

SDR 204/2010

26 November 2010

## Living in Wales 2008: Energy Efficiency of Dwellings

The Living in Wales survey is a household survey for Wales commissioned by the Welsh Assembly Government. The survey comprised a household survey for each year from 2004 to 2008 with additional property surveys in 2004 and 2008. The Living in Wales property survey involved qualified surveyors visiting 2,700 addresses that had participated in the Living in Wales household survey.

This report provides analysis of the 2008 Living in Wales household and property data relating to the properties' energy performance and environmental impact. A dwelling is awarded two ratings: the SAP rating (also known as the Energy Efficiency rating) and the Environmental Impact (EI) rating.

The Standard Assessment Procedure (SAP) rating system is used to assess how much energy a dwelling consumes and how much carbon dioxide it emits, based on standardised occupancy conditions. The EI rating is based on the dwelling's impact on the environment in terms of CO<sub>2</sub> emissions associated with running the dwelling. Both ratings are divided into bands A to G, with band A being awarded to the best performing dwellings.

This information is used by the Welsh Assembly Government to help develop programmes to improve energy efficiency, tackle fuel poverty, and reduce climate change. It helps the Welsh Assembly Government to monitor progress in achieving the statutory target to eradicate fuel poverty by 2018 and also to monitor progress and activity that will help to reduce greenhouse gas emissions in Wales in line with the targets in the Climate Change Strategy for Wales. This information is also of interest to a wide range of organisations in Wales that help to tackle fuel poverty, reduce energy bills and deal with climate change. These organisations include National Energy Action, the Energy Saving Trust, Consumer Focus, WWF Cymru and Friends of the Earth.

### Key points show:

- The SAP rating for dwellings in Wales increased by 4 SAP points between 2004 and 2008. The 2008 average SAP rating for a home in Wales is 50 (band E).
- The 2008 average Environment Impact (EI) rating for a home in Wales is 46 (band E), which is an increase of 4 points from 2004.
- Local authority and housing association dwellings have higher SAP and EI ratings than the national average. Private rented dwellings consistently have the poorest ratings.
- The age of a dwelling is strongly related to its energy efficiency, with older dwellings having much lower SAP and EI ratings.

**Statistician:** Stephanie Howarth  
**Next Update:** Not a regular output

**Tel:** 029 2082 5055

**E-mail:** stats.housing@wales.gsi.gov.uk



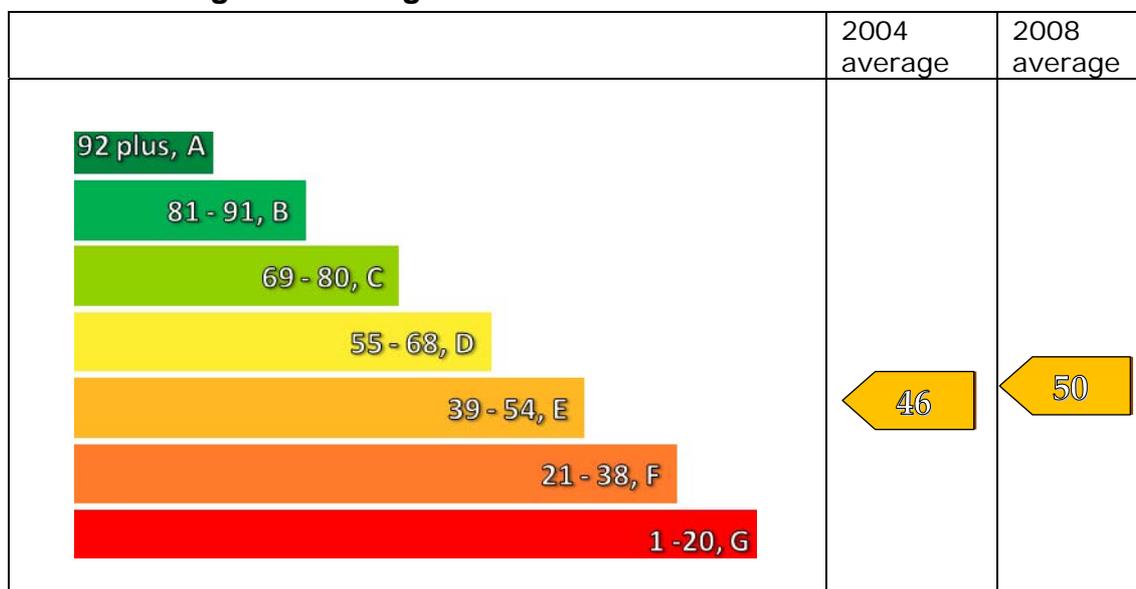
## Standard Assessment Procedure (SAP) Rating

