heating systems are most commonly found in dwellings occupied by couples over the age of 60 (6 % of the household group). This is because a relatively large proportion (25.5 %) of couples over 60 live in rural locations compared with 19 % of all households.

The distribution of space heating fuels by income is shown in figure 19. Electric heating is most common in dwellings occupied by households in the lowest income group (13 % of households with incomes under £10,000 per annum). This is because of the high proportion of storage heaters and room heaters in dwellings occupied by this income group. 15 % of households with incomes below £10, 000 per annum live in private rented accommodation (compared to 6 % of households with incomes over £33, 000 per annum).

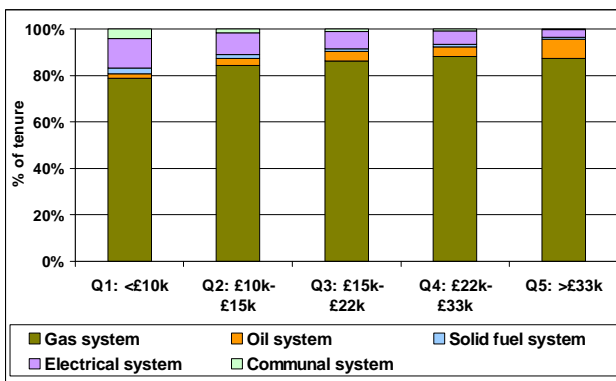


Figure 19: Comparison of space heating fuels by income.

Oil fired heating systems are most common in dwellings occupied by households within the highest income group (8 % of the income group) who more commonly live in rural locations (30 % compared to 13 % of those in the lowest income group).

Boiler Categories

This section looks at the type of boilers used in dwellings that use conventional central heating systems and figure 20 shows the proportions of these different types. The standard boiler is most common (41 % of the housing

stock), followed by combination boilers (29 % of the housing stock). Combination boilers supply heat for both space heating and water. They heat water on demand, as opposed to standard boilers which heat water which is stored in a cylinder until use. 13 % of the stock do not have boiler, and only 8 % of the stock have condensing boilers.

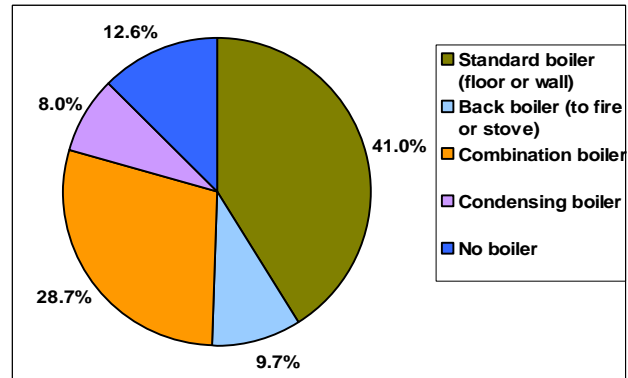


Figure 20: Proportions of boiler types.

The proportions of boiler types has changed over time as building regulations have changed and more efficient boiler types have been installed. Figure 21 shows the percentages of different boiler types between 1991 and 2006.

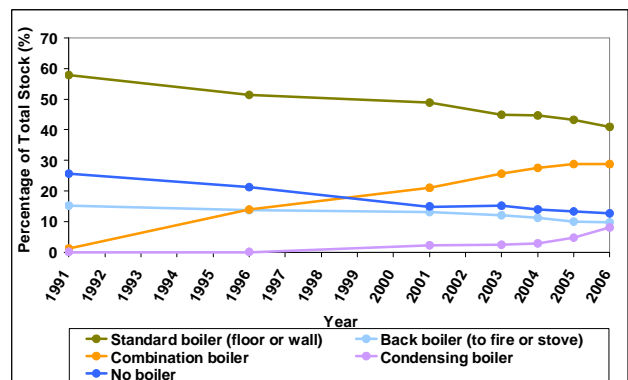


Figure 21: Timeline of boiler types.

The share of dwellings without boilers has fallen from 26 % of the stock in 1991 to 13 % in 2006, as the number of dwellings with central heating has risen. Both the number of standard boilers and back boilers has fallen, the number of combination boilers has dramatically risen from a small minority in 1991 to 29 % in 2006, although since 2005 the proportion of combination boilers has remained constant. New building regulations introduced in April 2005, specify that condensing boilers must be used when installing new or replacement boilers, or upgrading from a non-central heating system (see the following fact box for more detail on condensing boilers).

Fact box: Condensing Boilers.

Condensing boilers are more efficient than other boiler types. They work by utilising heat from waste gases which would otherwise be lost. This is done by using a larger heat exchanger or a secondary heat exchanger, to extract heat from the waste gas. Condensing boilers can convert more than 90 % of their fuel into heat compared to 78 % for more conventional boiler types. The temperature of the gases exiting the flue of a condensing boiler is typically 50-60 °C compared to 120-180 °C for a non-condensing boiler.

The percentage of condensing boilers in the housing stock grew gradually from 1996 to 2004. However, since 2004 the percentage has increased more rapidly, from 3 to 8 %. The total number of dwellings with condensing boilers is now around 1.8 million. This is due to the introduction of new building regulations since 2005, which state that all new and replacement boilers should be condensing.

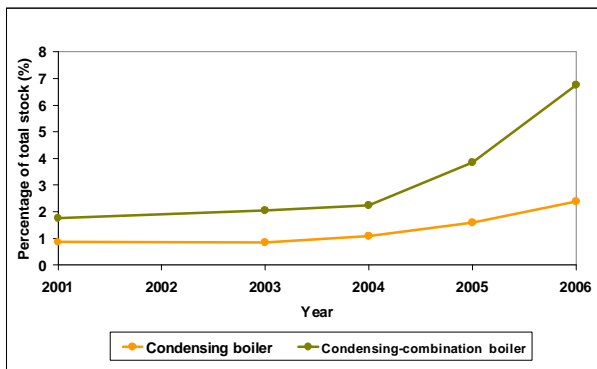


Figure 22: Timeline of condensing boiler types.

Figure 22 shows a timeline of the different condensing boiler types. Condensing combination boilers make up a larger proportion of the stock (7 %) and have increased more rapidly than standard condensing boilers. The advantage of combination boilers is that there is no need for water tanks and hot water cylinders, which makes installation easier and uses less space.

Figure 23 shows a comparison of the different boiler types with the household's satisfaction rating for the heating system. 76 % of households that live in dwellings with condensing boilers judge the heating system to be "very effective". Apart from heating systems which are not boiler driven (i.e. dwellings with no boiler), back boilers appear to be the least effective boiler type. Around 10 % of households with back boilers rate their heating system as not very effective or not at all effective. The percentage of back boilers in the housing stock has steadily decreased since 1991 to be replaced with boilers that are perceived to be more effective.

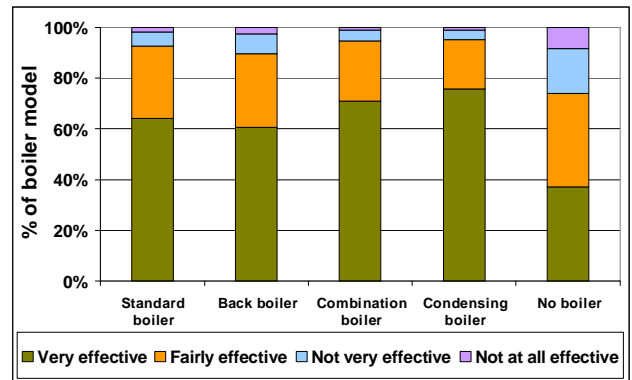


Figure 23: Comparison of boiler type by household satisfaction rating for heating.

Dwelling Type

A comparison of boiler types with dwelling type is shown in figure 24. Flats have the highest proportion of dwellings without boilers; this is due to the relatively low proportion of conventional central heating systems in these dwellings. Detached dwellings have the highest proportion of standard boilers (68 % of the dwelling type). Combination boilers are most common in converted flats (45 % of the dwelling type). Combination boilers are most suitable for small dwellings, because they require less room than for a standard or back boiler due to the absence of a water tank and hot water cylinder.

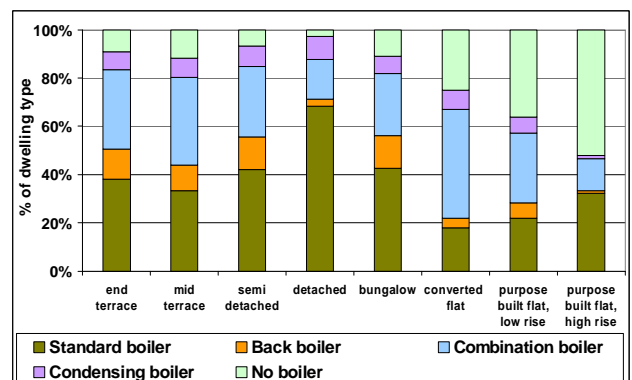


Figure 24: Comparison of boiler types by dwelling type.

As can be seen from figure 21 the percentage of combination boilers has grown significantly since 1991. The condensing combination boiler has also proved more popular than the standard condensing boiler (see figure 22). Figure 25 shows a timeline of the percentage of all combination boilers (including condensing combination boilers) by general dwelling types. The percentage of combination boilers has increased for all dwelling types since 1991. They are most prevalent in converted flats. Most houses that are converted into flats probably have a gas supply and therefore when conversion to flats takes place, it is sensible to install gas central heating. The combination boiler is often the boiler of choice, because it is suited to this small dwelling type due to the lack of need for water tanks and cylinders.

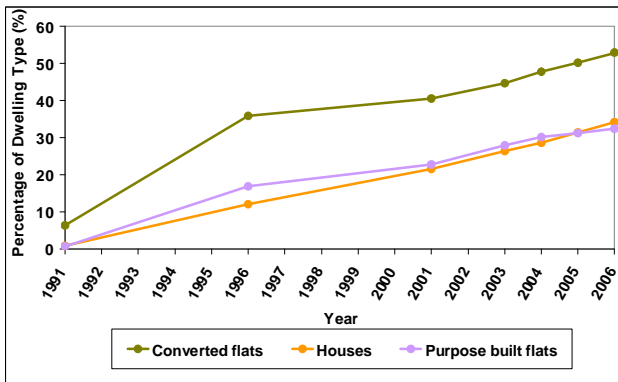


Figure 25: Timeline of all combination boilers, including condensing combination boilers, by dwelling type.

A comparison of boiler types with the dwelling construction date is shown in figure 26. Dwellings built since 1990 have the highest proportion of condensing boilers (10 % of dwellings built since 1990). This is due to all new dwellings being fitted with condensing boilers since 2005 through building regulations.

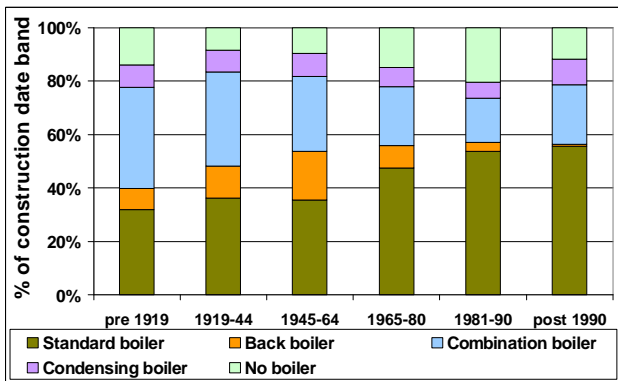


Figure 26: Comparison of boiler types by dwelling construction date.

