The effect of the cold 2012/13 winter on energy bills

Introduction

DECC publishes data in its Quarterly Energy Prices (QEP) publication[1] on annual gas and electricity bills, based on standard consumption assumptions[2]. These fixed assumptions mean that these published bills do not reflect the effects of year on year changes in energy consumption due to weather fluctuations. The bills also represent an average bill for the whole year, with no estimate made of bills specifically for the winter period.

This article focuses on gas and electricity bills for the winter of 2011/12 and the winter of 2012/13. The winter period is based on quarter 4 and quarter 1 of the respective years, i.e. the October – March period, because gas consumption data is collected on a quarterly basis. Therefore it is not possible to calculate bills for a more precise definition of winter, such as the December – February period.

The winter of 2012/13 was particularly cold compared with previous years, especially the relatively mild winter of 2011/12. This article looks at the extent to which this cold weather affected domestic energy consumption, and subsequently the energy bills faced by households. It considers the differences in bills between the two winters, and the relative contributions of energy consumption and energy prices to these differences.

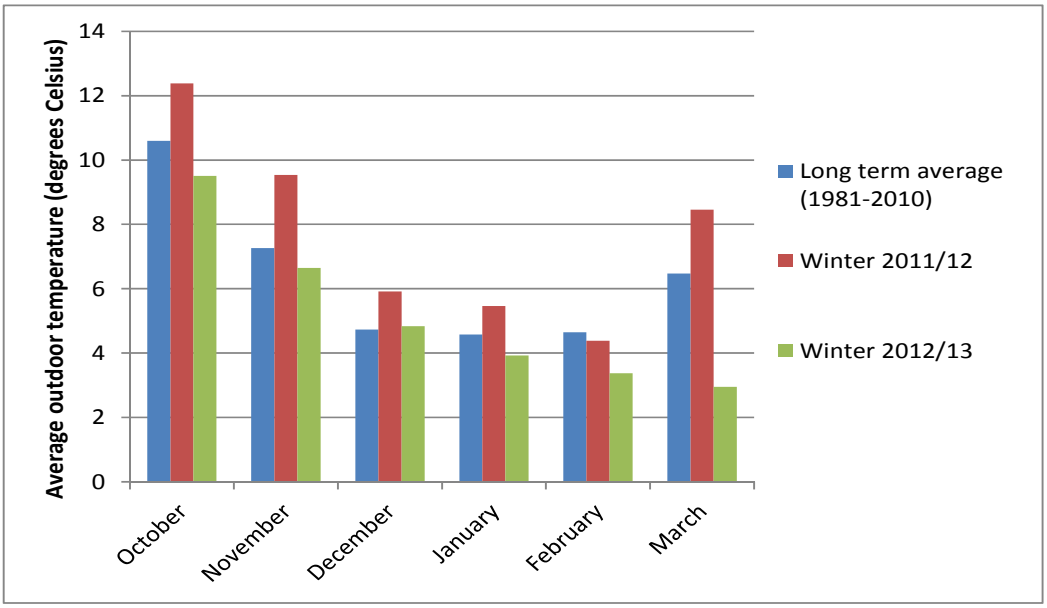
Weather in winter 2011/12 compared with 2012/13

As chart 1 shows, winter 2012/13 saw average outdoor temperatures[3] being lower in every month than in 2011/12. This was particularly noticeable in March, where average outdoor temperatures were lower by 5.5 degrees Celsius. It is worth noting, however, that the winter of 2011/12 was milder than the long term average of winter temperatures from 1981-2010. So the difference between the winters of 2011/12 and 2012/13 should be considered as the difference between a relatively cold winter and a relatively mild one, rather than the difference between a relatively cold winter and a typical one. On average, the winter of 2012/13 was colder than a year earlier by 2.5 degrees per day.

In addition to the trend in outdoor temperatures, the number of heating degree days[4] was also far greater in the winter of 2012/13 than 2011/12; there was an increase of 31 per cent in the number of heating degree days between the two years, from 47.2 in 2011/12 to 61.7 in 2012/13.

[1] Published online at www.gov.uk/government/statistical-data-sets/annual-domestic-energy-price-statistics
[2] DECC's standard annual consumption figures are: 18,000kWh for gas, 3,300kWh for standard electricity and 6,600kWh for Economy 7 electricity.
[3] Energy Trends, table 7.1: www.gov.uk/government/uploads/system/uploads/attachment_data/file/203607/et7_1.xls
[4] Heating Degree Days (HDDs) are used to reflect how weather influences the energy used to heat homes. They are calculated relative to a base temperature (DECC use 15.5°C), so if a day has an average (of the maximum and minimum) temperature of 10°C, the HDD for that day will be 5.5. If the daily average temperature exceeds the base temperature, the HDD for that day will be 0. The HDDs are summed for each month and published in Table 7.1 of Energy Trends.