The SAP rating is based on the energy costs that would be associated with running the dwelling. Standard running conditions and the gross floor area (m<sup>2</sup>) are taken into account, to ensure that dwellings of different sizes can be compared. The ratings are expressed on a scale between 1 and 100, where 100 represents no energy cost. In some cases a dwelling can achieve a rating of more than 100, but this is reserved for dwellings which export energy and make a net profit. The 'SAP 2005' methodology is used in this publication.

SAP ratings are divided into bands from A to G. The highest values (i.e. the highest levels of energy efficiency) are assigned to band A and the lowest values are assigned to band G. The bandings are shown in the table below. The same bandings are used for EI ratings.

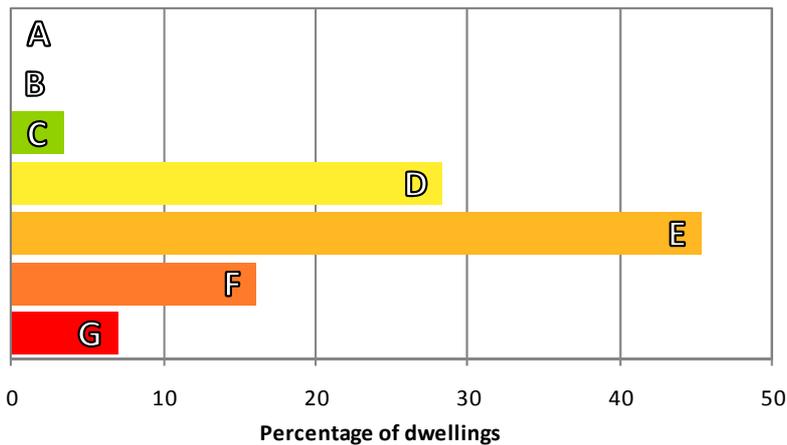
SAP or EI band	SAP or EI rating
A	92+
B	81-91
C	69-80
D	55-68
E	39-54
F	21-38
G	1-20

**Chart 1: Average SAP rating**

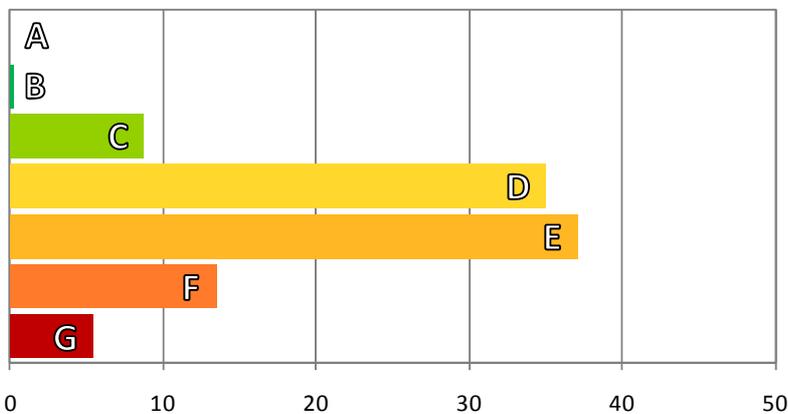


Overall, the average SAP rating increased by 4 SAP points between 2004 and 2008 from 46 to 50. In 2008, the most common SAP rating band was band E with 37 percent of dwellings in this band. Bands C and D showed the largest increase, by 5 and 7 percentage points respectively. In 2008 there were no dwellings in Band A and 0.2 per cent of dwellings were in band B. In 2004, there were no dwellings in bands A or B.

**Chart 2: Percentage of dwellings by SAP band, 2004**



**Chart 3: Percentage of dwellings by SAP band, 2008**



**Table 1: Average SAP rating by Tenure**

	Average SAP rating	
	2004	2008
<b>Tenure:</b>		
Housing Association	60 (D)	63 (D)
Local authority	48 (E)	58 (D)
Owner-occupied	46 (E)	49 (E)
Private rented	43 (E)	46 (E)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Table 1 shows that housing association dwellings had the highest average SAP rating (band D). The dwellings that were owner-occupied or privately rented had the lowest SAP ratings (band E). Local authority dwellings showed the biggest increase in SAP ratings between 2004 and 2008 of 10 SAP points. Each other tenure showed an increase of 3 SAP points.