Combination boilers are most common in early stock (38 % of pre 1919 stock, compared to 22 % of post 1990 stock), due to replacement of old boilers or installation of central heating systems in recent years, as the combination boiler has become more common. Back boilers are least common in more modern dwellings (2 % of post 1980 stock) but more predominant in dwellings built between 1945 and 1964 (18 % of 1945-64 stock). In stock built before 1945 back boilers are less common than between 1945 and 1964 because any original back boilers are likely to have been replaced with other boiler types as they have come to the end of their lifespan.

Standard boilers are most common in the largest dwellings (62 % of dwellings in the top fifth of floor areas) and least common (25%) in the smallest fifth of the stock as seen in figure 27. However the inverse is found for dwellings using combination boilers, for the above reasons relating to saving space.

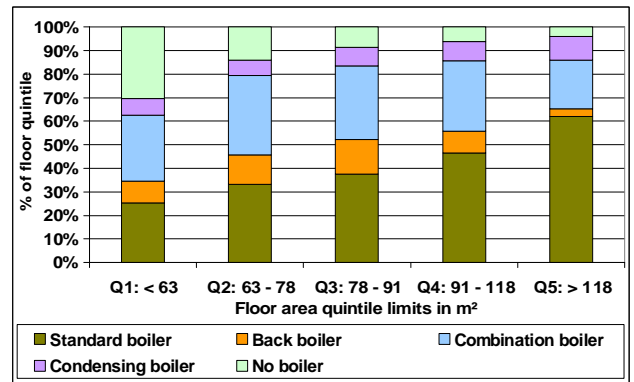


Figure 27: Comparison of boiler types by floor area quintiles.

Dwelling Location

Rural areas have the highest percentage of standard boilers (51 %, compared to 30 % in city and other urban areas, see figure 28). City and other urban areas have the highest percentage of combination boilers (37 % compared to 20 % in rural areas). Combination boilers are more common in cities and urban areas due to generally smaller dwelling sizes in these types of area, which are better suited to combination boilers. Standard boilers are more common in rural areas due to larger dwelling sizes.

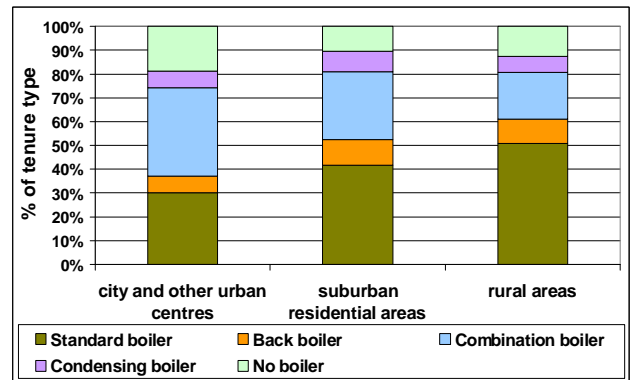


Figure 28: Comparison of boiler types by type of area.

London has a higher percentage of dwellings without boilers (14 %) than other government office regions, due to the higher proportions of flats using electrical heaters in this area. London, however, also has a higher than average proportion of combination boilers, due to the urban character of the area and the smaller floor areas.

Tenure

Owner occupied stock has the highest proportion of standard boilers (46 % of owner occupied stock), as can be seen in figure 29. This is partly due to the high proportion of detached houses in this tenure group. Private rented accommodation has the highest percentage of combination boilers (33 % of private rented stock), due to the large proportion of converted flats in this sector.

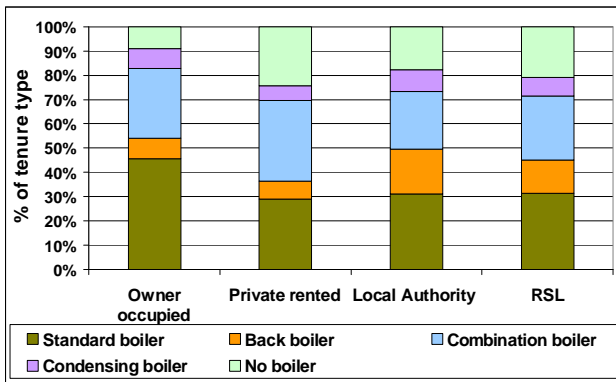


Figure 29: Comparison of boiler types by tenure.

Household Type

The distribution of boiler types with household groups is given in figure 30. Couples, over and under the age of 60 and couples with children are more likely to live in dwellings with standard boilers (45 %, 48 % and 46 % respectively). These household types are more likely to live in detached houses than other household groups, which correlates with the higher incidence of standard boilers.

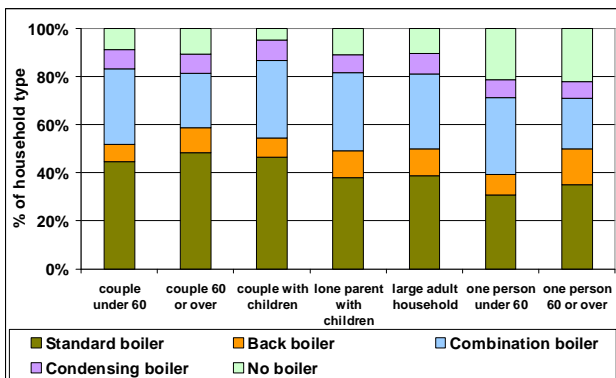


Figure 30: Comparison of boiler type by household group.

Single person households (over or under the age of 60) commonly live in dwellings where standard boilers are less predominant (only 35 % of single person households aged 60 or over and 31 % of single person households aged under 60 live in dwellings with standard boilers). Households with one person aged over 60 are more likely to live in dwellings with back boilers (15 % of the household group). This household group are also more likely to live in bungalows which have a fairly high proportion of back boilers (13 % of bungalows compared to 3 % of detached houses have back boilers).

In dwellings where the age of the household representative person (HRP) is between 16 and 29 combination boilers are more common than for other age groups (37 % of households within this age group compared to 21 % of households aged over 65). These households more commonly live in flats (in particular

converted flats) and older dwellings which have relatively large proportions of combination boilers.

From the comparison of boiler types with household income shown in figure 31, it can be seen that the highest proportion of back boilers are found in dwellings occupied by those in the lowest income category (14 % of the income quintile and 29 % of all back boilers). A large proportion of those in the lowest income quintile (44 %) live in local authority or RSL dwellings which have a relatively high proportion of back boilers compared to the rest of the stock (see figure 29).

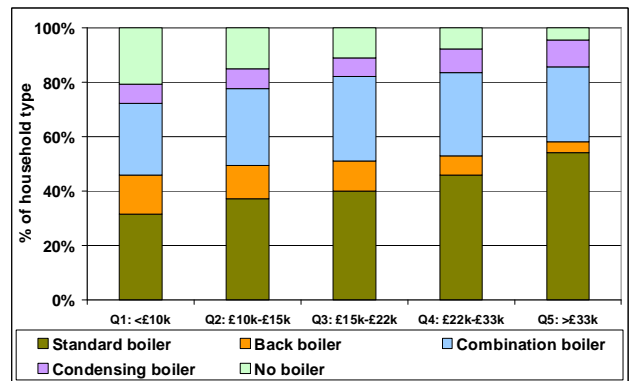


Figure 31: Comparison of boiler type by household income.

Secondary Heating Systems

This section of the report considers types of secondary heating in the English housing stock. These are mainly used as a back-up to the primary heating system. The EHCS collects information on the predominant form of secondary heating in a dwelling, although there could be others omitted from this analysis. The data is drawn from the SAP methodology, which assumes that no secondary system is present in communally heated dwellings. It also gives homes with storage heaters as their primary system. These assumptions are included in the analysis.

Table 5 shows the distribution of secondary heating systems in 2006. The most common collective group of secondary systems are room heaters (present in 15.8 million dwellings, 72 % of the stock), however around a quarter of the stock does not have a secondary heating system. Other less common types of secondary heating are storage heaters (which could be individual or only present in a few rooms) and portable heaters.

Secondary heating system	Percentage of total stock (%)
No secondary heating	26.1
Storage radiators	0.4
Room heater	71.7
Portable heaters only	1.8
Total	100.0

Table 5: Distribution of Secondary Space Heating Systems.

The changes in the proportions of the types of secondary space heating systems since 1991 are shown in figure 32. The percentage of stock without any secondary heating has fallen from 33 % in 1991 to 26 % in 2006, although since 2003 has stayed fairly constant at around 25-26 %. The percentage of dwellings with room heaters such as fixed gas or electric fires has risen from 64 % in 1991 and has remained fairly constant at around 72 % since 2003. This either suggests that where secondary heating systems have been installed in dwellings, these are mainly room heaters or that existing room heaters have become the secondary heating when central heating systems have been installed.

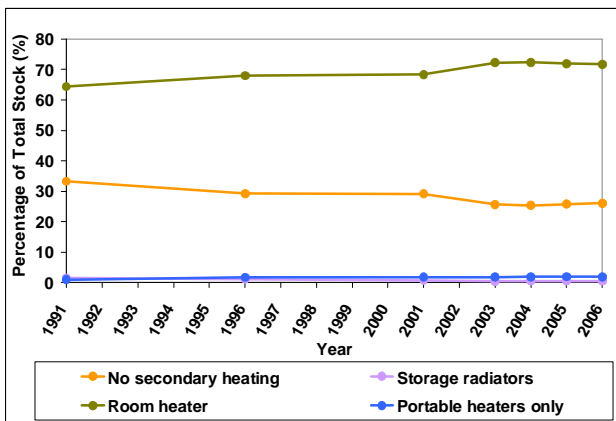


Figure 32: Timeline of secondary space heating systems.

Dwelling Type

The types of primary space heating systems vary greatly with the type of dwelling (see figure 5) therefore it might be expected that the types of secondary space heating systems are also dependent on the type of dwelling. Figure 33 shows a comparison of secondary heating systems with dwelling type.

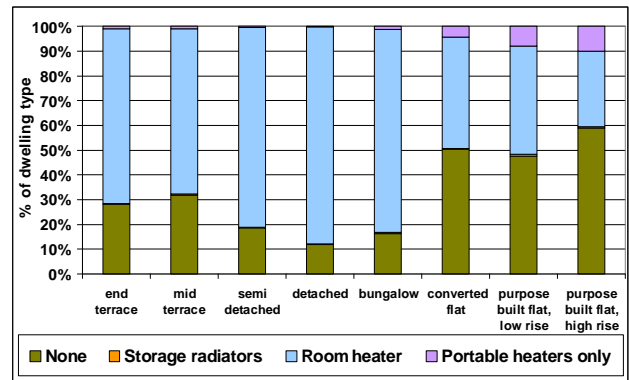


Figure 33: Comparison of secondary space heating systems by dwelling type.

Houses more commonly have some kind of secondary heating system than flats with 49 % of flats and only 21 % of houses having no secondary heating. Houses are generally larger than flats, and therefore more likely to need a form of secondary heating. 14 % of dwellings in the largest fifth of floor areas have no secondary heating, compared to 41 % of dwellings with a in the smallest fifth.

