

European Energy Efficiency trends – Household energy consumption

Introduction

This article provides an overview of the UK's energy efficiency performance compared with other EU countries¹, drawing on energy efficiency indicators from the ODYSSEE database. The full ODYSSEE database can be found on their website, at: www.odyssee-indicators.org.

The main objectives of the ODYSSEE database include:

- Monitoring energy efficiency progress (and CO₂ reduction).
- Comparing and evaluating the differences between countries in their relative energy efficiency performances and to identify potentials for improvement.
- Understanding energy demand trends.
- Measuring the contribution of innovative energy efficiency and renewable technologies to the Lisbon targets to make Europe more competitive.

This article focuses on the household energy efficiency of the UK in 2008 and changes since 2000, making comparisons with other EU member countries. Some figures for the UK included in this article have been revised since data were submitted to ODYSSEE in September 2010 and will be included shortly in the database.

Data analysis

The indicator used in this article to compare the household energy efficiency levels of the UK with the other EU members is energy consumption per permanently occupied dwelling, expressed in kWh/dw. The indicator was calculated from official statistical sources, as a direct ratio between household energy consumption and the number of dwellings. The data are presented for all EU27 member countries. Adjustments have been made to scale the results to the average EU climate. This enables better comparisons to be made between countries.

When analysing the energy consumption per dwelling indicator, it is important to note that this indicator includes all energy consumed by the household and not just energy used for heating but excluding energy used for transport. However, it does not only reflect energy efficiency changes but can be affected by a number of behavioural and technical factors, such as the increase in household ownership of appliances, the intensity of their use and switching between fuels with different end-use efficiencies.

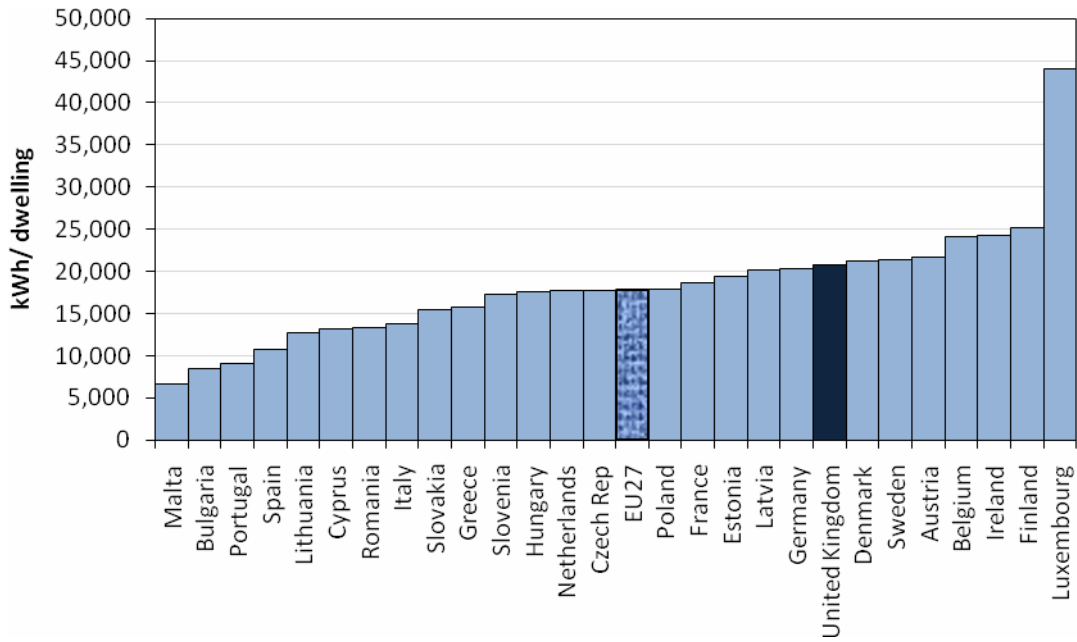
Chart 1 presents the energy consumption per dwelling in 2008 for all EU27 countries². The countries were ranked in order of increasing energy consumption per dwelling. The UK was in 21st position, consuming more energy per dwelling than France and Germany but less than Denmark and Sweden.

The average consumption per dwelling in the United Kingdom was 20,721 kWh/dw, 16 per cent higher than the EU27 average of 17,793 kWh/dw. The lowest consumption was 6,629 kWh/dw observed in Malta, while the greatest energy use was reported in Luxembourg at 44,078 kWh/dw, almost 2.5 times the EU27 average.

¹ The ODYSSEE data also contains data for Croatia and Norway but this article only compares data for the 27 EU Member States.

² 2008 data for Estonia and Lithuania were not available, so the 2007 figures were used.