**Table 2: Average SAP rating by dwelling type**

	Average SAP rating	
	2004	2008
<b>Dwelling type:</b>		
Flats	53 (E)	62 (D)
Mid terrace	52 (E)	54 (E)
Semi-detached and End terrace	45 (E)	50 (E)
Detached	42 (E)	45 (E)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Flats had the highest SAP rating, increasing by 9 SAP points between 2004 and 2008, to an average rating of 62. Detached houses had the lowest average SAP rating in both years.

**Table 3: Average SAP rating by Date of construction**

	Average SAP rating	
	2004	2008
<b>Date of construction:</b>		
Pre 1850	28 (F)	31 (F)
1850 - 1899	41 (E)	40 (E)
1890 - 1918	46 (E)	46 (E)
1919 - 1944	43 (E)	47 (E)
1945 - 1964	45 (E)	52 (E)
1965 - 1974	47 (E)	53 (E)
1975 - 1980	50 (E)	55 (D)
1981 - 1990	55 (D)	57 (D)
Post 1990	61 (D)	64 (D)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Older dwellings were more likely to have a lower SAP rating than newer dwellings. Dwellings built between 1850 and 1899 showed a very slight decrease in their SAP rating between 2004 and 2008. Most other dwellings showed an overall increase in their average SAP rating. The highest increase of 7 SAP points was for dwellings constructed between 1945 and 1964. For houses built between 1975 and 1980, their average SAP rating increased by 5 SAP points. This changed their band from an E to a D rating.

**Table 4: Average SAP rating by nature of local area**

	<b>Average SAP rating</b>	
	<b>2004</b>	<b>2008</b>
<b>Nature of local area:</b>		
Urban	49 (E)	54 (E)
Rural	34 (F)	38 (F)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Dwellings in urban areas had higher average SAP ratings than rural areas, with an average rating of 54 in 2008. Dwellings in rural areas had lower average SAP ratings and showed a smaller improvement between 2004 and 2008 than dwellings in urban areas.

**Table 5: Average SAP rating by main heating fuel**

	<b>Average SAP rating</b>	
	<b>2004</b>	<b>2008</b>
<b>Heating fuel:</b>		
Gas	50 (E)	54 (E)
Oil	37 (F)	39 (E)
Electricity	32 (F)	34 (F)
Solid fuel	20 (G)	22 (F)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,192,600 (2004) and 1,264,800 (2008)

Source: Living in Wales Survey 2004 & 2008

Table 5 shows that of those that had a primary heating source, dwellings heated by gas had the highest average SAP rating of 54, an increase of 4 SAP points from 2004. Dwellings heated by solid fuel had the lowest average SAP rating in 2004 and 2008.

The dwellings which had a mains supply gas had a higher average SAP rating than those without. This does not take into account whether dwellings on the mains gas network used gas as their main heating fuel. In 2008, dwellings with a mains supply gas had an average SAP rating of 54 compared to those without, which had an average rating of 31.

**Table 6: Average SAP rating by type of boiler**

	Average SAP rating	
	2004	2008
<b>Type of boiler:</b>		
Condensing combi	54 (E)	59 (D)
Condensing	46 (E)	57 (D)
Combination	52 (E)	52 (E)
Back boiler	45 (E)	49 (E)
Standard	47 (E)	47 (E)
No boiler	32 (F)	31 (F)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,194,000 (2004) and 1,265,900 (2008)

Source: Living in Wales Survey 2004 & 2008

Of the dwellings that had a primary heating source present, dwellings with a condensing combi boiler had the highest average SAP rating of 59. Dwellings with a combination boiler, standard boiler or no boiler showed either no change or a very slight decrease in average SAP ratings between 2004 and 2008.