More modern dwellings have a lower proportion of secondary heating with 33 % of post 1965 dwellings having no secondary heating compared to only 22 % of pre-1965 dwellings. This trend may be due to more efficient primary heating systems being fitted in more modern dwellings at the point of construction, negating the need for secondary heating. Also a larger proportion of flats have been built in more recent years.

Fact box: A Closer Look at Secondary Heating.

Since 2003 the EHCS has recorded more detail about secondary heating types, including information about the types of room heaters found in the English housing stock. Figure 34 shows a timeline of secondary heating types since 2003.

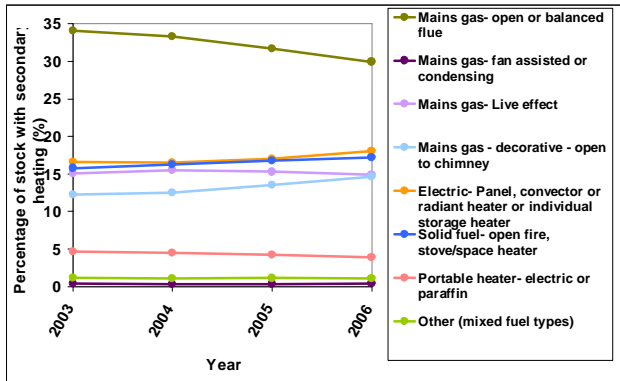


Figure 34: Timeline of secondary space heating types.

Mains gas fires with open or balanced flues are the most common form of secondary heating. However the percentage of dwellings which have secondary heating and use these types of heater has decreased from 34 % in 2003 to 30 % in 2006. The second most common form of secondary heating are fixed electric room heaters, the percentage of these more efficient heaters in dwellings with secondary heating has risen since 2003. However the percentage of less efficient main gas decorative fires which are open to the chimney has also increased during this period. The percentage of solid fuel fired secondary heating has also increased; this type of heating can have varying efficiency dependent upon the type of heater.

More efficient mains gas heaters such as fan assisted and condensing heaters are relatively uncommon, making up less than 1 % of the stock that has secondary heating. Less efficient live effect mains gas fired have remained fairly common, making up about 15 % of the stock that has secondary heating.

Dwelling Location

It is more common in rural areas to have some kind of secondary heating (only 15 % of dwellings in a rural location have no secondary heating compared to 38 % in city and other urban areas). A relatively high proportion of older stock and stock with large floor areas are found in rural locations. London has the highest percentage of dwellings with no secondary heating, as can be seen in Table 6. This might be expected from the urban nature of London and the large proportion of flats in this region.

Region	% with None	% with Room heater	% with Portable heaters only
Yorks & Humber	15.7	83.3	0.8
North East	15.8	82.2	1.6
East Midlands	16.9	81.5	1.0
West Midlands	17.3	80.3	1.9
North West	17.6	81.2	1.0
South West	21.8	75.3	2.1
East England	27.5	69.9	2.1
South East	33.0	64.0	2.6
London	51.0	46.1	2.6
Total	26.1	71.7	1.8

Table 6: Comparison of key secondary space heating systems with region.

We also see that dwellings in northern regions are more likely to have some kind of secondary heating than more southerly regions, possibly because of a slightly colder climate in the north. Also higher proportions of flats and newer buildings in southern regions help account for the lower proportion of secondary heating systems.

Tenure

Owner occupied dwellings have a higher proportion of secondary space heating systems than privately rented, local authority or RSL dwellings, (see figure 35). Only 20 % of owner occupied dwellings have no secondary heating, compared with 43 % of RSL dwellings. Owner occupied dwellings are more likely to be large detached or semi-detached houses, which have a higher percentage of secondary heating systems.

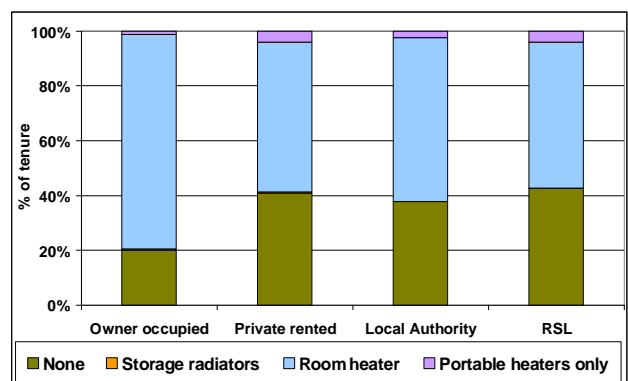


Figure 35: Comparison of secondary space heating systems by tenure.

Household Type

Figure 36 shows a comparison of secondary space heating systems with household groups.

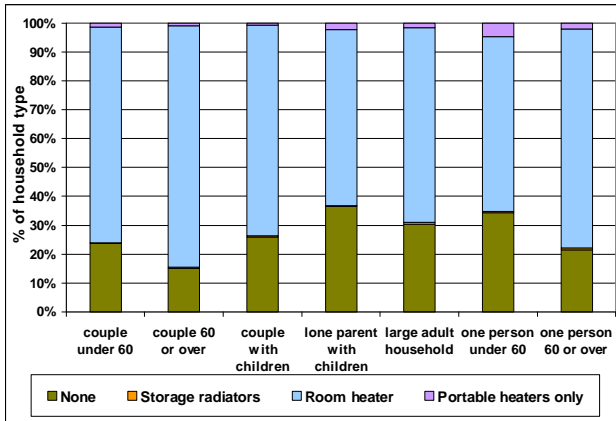


Figure 36: Comparison of secondary space heating systems by household group.

Single person households under the age of 60 commonly live in dwellings where the secondary heating system is portable heaters (5 % of households in this group). This household group are also more likely to live in flats where portable heaters are more common (see figure 33).

A relatively high proportion of younger people live in dwellings with no secondary heating (as shown in figure 37). Those aged 65 or over are most likely to live in dwellings which have secondary heating and for that heating to consist of room heaters.

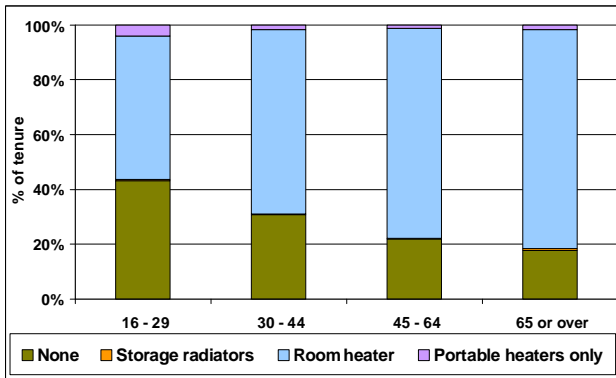


Figure 37: Comparison of secondary space heating systems by age of the household reference person.

Water Heating Systems

The most common method of heating water in the English housing stock is through the same system as the space heating (see Table 7). This is as expected given the dominance of conventional central heating in the housing stock, where the boiler is used to heat water for both direct use and for circulating to radiators.

Water Heating System	Percentage of Total Stock (%)
With central heating	86.0
Dedicated boiler	1.3
Electric immersion heater	10.3
Instantaneous	2.4
Total	100.0

Table 7: Distribution of Water Heating Systems.

The second most common water heating system is electric immersion heaters. It can be seen from figure 38 that since 1991 the proportion of water heating systems that work with the central heating has risen (from 73 % to 86 %), whilst the proportion of electric immersion heaters has fallen (from 26 % to 10 %). In total, around 51 % of English dwellings have an electric immersion heater, however many do not feature in this analysis since they are commonly used as a back up to the primary water heating system. When water is heated by a standard boiler, back boiler or condensing boiler (non-combination), the hot water is stored in a cylinder which may also be fitted with an immersion heater. This immersion heater can then be used if there is a large demand for hot water.

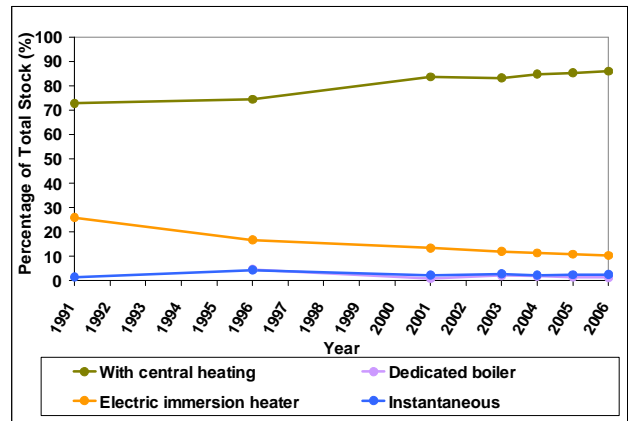


Figure 38: Timeline of water heating systems.

All of the water heating systems are rated as reasonably effective by the households using them with at least 88 % of households rating the water system they use as either very or fairly effective (see figure 39). Water heating systems that work alongside central heating systems are rated as the most effective with only 6 % of households with these systems rating it as not very effective or not at all effective.

Electric immersion heaters are the least likely to be rated as very effective (60 % of households with these systems compared to 71 % of households where the water is heated through the central heating system). These systems may be less popular due to the time taken to heat water and their expense.

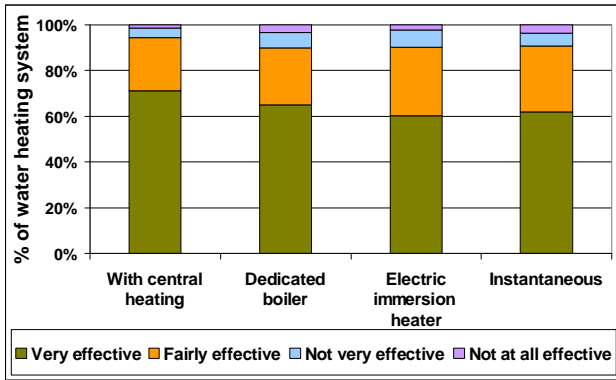


Figure 39: Comparison of water heating system by household rating for water heating.

Fact box: Water heating systems by fuel type.

The most common water heating fuel is gas followed by electricity. From figure 40 it can be seen that gas is by far the most common fuel used for heating water when water is heated with the central heating (93%). This is as expected as most conventional central heating systems are gas fired.

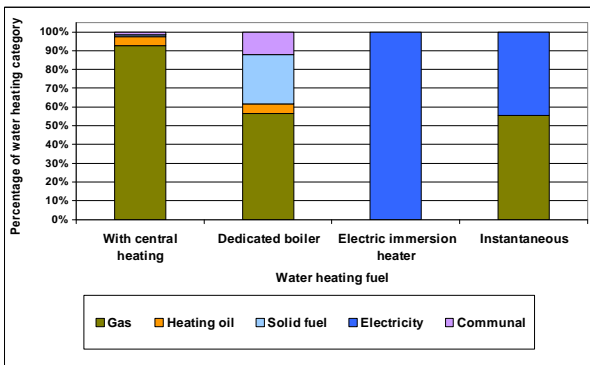


Figure 40: Comparison of water heating fuels with water heating systems.