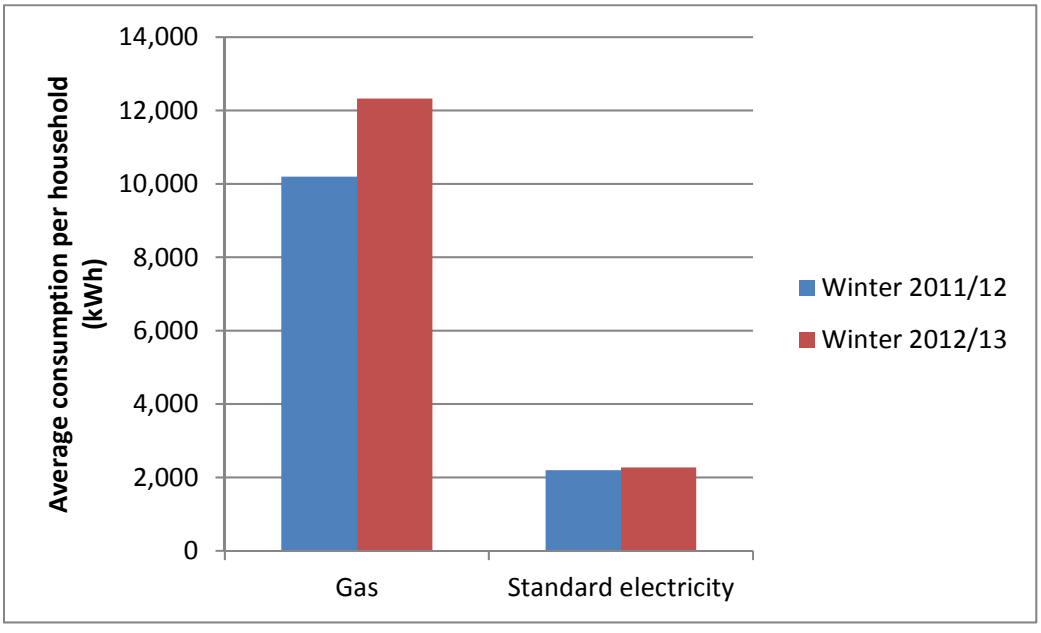
Chart 1: Average outdoor temperatures, winter 2011/12 and winter 2012/13



Energy consumption in winter 2011/12 compared with winter 2012/13[5]

Over time, the amount of energy consumed by households tends to closely reflect weather patterns. This is particularly true for gas, as this is the fuel used by most households for space heating. Chart 2 shows that the average gas consumption per household (of those that use gas) was considerably higher in the colder winter of 2012/13 than the milder winter of 2011/12. Standard electricity (excluding time of use tariffs), on the other hand, which is seldom used for heating, only saw slightly increased consumption in this period.

Chart 2: Average gas and electricity consumption per household, winter 2011/12 and winter 2012/13[6]



[5] Average consumption per household is calculated by taking the total gas and electricity consumption from tables 4.1 (gas) and 5.5 (electricity) from DECC's Energy Trends publication, and dividing by DECC estimates of the number of gas and standard electricity consumers.

[6] Standard electricity consumption excludes consumption by households with time of use tariffs

The effect of consumption and energy prices on winter energy bills

By comparing scenarios based on different levels of energy prices[7] and energy consumption, it is possible to estimate the effects of price and consumption changes on gas and electricity bills. To do this, we consider energy bills under four scenarios:

1. 2011/12 energy prices, 2011/12 energy consumption – this should give an indication of actual bills in winter 2011/12.
2. 2012/13 energy prices, 2012/13 energy consumption – this should give an indication of actual bills in winter 2012/13.
3. 2011/12 energy prices, 2012/13 energy consumption – this should give an indication of what energy bills would have been in 2012/13 if energy prices had not changed from the previous winter.
4. 2012/13 energy prices, 2011/12 energy consumption – this should give an indication of what energy bills would have been in this winter if energy consumption had not changed from the previous winter.

Table 1 shows energy bills under each of these scenarios.

Table 1: Average gas bills in winter 2011/12 and winter 2012/13, under scenarios where energy prices, energy consumption, or both change[8]

	Average gas bill (£)	Average standard electricity bill (£)	Average dual fuel bill (£)
Actual bill for winter 2011/12	502	342	844
Bill for winter 2012/13 if energy consumption had not changed	522	352	875
Bill for winter 2012/13 if energy prices had not changed	583	351	934
Actual bill for winter 2012/13	607	362	969

This table shows that increasing energy consumption, largely due to the cold weather, caused average dual fuel energy bills to increase by approximately £90 between the winters of 2011/12 and 2012/13. Meanwhile, increasing energy prices caused bills to increase by approximately £31.

The vast majority of the effect of rising consumption on dual fuel bills can be attributed to the gas component. Because this is the fuel used by most households for space heating, any cold weather is likely to mean a large rise in gas consumption, and therefore gas bills will rise by more than standard electricity bills (excluding time of use tariffs). Data on domestic energy consumption by end use and fuel is published in Energy Consumption in the UK (ECUK), table 3.7[9]. According to this data, gas accounts for 80 per cent of domestic fuel used for heating.

Conclusion

The cold winter of 2012/13 caused a large increase in household energy bills compared with the previous winter, which had been comparatively mild. Although both energy prices and increased consumption contributed to this increase, it is clear that energy consumption changes, driven by the colder weather, had a greater impact over the winter.

User Feedback

Please send any comments or queries regarding this analysis to the contact details below:

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[7] Energy prices for the two winters are calculated using the fixed and variable energy costs for 2012, produced in tables 2.2.4 (standard electricity) and 2.3.4 (gas) of DECC's Quarterly Energy Prices (QEP) publication. These were then adjusted using the monthly Retail Price Index (RPI) data, published by the Office for National Statistics (ONS).
[8] Numbers do not sum because of the combined effects of changes in energy consumption and price rises.
[9] www.gov.uk/government/publications/energy-consumption-in-the-uk