**Table 7: Average SAP rating by main type of heating**

	Average SAP rating	
	2004	2008
<b>Type of heating:</b>		
Central heating (wet radiators)	48 (E)	52 (E)
Storage heaters	35 (F)	36 (F)
Room heaters	23 (F)	23 (F)
<b>Total</b>	<b>46 (E)</b>	<b>50 (E)</b>

Weighted total: 1,185,200 (2004) and 1,264,200 (2008)

Source: Living in Wales Survey 2004 & 2008

Of the dwellings that had a primary heating source present, dwellings with central heating had the highest overall average SAP rating of 52 (band E). Dwellings with room heaters had the lowest average SAP rating of 23 (band F).

**Table 8: Average SAP rating by age of household reference person (HRP)**

	Average SAP rating	
	2004	2008
<b>Age of HRP</b>		
16-64	47 (E)	51 (E)
65 and over	44 (E)	49 (E)
<b>Total</b>	46 (E)	50 (E)

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

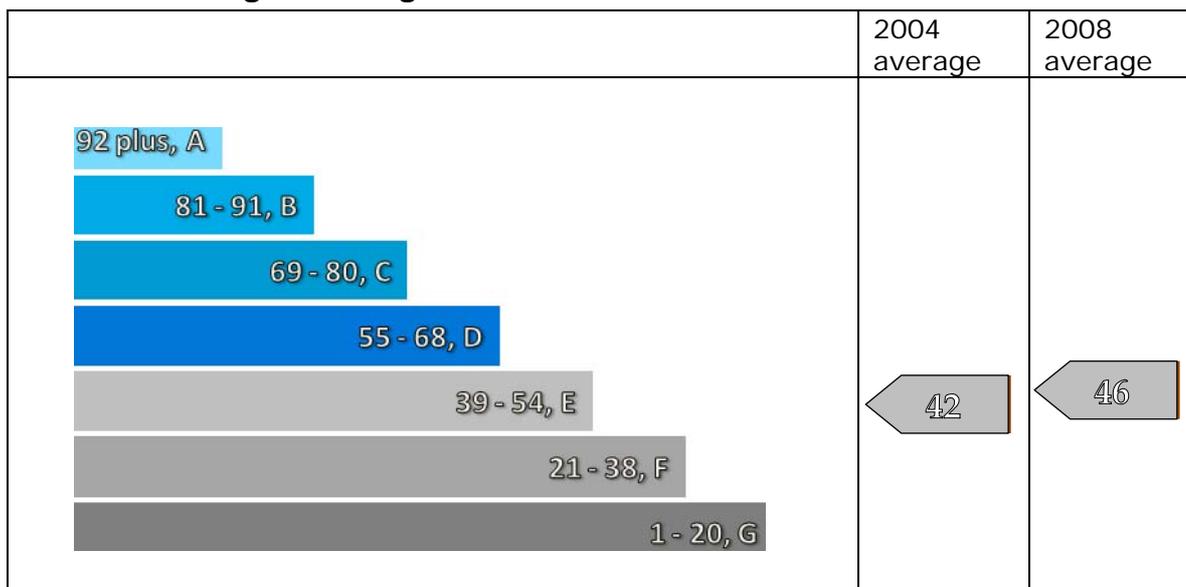
Table 8 shows that dwellings occupied by an older household reference person (HRP) have a slightly lower average SAP rating than dwellings with a younger household reference person.

There appeared to be no difference between dwellings that were occupied by working or workless households. There was also no apparent difference in SAP ratings for dwellings that were occupied by vulnerable households (i.e. households containing children, elderly people or people who are long term sick or disabled).

## Environmental Impact (EI) rating

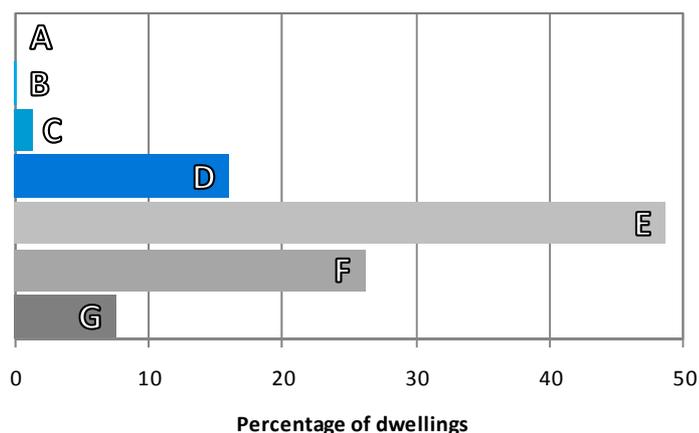
The EI rating is based on the dwelling's impact on the environment in terms of CO<sub>2</sub> emissions associated with running the dwelling. Standard running conditions and the gross floor area (m<sup>2</sup>) are taken into account to ensure that dwellings of different sizes can be compared. The EI rating is expressed on a scale of 1 to 100, where 100 represents a carbon neutral dwelling. EI ratings are divided into bands from A to G using the same bands as SAP ratings (see page 2 for more details).