Gas is also the predominant fuel used by dedicated boilers for water heating (57%). A relatively large proportion of dedicated water boilers are fired by solid fuels (26% of dedicated boilers compared to a tiny minority of systems combined with the central heating). Some range cookers such as Aga's or Rayburns can be fitted with water heating boilers and some can also be used to provide heat for central heating. These cookers typically run on either solid fuel or oil.

The second most common system for heating water is with an electric immersion heater, accounting for electricity being the second most common water heating fuel.

Around half of instantaneous water heaters are gas fired, while the rest heat water using electricity. Instantaneous water heaters can include kettles and electric showers, as well as wall mounted gas fired or electric water heaters which may provide hot water to one or multiple access points.

Dwelling Type

A comparison of water heating systems with dwelling type is shown in figure 41. The proportion of water heating systems that work with the central heating system is much lower in flats (68%) than in houses (90%). The lower incidence of this type of water heating is due to the lower incidence of conventional central heating found in flats.

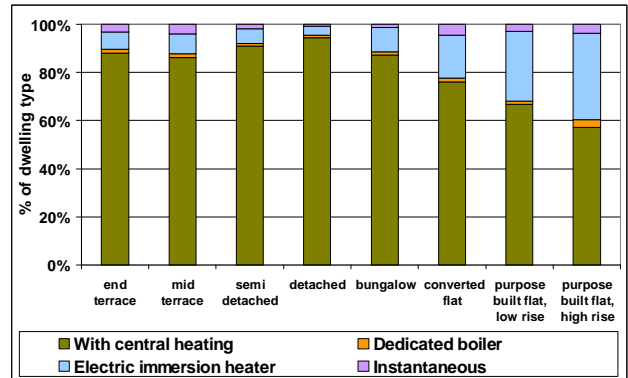


Figure 41: Comparison of water heating systems by dwelling type.

Detached houses have the highest proportion of water heating systems that work with the central heating system (94%); this is as expected as conventional central heating systems are also most common in this form of housing.

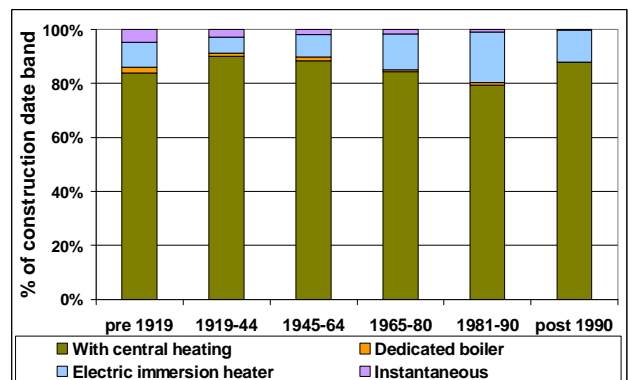


Figure 42: Comparison of water heating systems by dwelling age.

Figure 42 shows a comparison of water heating systems with dwelling construction date. The lowest incidence of centrally heated water systems is in dwellings built between 1981 and 1990 (only 79% of dwellings built in this period). This is because of the large proportion of flats built during this period, which have lower proportions of conventional central heating and therefore water heating systems that work with the central heating.

Pre 1919 dwellings have the highest percentage of instantaneous water heaters (5% of pre 1919 dwellings). 13% of pre 1919 dwellings are converted flats (compared with a stock proportion of only 2%), which have a high incidence of instantaneous water heaters (see Figure 41).

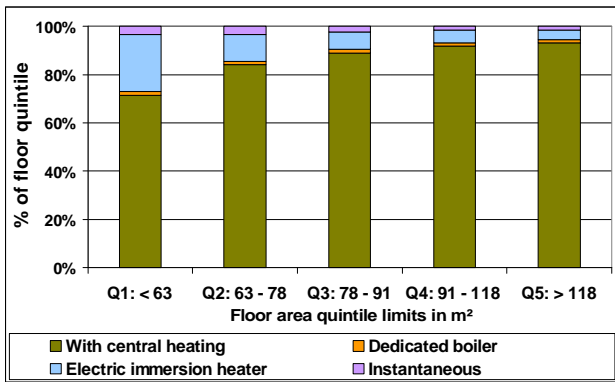


Figure 43: Comparison of water heating system by floor area quintiles.

Higher proportions of water heated by the central heating system are seen with increasing dwelling floor area as shown in figure 43. A large proportion of small dwellings are flats or terraced houses (75 % of the smallest floor area quintile), where the incidence of non-centrally heated water is higher than in semi-detached and detached houses.

Dwelling Location

The South West has the lowest incidence of water heating systems that are combined with the central heating system (83 % of dwellings in the South West have water heating with their central heating, compared to 91 % of dwellings in the North East). This is due to the lower proportion of conventional central heating found in the South West (see fact box on fuel in the South West).

Dwellings in suburban residential areas are the most likely to have centrally heated water (88 % compared to 82 % in city and other urban areas). Suburban areas contain a lower proportion of flats than city and urban areas and are more likely to have connection to mains gas than rural areas, which accounts for this relatively high proportion.

Tenure

Water heated through a central heating system is least common in private rented accommodation (see figure 44), due to the lower proportion of conventional central heating in this sector. Non-centrally heated water in the social sector is almost exclusively provided by an immersion heater, whilst private stock includes a greater range of dedicated boilers and instantaneous systems.

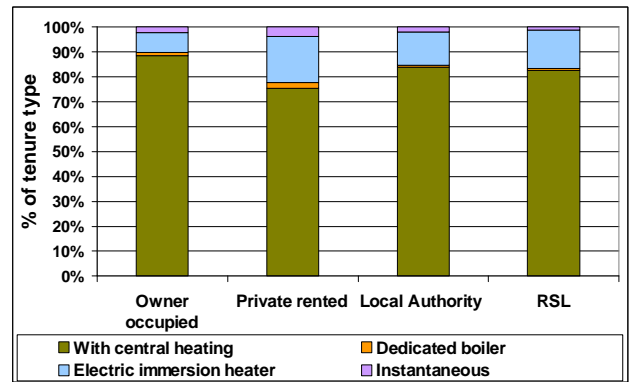


Figure 44: Comparison of water heating system by tenure.

Household Type

Couples with children live in dwellings with the highest proportion of water that is heated by the central heating system (93 %), as seen in figure 45. This is because relatively high proportions of couples with children live in detached houses. Single person households (with occupants over or under 60) are the most likely to live in dwellings where the water is not centrally heated, because a high proportion of this household type live in flats.

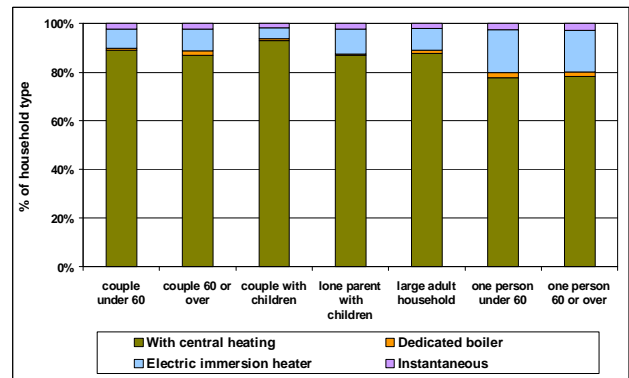


Figure 45: Comparison of water heating system by household group.

Figure 46 shows a comparison of water heating systems with the age of the household reference person. Households with the youngest and oldest HRP's live in dwellings with the lowest proportion of water that is heated by the central heating system. These groups are more likely to live in flats and bungalows where the percentage of centrally heated water is smaller than in other dwelling types.

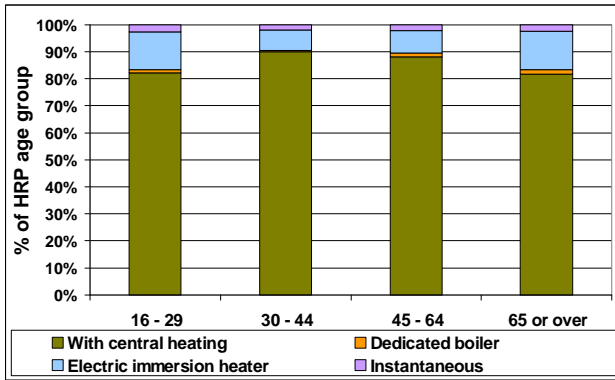


Figure 46: Comparison of water heating system with age of the household reference person.

Conclusions and Future Issues

The efficiency of space and water heating systems in the English housing stock continues to increase with further increases in conventional central heating; gas fired heating systems and centrally heated water. A significant

increase in the proportion of condensing boilers is seen from 2005. The increase in condensing boilers is due to building regulations introduced in 2005, stating that all new and replacement boilers must be condensing.

The proportion of combination boilers has increased significantly since 1991 and this has continued since the introduction of the new building regulations with the more significant take up of condensing-combination boilers compared to standard condensing boilers. Combination boilers are easier to install than standard boilers and are more suitable for use in dwellings with small floor areas, as they do not require a water tank or hot water cylinder.

In the future it may be possible to track the increase in more alternative water heating systems such as solar water heating using data from the EHCS.

Space and Water Heating Update Update Tables 2006

These tables give detailed breakdowns of four main aspects of domestic heating (primary space heating type and fuel, water heating type and boiler type) against key variables, as an appendix to the Space and Water Heating Update Report 2006.

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Table 1.1 Primary space heating system - Proportion of space heating type

	count(000s), (column%)
Primary space heating system	Dwellings
Boiler system with radiators	18,869 (85.8)
Storage radiators	1,532 (7.0)
Warm air system	289 (1.3)
Room heater	867 (3.9)
Other Systems	16 (0.1)
Communal	380 (1.7)
Portable heaters only	37 (0.2)
Total	21,989 (100.0)

Base: All Dwellings

Table 1.2 Primary space heating system - Proportion of space heating type by dwelling type

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
end terrace	1,926 (89.7) (10.2)	84 (3.9) (5.5)	26 (1.2) (8.9)	102 (4.7) (11.8)	2 (0.1) (14.7)	6 (0.3) (1.7)	2 (0.1) (6.3)	2,149 (100.0) (9.8)
mid terrace	3,683 (86.6) (19.5)	185 (4.3) (12.1)	65 (1.5) (22.6)	294 (6.9) (33.9)	5 (0.1) (32.7)	18 (0.4) (4.7)	2 (0.1) (6.7)	4,253 (100.0) (19.3)
semi detached	5,588 (92.5) (29.6)	203 (3.4) (13.2)	47 (0.8) (16.4)	191 (3.2) (22.0)	2 (0.0) (10.9)	1 (0.0) (0.2)	7 (0.1) (19.3)	6,039 (100.0) (27.5)
detached	3,577 (95.8) (19.0)	78 (2.1) (5.1)	51 (1.4) (17.7)	24 (0.6) (2.7)	2 (0.0) (0.0)	2 (0.0) (0.4)	2 (0.0) (4.5)	3,734 (100.0) (17.0)
bungalow	1,729 (87.0) (9.2)	157 (7.9) (10.3)	41 (2.1) (14.3)	41 (2.1) (4.7)	2 (0.1) (12.6)	11 (0.6) (2.9)	5 (0.3) (14.3)	1,987 (100.0) (9.0)
converted flat	556 (74.8) (2.9)	91 (12.2) (5.9)	67 (0.0) (0.0)	67 (9.0) (7.7)	24 (0.0) (0.0)	24 (3.2) (6.3)	6 (0.8) (16.4)	744 (100.0) (3.4)
purpose built flat, low	1,680 (60.8) (8.9)	658 (23.8) (42.9)	44 (1.6) (15.3)	134 (4.9) (15.5)	5 (0.2) (29.2)	230 (8.3) (60.7)	11 (0.4) (29.1)	2,762 (100.0) (12.6)
purpose built flat, hig	128 (39.9) (0.7)	76 (23.7) (5.0)	14 (4.3) (4.8)	14 (4.3) (1.6)	88 (0.0) (0.0)	88 (27.4) (23.2)	1 (0.4) (3.5)	322 (100.0) (1.5)
Total	18,869 (85.8) (100.0)	1,532 (7.0) (100.0)	289 (1.3) (100.0)	867 (3.9) (100.0)	16 (0.1) (100.0)	380 (1.7) (100.0)	37 (0.2) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 1.3 Primary space heating system - Proportion of space heating type by dwelling age