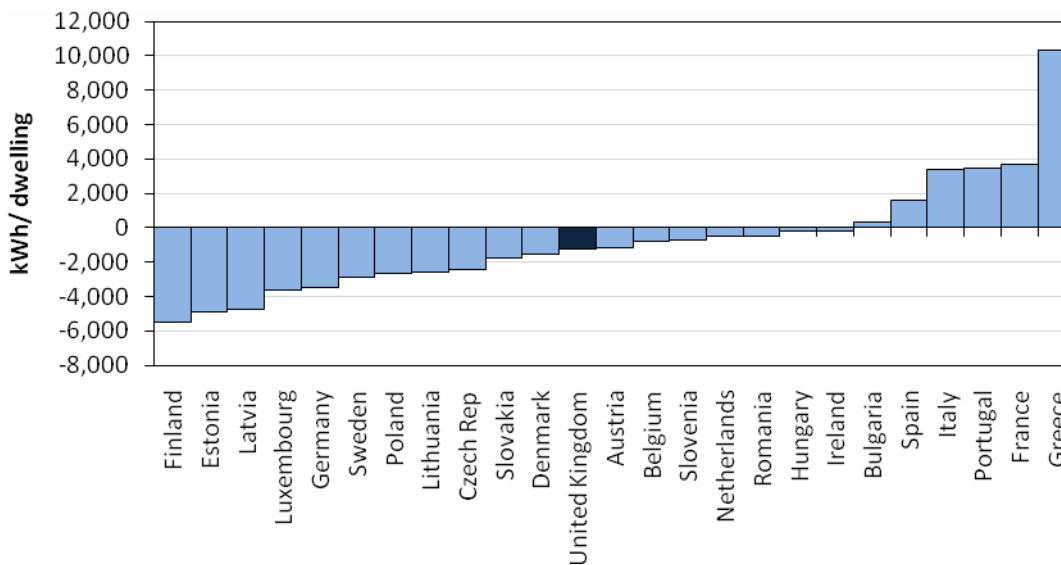
Chart 1. Household energy efficiency: Consumption per dwelling 2008



Not surprisingly chart 1 shows that many of the countries with low consumption per dwelling are those with warmer climates but there are other key factors. ODYSSEE also produces indicators that are scaled to the average European climate which enables fairer comparisons to be made across EU Member States.

Chart 2 below shows the differences between normal climate and average EU climate estimates of household energy consumption per dwelling in 2008. The figures indicate the correction factor made to the raw consumption per dwelling figures reported by individual countries. The EU27 figure is by definition zero. This calculation takes into account only the energy use for space heating.

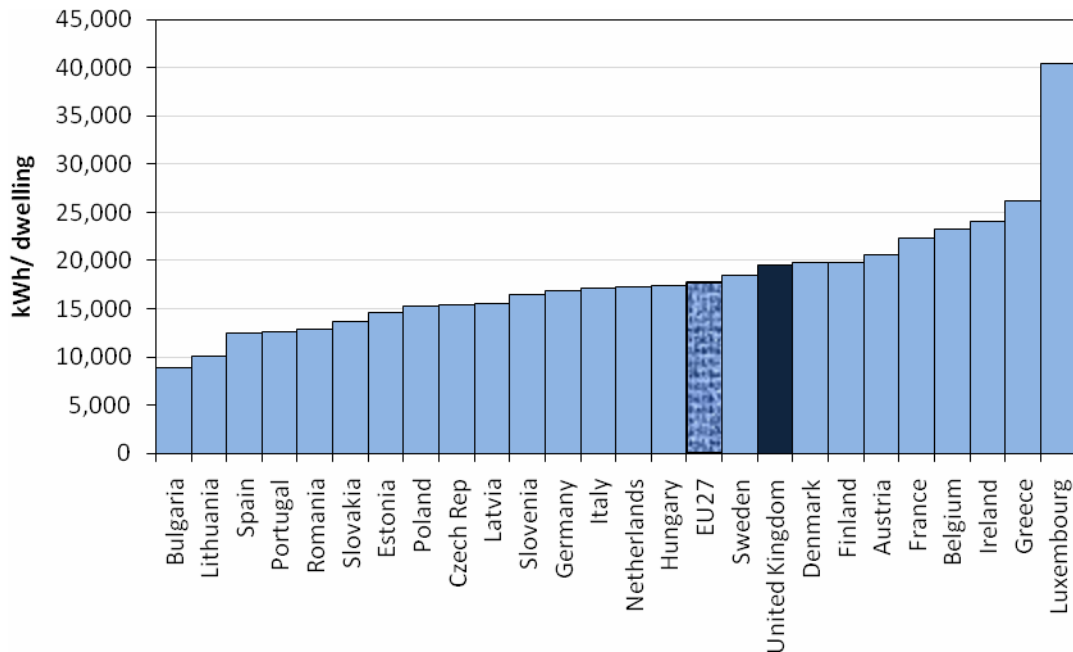
Chart 2. Difference in household energy consumption per dwelling between normal climate and average EU average climate by country for space heating



Excluding Cyprus and Malta where climate corrected figures are not available³, 19 of the remaining 25 countries have a negative impact from the climatic correction. These are the countries where heating requirements are higher due to lower winter external temperatures. The UK has the 12th largest climate correction reduction of -1,239 kWh/dw (6 per cent).

Chart 3 presents the total energy consumption per dwelling in 2008 on a climate corrected basis for all EU27 countries⁴, excluding Cyprus and Malta.

