

# Explanation of average energy use tables.

**27 August 2010.**

## Introduction.

This document explains the methodology behind the tables of average gas and electricity consumption on the Carbon Retirement website. Unless otherwise referenced, all figures are taken from the Act on CO2 methodology.<sup>1</sup>

The purpose of the tables is to provide an example of typical home energy use. There are three potential combinations for home energy use:

1. Homes that use only electricity
2. Homes that use electricity for everything except central heating
3. Homes that use electricity for everything except central heating and water heating

The electricity table uses the following numbers in the calculations:

Electricity for...	1. Homes that use only electricity	2. Homes that use electricity for everything except central heating	3. Homes that use electricity for everything except central heating and water heating
...appliances	Yes	Yes	Yes
...space heating	Yes	No	No
...water heating	Yes	Yes	No

The gas table uses the following numbers in the calculations:

Gas for...	1. Only central heating	2. Only water heating	3. Both
...space heating	Yes	No	Yes
...water heating	No	Yes	Yes

## Energy consumption for space (central) heating.

In order to get an average energy use per number of bedrooms for space heating, we have taken the straight average (i.e. not weighted by relative numbers of different property types or age) of:

- a) all types of property (flat, mid-terraced house, end-terraced house, semi-detached bungalow, detached bungalow, semi-detached house, detached house and maisonette) and
- b) all ages of property (pre 1930, 1930-1995, post 1995).<sup>2</sup>

<sup>1</sup> Available at <http://actonco2.direct.gov.uk/dms/091123-Act-on-CO2-calculator-v2-methodology-FINAL.PDF>

The average heating system efficiency factor of 72% was used for gas boilers and 100% for electric systems.<sup>3</sup> This exercise was completed for both gas use and electricity use.

## Energy consumption for water heating.

In order to calculate the average energy consumption per number of bedrooms for water heating we completed a similar exercise. For this calculation we also made an assumption about the number of people living in each property, as the water factors are per person rather than per bedroom.<sup>4</sup>

For a 1 bedroom property we assumed it would be occupied by 1-2 people (and therefore used an average of the water factors for 1 person and 2 people), for a 2 bedroom property we assumed it would be occupied by 2-4 people (and therefore used an average of the water factors for 2 people, 3 people and 4 people), for a 3 bedroom property we assumed 3-6 people, 4 bedroom property 4-8 people, 5 bedroom property 5-10 people, and a 6+ bedroom property 6-20 people.

In accordance with the Act on CO2 methodology we then multiplied this by the average energy use per fuel type (gas or electricity)<sup>5</sup> and the heating system factors of 72% for gas and 100% for electric systems.<sup>3</sup>

## Energy consumption for appliances.

We have assumed that appliances are always powered by electricity. To work out the electricity use we used the national average figure for appliances from the Act on CO2 methodology and divided this by the emissions factor for electricity.<sup>6</sup>

As with water heating, the data for appliance use is provided on a per person, rather than a per bedroom basis. Hence assumptions regarding the number of people property have been used in this calculation as with the water calculation above. However, the data provided stops at '5+' people. Hence for a 3 bedroom property we used the average of the appliance energy use for 3 people, 4 people and 5+ people; for a 4 bedroom property we used the average of the appliance energy use for 4 people and 5+ people; for a 5 bedroom property we used the appliance energy use for 5+ people and for a 6+ bedroom property we used the appliance energy use for 5+ people.

All figures are presented in kWh and rounded to the nearest 100.

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<sup>2</sup> Figures sourced from Table A3: Baseline useful energy demand (in kWh) for space heating by heating fuel, property type, number of bedrooms and age category

<sup>3</sup> Figures sourced from Table A2: Home heating fuels, systems and efficiencies

<sup>4</sup> Figures sourced from Table A4: Water heating factor per person

<sup>5</sup> Figures sourced from Table A5: Baseline useful energy demand factors per person for water heating by heating fuel, property type and age category

<sup>6</sup> Figures sourced from [Table 1](#): Fuel Property Conversion Factors