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
pre 1919	4,103 (85.9) (21.7)	262 (5.5) (17.1)	5 (0.1) (1.7)	360 (7.5) (41.6)	(0.0) (0.0)	(0.6) (7.7)	(0.3) (43.1)	4,776 (100.0) (21.7)
1919-44	3,651 (91.2) (19.4)	108 (2.7) (7.1)	(0.0) (0.0)	194 (4.8) (22.3)	(0.0) (0.0)	(1.0) (10.1)	(0.3) (28.3)	4,002 (100.0) (18.2)
1945-64	3,888 (89.1) (20.6)	237 (5.4) (15.5)	52 (1.2) (18.0)	153 (3.5) (17.7)	(0.0) (0.0)	(0.7) (7.7)	(0.1) (6.8)	4,362 (100.0) (19.8)
1965-80	3,898 (80.6) (20.7)	415 (8.6) (27.1)	198 (4.1) (68.4)	104 (2.1) (12.0)	12 (0.2) (75.7)	206 (4.3) (54.3)	(0.1) (17.5)	4,838 (100.0) (22.0)
1981-90	1,418 (77.2) (7.5)	288 (15.7) (18.8)	33 (1.8) (11.4)	43 (2.3) (4.9)	(0.0) (0.0)	(2.9) (13.9)	(0.1) (4.3)	1,836 (100.0) (8.3)
post 1990	1,911 (87.9) (10.1)	221 (10.2) (14.5)	2 (0.1) (0.5)	13 (0.6) (1.5)	4 (0.2) (24.3)	24 (1.1) (6.3)	(0.0) (0.0)	2,174 (100.0) (9.9)
Total	18,869 (85.8) (100.0)	1,532 (7.0) (100.0)	289 (1.3) (100.0)	867 (3.9) (100.0)	16 (0.1) (100.0)	380 (1.7) (100.0)	37 (0.2) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 1.4 Primary space heating system - Proportion of space heating type by floor area

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
Quintile 1: < 63m ²	2,945 (67.0) (15.6)	800 (18.2) (52.2)	65 (1.5) (22.4)	282 (6.4) (32.6)	8 (0.2) (53.4)	275 (6.3) (72.5)	18 (0.4) (48.6)	4,394 (100.0) (20.0)
Quintile 2: 63m ² - 78m ²	3,720 (84.5) (19.7)	298 (6.8) (19.5)	63 (1.4) (21.7)	279 (6.3) (32.2)	4 (0.1) (23.1)	36 (0.8) (9.4)	3 (0.1) (8.0)	4,402 (100.0) (20.0)
Quintile 3: 78m ² - 91m ²	3,956 (90.0) (21.0)	176 (4.0) (11.5)	55 (1.3) (19.0)	174 (4.0) (20.1)	2 (0.0) (10.9)	30 (0.7) (8.0)	4 (0.1) (12.0)	4,398 (100.0) (20.0)
Quintile 4: 91m ² - 118m ²	4,063 (92.4) (21.5)	149 (3.4) (9.8)	66 (1.5) (22.9)	90 (2.0) (10.3)	2 (0.0) (12.6)	25 (0.6) (6.5)	3 (0.1) (9.1)	4,398 (100.0) (20.0)
Quintile 5: > 118m ²	4,185 (95.2) (22.2)	109 (2.5) (7.1)	40 (0.9) (13.9)	42 (1.0) (4.8)	0 (0.0) (0.0)	14 (0.3) (3.7)	8 (0.2) (22.3)	4,398 (100.0) (20.0)
Total	18,869 (85.8) (100.0)	1,532 (7.0) (100.0)	289 (1.3) (100.0)	867 (3.9) (100.0)	16 (0.1) (100.0)	380 (1.7) (100.0)	37 (0.2) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 1.5 Primary space heating system - Proportion of space heating type by dwelling tenure

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
owner occupied	13,858 (89.7)	760 (4.9)	201 (1.3)	569 (3.7)	15 (0.1)	25 (0.2)	14 (0.1)	15,442 (100.0)
private rented	(73.4)	(49.6)	(69.6)	(65.6)	(96.3)	(6.6)	(39.4)	(70.2)
	1,937 (74.2)	351 (13.4)	21 (0.8)	204 (7.8)		81 (3.1)	16 (0.6)	2,611 (100.0)
	(10.3)	(22.9)	(7.4)	(23.6)	(0.0)	(21.3)	(44.3)	(11.9)
local authority	1,658 (79.5)	174 (8.3)	42 (2.0)	66 (3.2)	1 (0.0)	141 (6.8)	4 (0.2)	2,086 (100.0)
	(8.8)	(11.3)	(14.5)	(7.6)	(3.7)	(37.3)	(10.5)	(9.5)
RSL	1,416 (76.5)	247 (13.4)	25 (1.3)	28 (1.5)		132 (7.2)	2 (0.1)	1,850 (100.0)
	(7.5)	(16.2)	(8.6)	(3.2)	(0.0)	(34.9)	(5.9)	(8.4)
Total	18,869 (85.8)	1,532 (7.0)	289 (1.3)	867 (3.9)	16 (0.1)	380 (1.7)	37 (0.2)	21,989 (100.0)
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Base: All Dwellings

Table 1.6 Primary space heating system - Proportion of space heating type by household composition

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
couple under 60	3,576 (89.9) (19.6)	196 (4.9) (13.8)	52 (1.3) (18.3)	125 (3.1) (16.4)	2 (0.0) (14.6)	27 (0.7) (8.7)	2 (0.0) (5.9)	3,979 (100.0) (18.9)
couple 60 or over	3,095 (87.8) (17.0)	220 (6.2) (15.4)	53 (1.5) (18.7)	117 (3.3) (15.3)	7 (0.2) (60.8)	29 (0.8) (9.2)	4 (0.1) (11.7)	3,525 (100.0) (16.7)
couple with children	4,812 (94.1) (26.4)	134 (2.6) (9.4)	46 (0.9) (16.2)	95 (1.9) (12.5)	2 (0.0) (19.7)	20 (0.4) (6.3)	5 (0.1) (15.2)	5,114 (100.0) (24.3)
lone parent with children	1,317 (86.9) (7.2)	104 (6.9) (7.3)	31 (2.0) (10.7)	47 (3.1) (6.1)	0 (0.0) (0.0)	16 (1.0) (5.0)	1 (0.1) (4.4)	1,516 (100.0) (7.2)
large adult household	1,283 (88.9) (7.0)	79 (5.5) (5.6)	9 (0.6) (3.0)	56 (3.9) (7.4)	0 (0.0) (0.0)	13 (0.9) (4.2)	4 (0.3) (12.3)	1,444 (100.0) (6.9)
one person under 60	1,920 (76.6) (10.5)	339 (13.5) (23.9)	38 (1.5) (13.3)	143 (5.7) (18.8)	0 (0.0) (0.0)	58 (2.3) (18.3)	9 (0.4) (28.7)	2,507 (100.0) (11.9)
one person 60 or over	2,226 (75.0) (12.2)	350 (11.8) (24.6)	56 (1.9) (19.7)	178 (6.0) (23.5)	1 (0.0) (5.0)	152 (5.1) (48.2)	7 (0.2) (21.8)	2,970 (100.0) (14.1)
Total	18,230 (86.6) (100.0)	1,421 (6.7) (100.0)	285 (1.4) (100.0)	760 (3.6) (100.0)	12 (0.1) (100.0)	315 (1.5) (100.0)	33 (0.2) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 1.7 Primary space heating system - Proportion of space heating type by age of the household representative

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
16 - 29	1,431 (82.4) (7.8)	182 (10.5) (12.8)	20 (1.2) (7.1)	68 (3.9) (9.0)	(0.0) (0.0)	(1.4) (7.9)	9 (0.5) (29.1)	1,736 (100.0) (8.2)
30 - 44	5,683 (90.3) (31.2)	325 (5.2) (22.9)	50 (0.8) (17.6)	164 (2.6) (21.6)	2 (0.0) (19.7)	60 (0.9) (19.0)	11 (0.2) (34.5)	6,296 (100.0) (29.9)
45 - 64	6,825 (88.5) (37.4)	392 (5.1) (27.6)	133 (1.7) (46.5)	270 (3.5) (35.5)	7 (0.1) (58.4)	77 (1.0) (24.5)	5 (0.1) (16.4)	7,709 (100.0) (36.6)
65 or over	4,291 (80.7) (23.5)	521 (9.8) (36.7)	82 (1.5) (28.8)	258 (4.9) (33.9)	3 (0.0) (21.9)	153 (2.9) (48.6)	7 (0.1) (20.1)	5,314 (100.0) (25.2)
Total	18,230 (86.6) (100.0)	1,421 (6.7) (100.0)	285 (1.4) (100.0)	760 (3.6) (100.0)	12 (0.1) (100.0)	315 (1.5) (100.0)	33 (0.2) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 1.8 Primary space heating system - Proportion of space heating type by household income

	count(000s), (row%), (column%)							
	Boiler system with radiators	Storage radiators	Warm air system	Room heater	Other systems	Communal	Portable heaters only	Total
Q1: <£10k	3,229 (76.9) (17.7)	469 (11.2) (33.0)	72 (1.7) (25.2)	250 (6.0) (32.9)	(0.0) (0.0)	169 (4.0) (53.8)	9 (0.2) (27.6)	4,198 (100.0) (19.9)
Q2: £10k-£15k	3,498 (83.2) (19.2)	337 (8.0) (23.7)	64 (1.5) (22.5)	228 (5.4) (30.1)	4 (0.1) (36.0)	66 (1.6) (21.1)	8 (0.2) (23.5)	4,206 (100.0) (20.0)
Q3: £15k-£22k	3,688 (87.6) (20.2)	272 (6.5) (19.1)	46 (1.1) (16.1)	154 (3.7) (20.2)	2 (0.0) (16.9)	42 (1.0) (13.4)	8 (0.2) (23.5)	4,211 (100.0) (20.0)
Q4: £22k-£33k	3,828 (90.8) (21.0)	213 (5.0) (15.0)	54 (1.3) (19.0)	79 (1.9) (10.4)	5 (0.1) (47.1)	30 (0.7) (9.4)	6 (0.2) (19.7)	4,216 (100.0) (20.0)
Q5: >£33k	3,986 (94.4) (21.9)	130 (3.1) (9.2)	49 (1.2) (17.1)	49 (1.2) (6.4)	(0.0) (0.0)	7 (0.2) (2.3)	2 (0.0) (5.7)	4,223 (100.0) (20.1)
Total	18,230 (86.6) (100.0)	1,421 (6.7) (100.0)	285 (1.4) (100.0)	760 (3.6) (100.0)	12 (0.1) (100.0)	315 (1.5) (100.0)	33 (0.2) (100.0)	21,055 (100.0) (100.0)