**Chart 5: Average EI rating**

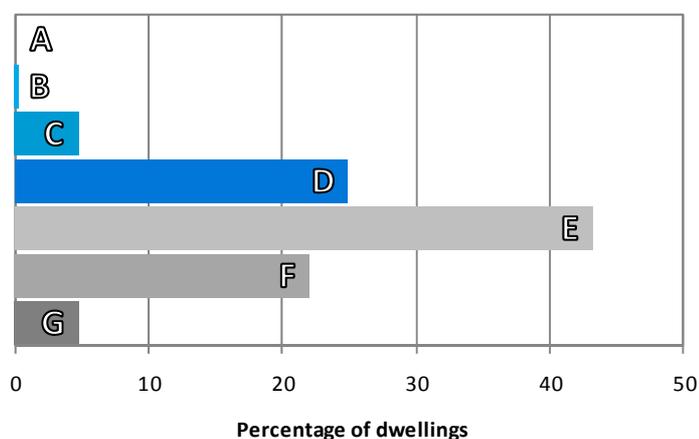


The average EI rating of all first homes in Wales for 2008 was 46 (band E). Band E was the most common rating in 2008 with 43 per cent of dwellings in this band. No dwelling achieved the A rating, and only 0.2 per cent achieved a B rating. Bands C and D showed the largest increase, of 3 and 9 percentage points respectively between 2004 and 2008.

**Chart 6: Percentage of dwellings by EI rating bands, 2004**



**Chart 7: Percentage of dwellings by EI rating bands, 2008**



**Table 9: Average EI rating by Tenure**

	Average EI rating	
	2004	2008
<b>Tenure:</b>		
Housing Association	55 (D)	58 (D)
Local authority	43 (E)	53 (E)
Private rented	41 (E)	44 (E)
Owner-occupied	41 (E)	44 (E)
<b>Total</b>	<b>42 (E)</b>	<b>46 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Housing association dwellings had the highest average EI rating (band D). Dwellings that were privately rented or owner occupied had the lowest rating of 44 in 2008. Local authority dwellings showed the largest increase in average EI rating between 2004 and 2008, increasing by 10 EI points. The other tenures increased by three EI points each.

**Table 10: Average EI rating by dwelling type**

	Average EI rating			
	2004		2008	
<b>Dwelling type:</b>				
Flats	50	(E)	59	(D)
Mid terrace	48	(E)	49	(E)
Semi-detached and End terrace	41	(E)	46	(E)
Detached	38	(F)	42	(E)
<b>Total</b>	<b>42</b>	<b>(E)</b>	<b>46</b>	<b>(E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Flats had the highest EI rating, increasing by nine EI points between 2004 and 2008, to 59. Detached dwellings showed the lowest EI rating, although the average rating for detached dwellings moved from a band F to a band E between 2004 and 2008.

**Table 11: Average EI rating by Date of construction**

	Average EI rating			
	2004		2008	
<b>Date of construction:</b>				
Pre 1850	28	(F)	30	(F)
1850 - 1899	38	(F)	37	(F)
1890 - 1918	42	(E)	42	(E)
1919 - 1944	38	(F)	43	(E)
1945 - 1964	39	(E)	47	(E)
1965 - 1974	42	(E)	48	(E)
1975 - 1980	45	(E)	51	(E)
1981 - 1990	50	(E)	53	(E)
Post 1990	58	(D)	61	(D)
<b>Total</b>	<b>42</b>	<b>(E)</b>	<b>46</b>	<b>(E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Older dwellings had a lower average EI rating than newer dwellings. Dwellings that were built post 1990 had the highest average EI rating of 61 in 2008. Dwellings built between 1850 and 1899 showed a very slight decrease in average EI rating between 2004 and 2008.