Chart 3. Household energy efficiency: Consumption per dwelling 2008 - climate adjusted



The order of the countries in chart 3 is highly correlated with the GDP per capita of the country⁵. The less affluent countries have lower household energy consumption on a climate corrected basis. Out of the 11 countries with lowest consumption per household, 10 of these have GDP per capita in 2008 below 20,000€. The EU27 average was over 25,000€.

On a climate corrected basis the UK ranking improves by one position to 18th position after recognising that Cyprus and Malta are excluded from the chart. This remains higher than the EU27 average. In addition, when using this measure, the UK has lower consumption per dwelling than France and Greece. It should be noted that Sweden has lower consumption per dwelling than the UK on a climate corrected basis.

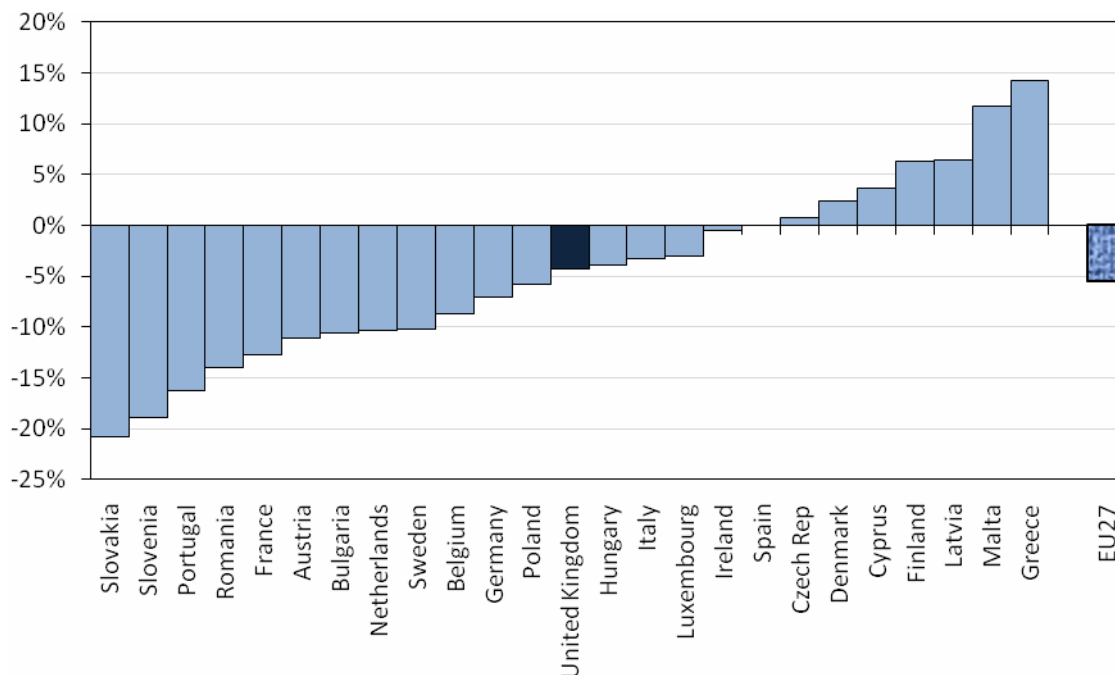
Chart 4 shows the percentage change in household energy consumption per dwelling between 2000 and 2008. A decrease in energy consumption per dwelling implies an increase in energy efficiency. These figures are adjusted for climate changes within the country and against the EU27 average.

³ Cyprus and Malta do not have climate adjusted data as their heating demand is so small the adjustment is not meaningful.

⁴ Data for Estonia and Lithuania were not available, so the 2007 figures were used.

⁵ <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>

Chart 4⁶. Changes in household energy consumption per dwelling between 2000 and 2008 (EU average adjusted)



The data suggest that the greatest energy efficiency improvements were made in Slovakia, where the energy consumption per dwelling decreased by 21 per cent (3,605 kWh/dw). The overall UK energy efficiency in the household sector reduced by 4 per cent since 2000 levels. The EU27 average decreased by 6 per cent over the same period. The energy intensity was unchanged in Spain and increased in seven countries. Of these, four are countries who have joined the EU since 2004. The greatest increase of 3,256 kWh/dw (14 per cent) was observed in Greece.

Conclusion

On a climate corrected basis the UK is a higher consumer of energy per dwelling than the EU27 average with two-thirds of countries having lower consumption per household in 2008. Since 2000 the UK has reduced energy consumption per dwelling by 4 per cent which places it in the top half of EU27 Member States but below neighbouring countries including France, Netherlands and Sweden where consumption reduced by at least 10 per cent over that period.

Anna Nikiel
 Energy Statistics
 Tel: 0300 068 5037
 E-mail: Anna.Nikiel@decc.gsi.gov.uk

Stephen Oxley
 Energy Statistics
 Tel: 0300 068 5025
 E-mail: Stephen.Oxley@decc.gsi.gov.uk

⁶ Data for Estonia and Lithuania were not available, so have been excluded. Cyprus and Malta are included by using non climate adjusted data.