Base: All Households

Table 2.1 Primary space heating fuel - Proportion of space heating fuel

count(000s), (column%)	
Primary space heating fuel	Dwellings
Gas fired system	18,557 (84.4)
Oil fired system	915 (4.2)
Solid fuel fired system	325 (1.5)
Electrical system	1,812 (8.2)
Communal system	380 (1.7)
Total	21,989 (100.0)

Base: All Dwellings

Table 2.2 Primary space heating fuel - Proportion of space heating fuel by dwelling type

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
end terrace	1,955 (91.0) (10.5)	39 (1.8) (4.3)	37 (1.7) (11.4)	112 (5.2) (6.2)	6 (0.3) (1.7)	2,149 (100.0) (9.8)
mid terrace	3,920 (92.2) (21.1)	28 (0.7) (3.0)	65 (1.5) (20.0)	222 (5.2) (12.2)	18 (0.4) (4.7)	4,253 (100.0) (19.3)
semi detached	5,471 (90.6) (29.5)	190 (3.2) (20.8)	130 (2.2) (40.1)	246 (4.1) (13.6)	1 (0.0) (0.2)	6,039 (100.0) (27.5)
detached	3,127 (83.7) (16.8)	484 (13.0) (52.9)	29 (0.8) (8.9)	93 (2.5) (5.1)	2 (0.0) (0.4)	3,734 (100.0) (17.0)
bungalow	1,589 (80.0) (8.6)	169 (8.5) (18.4)	43 (2.2) (13.4)	175 (8.8) (9.6)	11 (0.6) (2.9)	1,987 (100.0) (9.0)
converted flat	567 (76.2) (3.1)	4 (0.6) (0.5)	13 (1.8) (4.1)	136 (18.2) (7.5)	24 (3.2) (6.3)	744 (100.0) (3.4)
purpose built flat, l	1,787 (64.7) (9.6)	1 (0.0) (0.1)	7 (0.3) (2.2)	737 (26.7) (40.7)	230 (8.3) (60.7)	2,762 (100.0) (12.6)
purpose built flat, r	141 (43.9) (0.8)	0 (0.0) (0.0)	0 (0.0) (0.0)	92 (28.7) (5.1)	88 (27.4) (23.2)	322 (100.0) (1.5)
Total	18,557 (84.4) (100.0)	915 (4.2) (100.0)	325 (1.5) (100.0)	1,812 (8.2) (100.0)	380 (1.7) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 2.3 Primary space heating fuel - Proportion of space heating fuel by dwelling age

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
pre 1919	3,878 (81.2) (20.9)	372 (7.8) (40.6)	144 (3.0) (44.4)	353 (7.4) (19.5)	29 (0.6) (7.7)	4,776 (100.0) (21.7)
1919-44	3,670 (91.7) (19.8)	70 (1.8) (7.7)	69 (1.7) (21.1)	154 (3.9) (8.5)	38 (1.0) (10.1)	4,002 (100.0) (18.2)
1945-64	3,874 (88.8) (20.9)	129 (3.0) (14.1)	63 (1.4) (19.3)	267 (6.1) (14.8)	29 (0.7) (7.7)	4,362 (100.0) (19.8)
1965-80	3,896 (80.5) (21.0)	203 (4.2) (22.2)	41 (0.8) (12.7)	492 (10.2) (27.2)	206 (4.3) (54.3)	4,838 (100.0) (22.0)
1981-90	1,410 (76.8) (7.6)	54 (2.9) (5.9)	8 (0.5) (2.6)	311 (16.9) (17.2)	53 (2.9) (13.9)	1,836 (100.0) (8.3)
post 1990	1,830 (84.1) (9.9)	87 (4.0) (9.5)	325 (0.0) (0.0)	234 (10.7) (12.9)	24 (1.1) (6.3)	2,174 (100.0) (9.9)
Total	18,557 (84.4) (100.0)	915 (4.2) (100.0)	325 (1.5) (100.0)	1,812 (8.2) (100.0)	380 (1.7) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 2.4 Primary space heating fuel - Proportion of space heating fuel by floor area

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
Quintile 1: < 63m ²	3,114 (70.9) (16.8)	29 (0.7) (3.2)	41 (0.9) (12.7)	934 (21.3) (51.6)	275 (6.3) (72.5)	4,394 (100.0) (20.0)
Quintile 2: 63m ² - 78m ²	3,880 (88.1) (20.9)	59 (1.3) (6.5)	69 (1.6) (21.3)	357 (8.1) (19.7)	36 (0.8) (9.4)	4,402 (100.0) (20.0)
Quintile 3: 78m ² - 91m ²	3,950 (89.8) (21.3)	86 (2.0) (9.4)	107 (2.4) (32.8)	224 (5.1) (12.4)	30 (0.7) (8.0)	4,398 (100.0) (20.0)
Quintile 4: 91m ² - 118m ²	3,975 (90.4) (21.4)	160 (3.6) (17.5)	71 (1.6) (21.9)	167 (3.8) (9.2)	25 (0.6) (6.5)	4,398 (100.0) (20.0)
Quintile 5: > 118m ²	3,638 (82.7) (19.6)	581 (13.2) (63.4)	37 (0.8) (11.3)	129 (2.9) (7.1)	14 (0.3) (3.7)	4,398 (100.0) (20.0)
Total	18,557 (84.4) (100.0)	915 (4.2) (100.0)	325 (1.5) (100.0)	1,812 (8.2) (100.0)	380 (1.7) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 2.5 Primary space heating fuel - Proportion of space heating fuel by dwelling tenure

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
owner occupied	13,503 (87.4)	796 (5.2)	200 (1.3)	918 (5.9)	25 (0.2)	15,442 (100.0)
private rented	(72.8)	(87.0)	(61.4)	(50.7)	(6.6)	(70.2)
	1,932 (74.0)	92 (3.5)	73 (2.8)	433 (16.6)	81 (3.1)	2,611 (100.0)
	(10.4)	(10.0)	(22.3)	(23.9)	(21.3)	(11.9)
local authority	1,705 (81.7)	11 (0.5)	32 (1.6)	196 (9.4)	141 (6.8)	2,086 (100.0)
	(9.2)	(1.2)	(10.0)	(10.8)	(37.3)	(9.5)
RSL	1,417 (76.6)	16 (0.9)	20 (1.1)	264 (14.3)	132 (7.2)	1,850 (100.0)
	(7.6)	(1.7)	(6.2)	(14.6)	(34.9)	(8.4)
Total	18,557 (84.4)	915 (4.2)	325 (1.5)	1,812 (8.2)	380 (1.7)	21,989 (100.0)
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Base: All Dwellings

Table 2.6 Primary space heating fuel - Proportion of space heating fuel by household composition

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
couple under 60	3,442 (86.5) (19.2)	207 (5.2) (23.2)	68 (1.7) (23.3)	235 (5.9) (14.3)	27 (0.7) (8.7)	3,979 (100.0) (18.9)
couple 60 or over	2,968 (84.2) (16.6)	226 (6.4) (25.3)	48 (1.4) (16.4)	254 (7.2) (15.4)	29 (0.8) (9.2)	3,525 (100.0) (16.7)
couple with children	4,618 (90.3) (25.8)	281 (5.5) (31.5)	38 (0.7) (12.9)	157 (3.1) (9.6)	20 (0.4) (6.3)	5,114 (100.0) (24.3)
lone parent with children	1,338 (88.3) (7.5)	22 (1.5) (2.5)	17 (1.1) (5.8)	122 (8.1) (7.4)	16 (1.0) (5.0)	1,516 (100.0) (7.2)
large adult household	1,291 (89.4) (7.2)	32 (2.2) (3.6)	19 (1.3) (6.6)	88 (6.1) (5.4)	13 (0.9) (4.2)	1,444 (100.0) (6.9)
one person under 60	1,986 (79.2) (11.1)	36 (1.4) (4.0)	38 (1.5) (13.0)	389 (15.5) (23.7)	58 (2.3) (18.3)	2,507 (100.0) (11.9)
one person 60 or over	2,267 (76.3) (12.7)	89 (3.0) (9.9)	64 (2.2) (21.9)	399 (13.4) (24.2)	152 (5.1) (48.2)	2,970 (100.0) (14.1)
Total	17,910 (85.1) (100.0)	893 (4.2) (100.0)	292 (1.4) (100.0)	1,645 (7.8) (100.0)	315 (1.5) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 2.7 Primary space heating fuel - Proportion of space heating fuel by the age of the household representative

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
16 - 29	1,462 (84.2)	15 (0.9)	14 (0.8)	221 (12.7)	25 (1.4)	1,736 (100.0)
	(8.2)	(1.7)	(4.7)	(13.4)	(7.9)	(8.2)
30 - 44	5,572 (88.5)	235 (3.7)	52 (0.8)	377 (6.0)	60 (0.9)	6,296 (100.0)
	(31.1)	(26.3)	(17.8)	(22.9)	(19.0)	(29.9)
45 - 64	6,631 (86.0)	421 (5.5)	121 (1.6)	457 (5.9)	77 (1.0)	7,709 (100.0)
	(37.0)	(47.2)	(41.6)	(27.8)	(24.5)	(36.6)
65 or over	4,245 (79.9)	222 (4.2)	105 (2.0)	590 (11.1)	153 (2.9)	5,314 (100.0)
	(23.7)	(24.8)	(35.9)	(35.9)	(48.6)	(25.2)
Total	17,910 (85.1)	893 (4.2)	292 (1.4)	1,645 (7.8)	315 (1.5)	21,055 (100.0)
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Base: All Dwellings

Table 2.8 Primary space heating fuel - Proportion of space heating fuel by household income

	count(000s), (row%), (column%)					
	Gas fired system	Oil fired system	Solid fuel fired system	Electrical system	Communal system	Total
Q1: <£10k	3,312 (78.9) (18.5)	75 (1.8) (8.4)	109 (2.6) (37.2)	534 (12.7) (32.4)	169 (4.0) (53.8)	4,198 (100.0) (19.9)
Q2: £10k-£15k	3,552 (84.4) (19.8)	123 (2.9) (13.8)	70 (1.7) (24.1)	394 (9.4) (24.0)	66 (1.6) (21.1)	4,206 (100.0) (20.0)
Q3: £15k-£22k	3,636 (86.3) (20.3)	165 (3.9) (18.5)	47 (1.1) (16.1)	321 (7.6) (19.5)	42 (1.0) (13.4)	4,211 (100.0) (20.0)
Q4: £22k-£33k	3,723 (88.3) (20.8)	173 (4.1) (19.4)	41 (1.0) (14.0)	249 (5.9) (15.1)	30 (0.7) (9.4)	4,216 (100.0) (20.0)
Q5: >£33k	3,687 (87.3) (20.6)	356 (8.4) (39.9)	25 (0.6) (8.5)	147 (3.5) (9.0)	7 (0.2) (2.3)	4,223 (100.0) (20.1)
Total	17,910 (85.1) (100.0)	893 (4.2) (100.0)	292 (1.4) (100.0)	1,645 (7.8) (100.0)	315 (1.5) (100.0)	21,055 (100.0) (100.0)