**Table 12: Average EI rating by nature of local area**

	Average EI rating	
	2004	2008
<b>Nature of local area:</b>		
Urban	45 (E)	49 (E)
Rural	32 (F)	36 (F)
<b>Total</b>	<b>42 (F)</b>	<b>46 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Dwellings in urban areas had higher overall average EI ratings with an average rating of 49 (band E). This was an increase of four EI points between 2004 and 2008. Dwellings in rural areas had lower average EI ratings and were in a band F. Rural dwellings also showed a four EI point increase between 2004 and 2008.

**Table 13: Average EI rating by main heating fuel**

	Average EI rating	
	2004	2008
<b>Heating fuel:</b>		
Gas	46 (E)	50 (E)
Electricity	31 (F)	33 (F)
Oil	30 (F)	32 (F)
Solid fuel	16 (G)	28 (F)
<b>Total</b>	<b>42 (E)</b>	<b>46 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Of the dwellings that had a primary heating source present, dwellings that used gas heating had the highest average EI rating, with a rating of 50. Dwellings that used solid fuel had the lowest average EI rating (28), but showed the largest increase in average EI rating between 2004 and 2008.

**Table 14: Average EI rating by boiler type**

	Average EI rating			
	2004		2008	
<b>Type of boiler:</b>				
Condensing combi	50	(E)	56	(D)
Condensing	44	(E)	53	(E)
Combination	47	(E)	48	(E)
Back boiler	40	(E)	44	(E)
Standard	42	(E)	43	(E)
No boiler	32	(F)	34	(F)
<b>Total</b>	<b>42</b>	<b>(E)</b>	<b>46</b>	<b>(E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Of the dwellings that had a primary heating source present, dwellings with condensing combi boilers had the highest average EI rating at 56 (band D). Dwellings with condensing boilers had the largest increase in average EI rating, increasing by nine EI points. Dwellings with no boiler had the lowest average EI rating, with an average rating of 34 (band F).

**Table 15: Average EI rating by main type of heating**

	Average EI rating			
	2004		2008	
<b>Type of heating:</b>				
Central heating (wet radiators)	44	(E)	47	(E)
Room heaters	26	(F)	34	(F)
Storage heaters	32	(F)	33	(F)
<b>Total</b>	<b>42</b>	<b>(E)</b>	<b>46</b>	<b>(E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Of the dwellings that had a primary heating source present, dwellings that had a central heating had the highest average EI rating of 47. Dwellings with room heaters showed the biggest increase between 2004 and 2008, with an increase of 8 EI points to 34.

**Table 16: Average EI rating by age of household reference person (HRP)**

	Average EI rating	
	2004	2008
<b>Age of HRP</b>		
16-64	43 (E)	47 (E)
65 and over	40 (E)	45 (E)
<b>Total</b>	<b>42 (E)</b>	<b>46 (E)</b>

Weighted total: 1,209,100 (2004) and 1,268,400 (2008)

Source: Living in Wales Survey 2004 & 2008

Table 16 shows that households with an older household reference person had slightly lower average EI ratings.

There appeared to be no difference in EI ratings between dwellings that were occupied by working or workless households. There was also no apparent difference in EI ratings for dwellings that were occupied by vulnerable households (i.e. households containing children, elderly people or those who are long term sick or disabled).

## Quality Information

### Methodology

- The 2008 Living in Wales Property Survey continues a series of Welsh House Condition Surveys, last conducted in 1998 and 2004. The survey provides information to the Welsh Assembly Government for the development and monitoring of housing policies directed at the repair, improvement and energy efficiency of the housing stock.
- The survey was commissioned by the Welsh Assembly Government, managed by the Local Government Data Unit ~ Wales and conducted by Ipsos MORI.
- The sample for the Property Survey is taken from the 2008 Living in Wales Household Survey. The Household Survey was used to assess the condition of the dwelling and determine its inclusion in the Property Survey sample. The householder must also give consent. The final sample was 2,741 dwellings stratified by condition, age of the dwelling and tenure. The sample only contains occupied first homes. Further details of the survey are available in the technical report <http://wales.gov.uk/about/aboutresearch/social/ocsropage/living-wales/technicalreports/?lang=en>
- The data from the 2008 Household Survey was linked to the data from the 2008 property survey to provide information on the dwelling and its occupants.
- The methodology for calculating SAP and EI ratings can be found on the BRE website: [www.bre.co.uk](http://www.bre.co.uk).