Base: All Households

Table 3.1 Water heating system - Proportion of water heating system

	count(000s), (column%)
Water heating system	Dwellings
With central heating	18,904 (86.0)
Dedicated boiler	289 (1.3)
Electric immersion heater	2,260 (10.3)
Instantaneous (including kettles)	536 (2.4)
Total	21,989 (100.0)

Base: All Dwellings

Table 3.2 Water heating system - Proportion of water heating system by dwelling type

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
end terrace	1,894 (88.1) (10.0)	30 (1.4) (10.5)	157 (7.3) (6.9)	67 (3.1) (12.6)	2,149 (100.0) (9.8)
mid terrace	3,668 (86.3) (19.4)	63 (1.5) (22.0)	351 (8.2) (15.5)	170 (4.0) (31.8)	4,253 (100.0) (19.3)
semi detached	5,491 (90.9) (29.0)	73 (1.2) (25.1)	357 (5.9) (15.8)	118 (2.0) (22.0)	6,039 (100.0) (27.5)
detached	3,526 (94.4) (18.7)	39 (1.0) (13.4)	138 (3.7) (6.1)	31 (0.8) (5.8)	3,734 (100.0) (17.0)
bungalow	1,733 (87.2) (9.2)	26 (1.3) (9.0)	202 (10.2) (9.0)	26 (1.3) (4.8)	1,987 (100.0) (9.0)
converted flat	565 (75.9) (3.0)	13 (1.8) (4.7)	132 (17.7) (5.8)	34 (4.5) (6.3)	744 (100.0) (3.4)
purpose built flat,	1,844 (66.7) (9.8)	34 (1.2) (11.6)	808 (29.2) (35.7)	77 (2.8) (14.4)	2,762 (100.0) (12.6)
purpose built flat,	184 (57.1) (1.0)	11 (3.3) (3.6)	115 (35.8) (5.1)	12 (3.8) (2.3)	322 (100.0) (1.5)
Total	18,904 (86.0) (100.0)	289 (1.3) (100.0)	2,260 (10.3) (100.0)	536 (2.4) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 3.3 Water heating system - Proportion of water heating system by dwelling age

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
pre 1919	4,005 (83.9) (21.2)	108 (2.3) (37.3)	436 (9.1) (19.3)	227 (4.8) (42.4)	4,776 (100.0) (21.7)
1919-44	3,600 (89.9) (19.0)	54 (1.3) (18.6)	237 (5.9) (10.5)	112 (2.8) (20.9)	4,002 (100.0) (18.2)
1945-64	3,852 (88.3) (20.4)	69 (1.6) (24.1)	354 (8.1) (15.6)	87 (2.0) (16.3)	4,362 (100.0) (19.8)
1965-80	4,082 (84.4) (21.6)	37 (0.8) (12.9)	633 (13.1) (28.0)	86 (1.8) (16.0)	4,838 (100.0) (22.0)
1981-90	1,456 (79.3) (7.7)	18 (1.0) (6.2)	345 (18.8) (15.3)	16 (0.9) (3.1)	1,836 (100.0) (8.3)
post 1990	1,909 (87.8) (10.1)	3 (0.1) (0.9)	255 (11.7) (11.3)	7 (0.3) (1.4)	2,174 (100.0) (9.9)
Total	18,904 (86.0) (100.0)	289 (1.3) (100.0)	2,260 (10.3) (100.0)	536 (2.4) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 3.4 Water heating system - Proportion of water heating system by floor area

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
Quintile 1: < 63m ²	3,143 (71.5) (16.6)	62 (1.4) (21.5)	1,041 (23.7) (46.1)	148 (3.4) (27.6)	4,394 (100.0) (20.0)
Quintile 2: 63m ² - 78m ²	3,709 (84.3) (19.6)	51 (1.2) (17.7)	490 (11.1) (21.7)	151 (3.4) (28.3)	4,402 (100.0) (20.0)
Quintile 3: 78m ² - 91m ²	3,913 (89.0) (20.7)	62 (1.4) (21.3)	320 (7.3) (14.1)	104 (2.4) (19.4)	4,398 (100.0) (20.0)
Quintile 4: 91m ² - 118m ²	4,041 (91.9) (21.4)	59 (1.3) (20.3)	236 (5.4) (10.4)	62 (1.4) (11.7)	4,398 (100.0) (20.0)
Quintile 5: > 118m ²	4,099 (93.2) (21.7)	56 (1.3) (19.3)	174 (4.0) (7.7)	70 (1.6) (13.1)	4,398 (100.0) (20.0)
Total	18,904 (86.0) (100.0)	289 (1.3) (100.0)	2,260 (10.3) (100.0)	536 (2.4) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 3.5 Water heating system - Proportion of water heating system by dwelling tenure

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
owner occupied	13,659 (88.5) (72.3)	201 (1.3) (69.5)	1,212 (7.8) (53.6)	371 (2.4) (69.2)	15,442 (100.0) (70.2)
private rented	1,967 (75.3) (10.4)	58 (2.2) (20.2)	485 (18.6) (21.4)	101 (3.9) (18.8)	2,611 (100.0) (11.9)
local authority	1,750 (83.9) (9.3)	16 (0.8) (5.4)	278 (13.3) (12.3)	42 (2.0) (7.9)	2,086 (100.0) (9.5)
RSL	1,529 (82.6) (8.1)	14 (0.8) (4.9)	285 (15.4) (12.6)	22 (1.2) (4.1)	1,850 (100.0) (8.4)
Total	18,904 (86.0) (100.0)	289 (1.3) (100.0)	2,260 (10.3) (100.0)	536 (2.4) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 3.6 Water heating system - Proportion of water heating system by household composition

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
couple under 60	3,541 (89.0) (19.4)	33 (0.8) (12.9)	313 (7.9) (14.9)	92 (2.3) (20.0)	3,979 (100.0) (18.9)
couple 60 or over	3,066 (87.0) (16.8)	61 (1.7) (23.8)	322 (9.1) (15.3)	77 (2.2) (16.6)	3,525 (100.0) (16.7)
couple with children	4,763 (93.1) (26.1)	34 (0.7) (13.3)	228 (4.5) (10.8)	89 (1.7) (19.3)	5,114 (100.0) (24.3)
lone parent with children	1,320 (87.1) (7.2)	8 (0.5) (3.2)	154 (10.2) (7.3)	34 (2.2) (7.3)	1,516 (100.0) (7.2)
large adult household	1,267 (87.7) (6.9)	18 (1.3) (7.2)	129 (8.9) (6.1)	30 (2.1) (6.5)	1,444 (100.0) (6.9)
one person under 60	1,952 (77.9) (10.7)	48 (1.9) (18.7)	448 (17.9) (21.3)	60 (2.4) (13.0)	2,507 (100.0) (11.9)
one person 60 or over	2,324 (78.3) (12.7)	54 (1.8) (21.0)	513 (17.3) (24.3)	80 (2.7) (17.3)	2,970 (100.0) (14.1)
Total	18,232 (86.6) (100.0)	255 (1.2) (100.0)	2,106 (10.0) (100.0)	461 (2.2) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 3.7 Water heating system - Proportion of water heating system by the age of the household representative

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
16 - 29	1,427 (82.2) (7.8)	20 (1.1) (7.7)	245 (14.1) (11.6)	44 (2.5) (9.5)	1,736 (100.0) (8.2)
30 - 44	5,668 (90.0) (31.1)	29 (0.5) (11.5)	483 (7.7) (23.0)	115 (1.8) (24.9)	6,296 (100.0) (29.9)
45 - 64	6,792 (88.1) (37.3)	114 (1.5) (44.8)	632 (8.2) (30.0)	170 (2.2) (36.9)	7,709 (100.0) (36.6)
65 or over	4,345 (81.8) (23.8)	92 (1.7) (36.0)	746 (14.0) (35.4)	132 (2.5) (28.7)	5,314 (100.0) (25.2)
Total	18,232 (86.6) (100.0)	255 (1.2) (100.0)	2,106 (10.0) (100.0)	461 (2.2) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 3.8 Water heating system - Proportion of water heating system by household income

	count(000s), (row%), (column%)				
	With central heating	Dedicated boiler	Electric immersion heater	Instantaneous	Total
Q1: <£10k	3,335 (79.4) (18.3)	79 (1.9) (31.0)	661 (15.8) (31.4)	123 (2.9) (26.7)	4,198 (100.0) (19.9)
Q2: £10k-£15k	3,479 (82.7) (19.1)	76 (1.8) (29.8)	540 (12.8) (25.6)	111 (2.6) (24.2)	4,206 (100.0) (20.0)
Q3: £15k-£22k	3,682 (87.4) (20.2)	38 (0.9) (14.8)	408 (9.7) (19.3)	84 (2.0) (18.2)	4,211 (100.0) (20.0)
Q4: £22k-£33k	3,801 (90.2) (20.8)	41 (1.0) (15.9)	299 (7.1) (14.2)	75 (1.8) (16.3)	4,216 (100.0) (20.0)
Q5: >£33k	3,935 (93.2) (21.6)	22 (0.5) (8.6)	198 (4.7) (9.4)	67 (1.6) (14.6)	4,223 (100.0) (20.1)
Total	18,232 (86.6) (100.0)	255 (1.2) (100.0)	2,106 (10.0) (100.0)	461 (2.2) (100.0)	21,055 (100.0) (100.0)

Base: All Households

Table 4.1 Type of boiler - Proportion of boiler type

Type of boiler	count(000s), (column%) Dwellings
Standard boiler	9,014 (41.0)
Back boiler	2,131 (9.7)
Combination boiler	6,312 (28.7)
Condensing boiler	460 (2.1)
Condensing- combination boiler	1,297 (5.9)
No boiler	2,775 (12.6)
Total	21,989 (100.0)