### Comparability

- There are no known reasons why the 2004 and 2008 Living in Wales Surveys should not be comparable. The surveys were designed to ensure comparability where possible. If this is not the case it is noted in the text of the report.
- The Living in Wales Survey methodology differs from other house condition survey methodologies in the UK and care should be taken when making comparisons.

### Accuracy

- The overall response rate for the Property Survey was 71.6 per cent. Response rates varied by local authority from 60 per cent to 80 per cent. The figures are designed to be reported at a Wales level.
- The Living in Wales Survey is a sample survey and is subject to sampling variability.
- Figures reported in this publication have been rounded to the nearest 1,000 grossed responses and percentages rounded to the nearest whole number.
- Where comparisons have been made with 2004 data the figures may have different accuracy associated with them due to sampling.

### Timeliness

- The 2008 Living in Wales Household Survey was conducted between January and August 2008. The 2008 Living in Wales Property Survey was conducted between September and December 2008.
- The Living in Wales Survey was conducted in 2004 and similar methodology was used in previous House Condition Surveys in 1998 and 1986.
- The Living in Wales Survey has now been replaced by the National Survey for Wales for the household element. No further house condition surveys are planned.
- The Living in Wales Property Survey data is collected via paper forms and scanned to form an electronic database. The processes for checking the data are more complicated than for the Household Survey which is collected electronically. The Property Survey data is used in various post-survey modelling processes to obtain energy efficiency ratings and repair costs. These processes all contribute to a longer analysis period and therefore a delay in publication compared to the Household Survey results.

## Terms and definitions

**Household** – is defined as one person living alone, or a group of people (not necessarily related) living at the same address with common housekeeping – that is, sharing either a living room or sitting room or at least one meal a day.

**HRP** – Household Reference Person is defined as the person in whose name the home is owned or rented. If it is jointly owned or rented the HRP is the person who earns the most. If there are equal incomes the HRP is the eldest.

**SAP** – Standard Assessment Procedure (SAP) ratings assess how much energy a dwelling consumes and how much carbon dioxide will be emitted, based on standardised occupancy conditions. Standard running conditions and the gross floor area (m<sup>2</sup>) are taken into account, to ensure that dwellings of different sizes can be compared. The values are expressed on a scale between 1 and 100, where 100 represents no energy cost. In some cases it can be more than 100, but this is reserved for dwellings which export energy and make a net profit

**EI** - The Environmental Impact (EI) rating is based on a dwelling's impact on the environment, in terms of CO<sub>2</sub> emissions associated with running the dwelling. Standard running conditions and the gross floor area (m<sup>2</sup>) are taken into account, to ensure that dwellings of different sizes can be compared. The EI rating is expressed on a scale of 1 to 100, where 100 represents a carbon neutral dwelling

**Urban/Rural** – As defined by ONS morphology. <http://www.ons.gov.uk/about-statistics/geography/products/area-classifications/rural-urban-definition-and-la-classification/rural-urban-definition/index.html>. Urban combines the urban and town categories and rural combines the villages and isolated dwellings and hamlets.

## Further information

- Living in Wales Household Survey 2008 results  
<http://wales.gov.uk/topics/statistics/publications/livinginwales08/?lang=en>
- Living in Wales Household Survey 2008 technical report  
<http://wales.gov.uk/about/aboutresearch/social/ocsropage/living-wales/technicalreports/?lang=en>
- Living in Wales Property Survey 2008 technical report  
<http://wales.gov.uk/about/aboutresearch/social/ocsropage/living-wales/technicalreports/?lang=en>
- Further information is available on previous surveys from the Living in Wales web pages:  
<http://www.wales.gov.uk/livinginwalesurvey>

If you require any further information about using the data collected by the Living in Wales survey, then please contact the Welsh Assembly Government. The contact point for requests for statistics on the Living in Wales survey is:

Darren Hatton  
Welsh Assembly Government  
Room 3.13, CP1  
Cathays Park  
Cardiff  
CF10 3NQ

Telephone number: 029 2082 3035  
Email: [darren.hatton@wales.gsi.gov.uk](mailto:darren.hatton@wales.gsi.gov.uk)