Base: All Dwellings

Table 4.2 Type of boiler - Proportion of boiler type by dwelling type

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
end terrace	818 (38.1) (9.1)	269 (12.5) (12.6)	707 (32.9) (11.2)	43 (2.0) (9.3)	115 (5.4) (8.9)	197 (9.1) (7.1)	2,149 (100.0) (9.8)
mid terrace	1,414 (33.3) (15.7)	457 (10.8) (21.5)	1,538 (36.2) (24.4)	67 (1.6) (14.6)	272 (6.4) (21.0)	504 (11.8) (18.1)	4,253 (100.0) (19.3)
semi detached	2,533 (42.0) (28.1)	824 (13.6) (38.7)	1,767 (29.3) (28.0)	111 (1.8) (24.1)	401 (6.6) (30.9)	403 (6.7) (14.5)	6,039 (100.0) (27.5)
detached	2,555 (68.4) (28.3)	102 (2.7) (4.8)	616 (16.5) (9.8)	172 (4.6) (37.5)	182 (4.9) (14.1)	105 (2.8) (3.8)	3,734 (100.0) (17.0)
bungalow	849 (42.7) (9.4)	267 (13.4) (12.5)	513 (25.8) (8.1)	37 (1.8) (8.0)	105 (5.3) (8.1)	216 (10.9) (7.8)	1,987 (100.0) (9.0)
converted flat	133 (17.9) (1.5)	30 (4.1) (1.4)	336 (45.2) (5.3)	2 (0.2) (0.3)	57 (7.7) (4.4)	186 (25.0) (6.7)	744 (100.0) (3.4)
purpose built flat, lo	607 (22.0) (6.7)	178 (6.4) (8.3)	793 (28.7) (12.6)	26 (0.9) (5.7)	161 (5.8) (12.4)	998 (36.1) (36.0)	2,762 (100.0) (12.6)
purpose built flat, hi	104 (32.1) (1.1)	4 (1.2) (0.2)	42 (13.1) (0.7)	2 (0.8) (0.5)	2 (0.7) (0.2)	168 (52.1) (6.0)	322 (100.0) (1.5)
Total	9,014 (41.0) (100.0)	2,131 (9.7) (100.0)	6,312 (28.7) (100.0)	460 (2.1) (100.0)	1,297 (5.9) (100.0)	2,775 (12.6) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 4.3 Type of boiler - Proportion of boiler type by dwelling age

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
pre 1919	1,531 (32.1) (17.0)	368 (7.7) (17.3)	1,812 (37.9) (28.7)	65 (1.4) (14.1)	333 (7.0) (25.7)	666 (13.9) (24.0)	4,776 (100.0) (21.7)
1919-44	1,448 (36.2) (16.1)	483 (12.1) (22.7)	1,407 (35.2) (22.3)	71 (1.8) (15.4)	254 (6.3) (19.6)	339 (8.5) (12.2)	4,002 (100.0) (18.2)
1945-64	1,546 (35.4) (17.2)	794 (18.2) (37.3)	1,228 (28.1) (19.4)	87 (2.0) (19.0)	286 (6.6) (22.0)	422 (9.7) (15.2)	4,362 (100.0) (19.8)
1965-80	2,293 (47.4) (25.4)	407 (8.4) (19.1)	1,075 (22.2) (17.0)	113 (2.3) (24.7)	231 (4.8) (17.8)	719 (14.9) (25.9)	4,838 (100.0) (22.0)
1981-90	987 (53.8) (11.0)	61 (3.3) (2.9)	304 (16.6) (4.8)	33 (1.8) (7.1)	76 (4.2) (5.9)	374 (20.4) (13.5)	1,836 (100.0) (8.3)
post 1990	1,208 (55.6) (13.4)	18 (0.8) (0.8)	486 (22.4) (7.7)	91 (4.2) (19.8)	117 (5.4) (9.0)	255 (11.7) (9.2)	2,174 (100.0) (9.9)
Total	9,014 (41.0) (100.0)	2,131 (9.7) (100.0)	6,312 (28.7) (100.0)	460 (2.1) (100.0)	1,297 (5.9) (100.0)	2,775 (12.6) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 4.4 Type of boiler - Proportion of boiler type by floor area

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
Quintile 1: < 63m ²	1,115 (25.4) (12.4)	400 (9.1) (18.8)	1,234 (28.1) (19.6)	40 (0.9) (8.8)	270 (6.2) (20.9)	1,333 (30.3) (48.0)	4,394 (100.0) (20.0)
Quintile 2: 63m ² - 78m ²	1,460 (33.2) (16.2)	551 (12.5) (25.9)	1,482 (33.7) (23.5)	58 (1.3) (12.5)	234 (5.3) (18.0)	617 (14.0) (22.2)	4,402 (100.0) (20.0)
Quintile 3: 78m ² - 91m ²	1,657 (37.7) (18.4)	644 (14.6) (30.2)	1,366 (31.1) (21.6)	77 (1.8) (16.8)	270 (6.1) (20.8)	383 (8.7) (13.8)	4,398 (100.0) (20.0)
Quintile 4: 91m ² - 118m ²	2,052 (46.7) (22.8)	398 (9.0) (18.7)	1,318 (30.0) (20.9)	73 (1.7) (15.9)	288 (6.5) (22.2)	269 (6.1) (9.7)	4,398 (100.0) (20.0)
Quintile 5: > 118m ²	2,729 (62.0) (30.3)	139 (3.2) (6.5)	911 (20.7) (14.4)	212 (4.8) (46.1)	235 (5.3) (18.1)	172 (3.9) (6.2)	4,398 (100.0) (20.0)
Total	9,014 (41.0) (100.0)	2,131 (9.7) (100.0)	6,312 (28.7) (100.0)	460 (2.1) (100.0)	1,297 (5.9) (100.0)	2,775 (12.6) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 4.5 Type of boiler - Proportion of boiler type by dwelling tenure

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
owner occupied	7,029 (45.5) (78.0)	1,297 (8.4) (60.9)	4,466 (28.9) (70.7)	351 (2.3) (76.2)	919 (6.0) (70.9)	1,380 (8.9) (49.7)	15,442 (100.0) (70.2)
private rented	756 (29.0) (8.4)	195 (7.5) (9.2)	867 (33.2) (13.7)	17 (0.7) (3.7)	139 (5.3) (10.7)	637 (24.4) (23.0)	2,611 (100.0) (11.9)
local authority	648 (31.1) (7.2)	388 (18.6) (18.2)	491 (23.6) (7.8)	54 (2.6) (11.7)	134 (6.4) (10.3)	371 (17.8) (13.4)	2,086 (100.0) (9.5)
RSL	581 (31.4) (6.4)	251 (13.6) (11.8)	488 (26.4) (7.7)	39 (2.1) (8.4)	105 (5.7) (8.1)	386 (20.9) (13.9)	1,850 (100.0) (8.4)
Total	9,014 (41.0) (100.0)	2,131 (9.7) (100.0)	6,312 (28.7) (100.0)	460 (2.1) (100.0)	1,297 (5.9) (100.0)	2,775 (12.6) (100.0)	21,989 (100.0) (100.0)

Base: All Dwellings

Table 4.6 Type of boiler - Proportion of boiler type by household composition

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
couple under 60	1,771 (44.5) (20.1)	293 (7.4) (14.3)	1,242 (31.2) (20.5)	81 (2.0) (18.0)	242 (6.1) (19.7)	351 (8.8) (14.1)	3,979 (100.0) (18.9)
couple 60 or over	1,699 (48.2) (19.3)	368 (10.4) (18.0)	796 (22.6) (13.2)	101 (2.9) (22.6)	187 (5.3) (15.2)	374 (10.6) (15.0)	3,525 (100.0) (16.7)
couple with children	2,375 (46.4) (27.0)	404 (7.9) (19.7)	1,644 (32.2) (27.2)	139 (2.7) (30.9)	298 (5.8) (24.3)	255 (5.0) (10.2)	5,114 (100.0) (24.3)
lone parent with children	574 (37.9) (6.5)	173 (11.4) (8.4)	489 (32.2) (8.1)	22 (1.4) (4.9)	91 (6.0) (7.5)	167 (11.0) (6.7)	1,516 (100.0) (7.2)
large adult household	561 (38.8) (6.4)	158 (11.0) (7.7)	451 (31.2) (7.5)	37 (2.6) (8.3)	84 (5.9) (6.9)	152 (10.5) (6.1)	1,444 (100.0) (6.9)
one person under 60	773 (30.8) (8.8)	212 (8.4) (10.3)	797 (31.8) (13.2)	29 (1.2) (6.5)	164 (6.6) (13.4)	532 (21.2) (21.4)	2,507 (100.0) (11.9)
one person 60 or over	1,041 (35.1) (11.8)	438 (14.7) (21.4)	630 (21.2) (10.4)	39 (1.3) (8.8)	160 (5.4) (13.1)	662 (22.3) (26.5)	2,970 (100.0) (14.1)
Total	8,794 (41.8) (100.0)	2,045 (9.7) (100.0)	6,049 (28.7) (100.0)	448 (2.1) (100.0)	1,226 (5.8) (100.0)	2,492 (11.8) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 4.7 Type of boiler - Proportion of boiler type by the age of the household representative

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
16 - 29	521 (30.0) (5.9)	133 (7.7) (6.5)	650 (37.4) (10.7)	25 (1.5) (5.6)	124 (7.2) (10.1)	281 (16.2) (11.3)	1,736 (100.0) (8.2)
30 - 44	2,504 (39.8) (28.5)	512 (8.1) (25.1)	2,184 (34.7) (36.1)	136 (2.2) (30.3)	405 (6.4) (33.0)	554 (8.8) (22.2)	6,296 (100.0) (29.9)
45 - 64	3,585 (46.5) (40.8)	682 (8.8) (33.3)	2,092 (27.1) (34.6)	184 (2.4) (41.1)	427 (5.5) (34.8)	739 (9.6) (29.7)	7,709 (100.0) (36.6)
65 or over	2,183 (41.1) (24.8)	718 (13.5) (35.1)	1,123 (21.1) (18.6)	103 (1.9) (23.0)	271 (5.1) (22.1)	917 (17.3) (36.8)	5,314 (100.0) (25.2)
Total	8,794 (41.8) (100.0)	2,045 (9.7) (100.0)	6,049 (28.7) (100.0)	448 (2.1) (100.0)	1,226 (5.8) (100.0)	2,492 (11.8) (100.0)	21,055 (100.0) (100.0)

Base: All Dwellings

Table 4.8 Type of boiler - Proportion of boiler type by household income

	count(000s), (row%), (column%)						
	Standard boiler (floor or wall)	Back boiler (to fire or stove)	Combination boiler	Condensing boiler	Condensing- combination boiler	No boiler	Total
Q1: <£10k	1,323 (31.5) (15.1)	602 (14.3) (29.4)	1,105 (26.3) (18.3)	70 (1.7) (15.6)	227 (5.4) (18.5)	871 (20.7) (35.0)	4,198 (100.0) (19.9)
Q2: £10k-£15k	1,568 (37.3) (17.8)	506 (12.0) (24.7)	1,187 (28.2) (19.6)	60 (1.4) (13.4)	251 (6.0) (20.4)	635 (15.1) (25.5)	4,206 (100.0) (20.0)
Q3: £15k-£22k	1,687 (40.1) (19.2)	465 (11.0) (22.7)	1,308 (31.0) (21.6)	57 (1.4) (12.7)	227 (5.4) (18.5)	469 (11.1) (18.8)	4,211 (100.0) (20.0)
Q4: £22k-£33k	1,931 (45.8) (22.0)	301 (7.1) (14.7)	1,291 (30.6) (21.3)	96 (2.3) (21.5)	268 (6.4) (21.9)	329 (7.8) (13.2)	4,216 (100.0) (20.0)
Q5: >£33k	2,285 (54.1) (26.0)	173 (4.1) (8.4)	1,158 (27.4) (19.1)	165 (3.9) (36.8)	254 (6.0) (20.7)	188 (4.5) (7.5)	4,223 (100.0) (20.1)
Total	8,794 (41.8) (100.0)	2,045 (9.7) (100.0)	6,049 (28.7) (100.0)	448 (2.1) (100.0)	1,226 (5.8) (100.0)	2,492 (11.8) (100.0)	21,055 (100.0) (100.0)

Base: All Households