Domestic energy bills in 2012: The impact of variable consumption

Introduction

DECC publishes estimates of annual domestic electricity and gas bills in its Quarterly Energy Prices (QEP) publication. These bills are based on quarterly pricing information collected from energy suppliers. They are calculated using standard annual consumption assumptions of 3,300kWh for standard electricity, 6,600kWh for Economy 7 electricity, and 18,000kWh for gas. These assumptions allow for easy price comparisons between years, removing the impact of weather and energy efficiency measures.

Table 1: Domestic energy bills based on fixed consumption (current terms)[1]

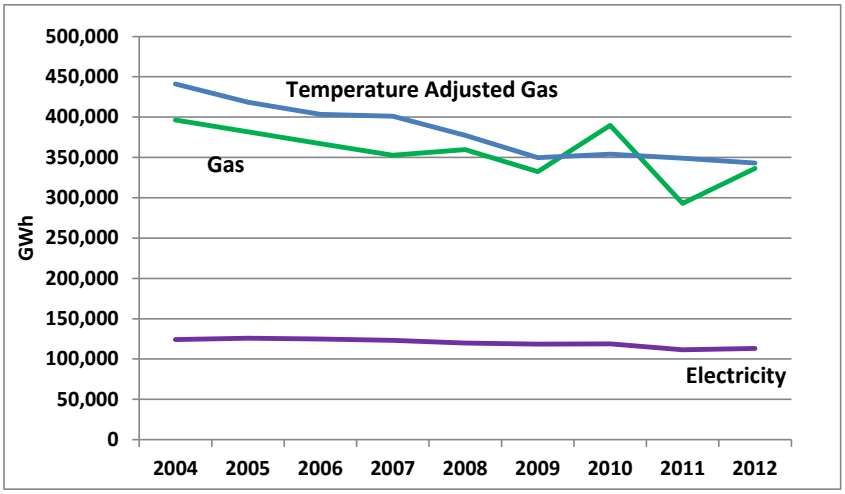
	Gas	Standard Electricity	Combined Bill
2008	£604	£425	£1,029
2009	£680	£430	£1,110
2010	£658	£418	£1,076
2011	£719	£453	£1,172
2012	£800	£479	£1,279
2011-12 % Change	*11.3%*	*5.7%*	*9.1%*

In the March 2012 edition of Energy Trends we first published final calendar year bills based on actual average household consumption for the years 2009 through to 2011. This article uses household consumption data to calculate these bills for the year 2010 through to 2012.

Annual Domestic Energy Consumption

Quarterly data on energy consumption is published in tables 4.1 (Gas) and 5.2 (Electricity) of Energy Trends. The data is collected from a variety of sources - supplier surveys, DECC administrative systems, data modelling – and is combined to provide quarterly and annual figures. Chart 1 shows the trends in energy consumption in the UK from 2004 to 2012.

Chart 1: Annual domestic energy consumption in the UK: 2004-2012 (GWh) [2]



Although this period has seen some large fluctuations in annual energy consumption (particularly for gas), the trend is of generally falling consumption between 2004 and 2012.

This is likely to be as a result of a number of factors, which include price changes, weather patterns, and increased household energy efficiency in the form of greater insulation and increased efficiency of boilers, lighting, and appliances.

[1] Gas data within this article refers to Great Britain unless otherwise stated. Electricity bills and consumption figures are based on UK data.

[2] Electricity consumption figures include both Standard Electricity and Economy 7 Electricity customers.

Price Changes

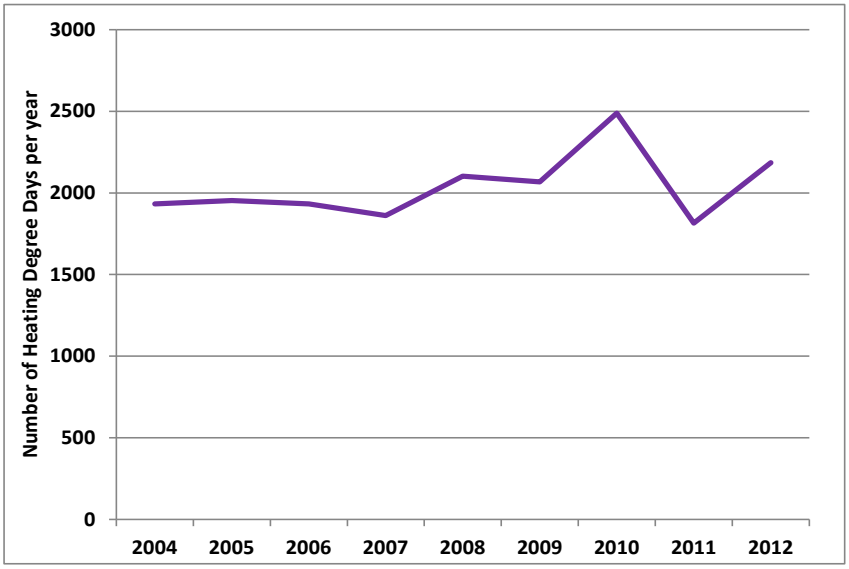
RPI data shows that gas and electricity prices have been rising in both current and real terms almost every year between 2004 and 2012. It is likely that people have reacted to these rising prices by reducing their consumption of household gas and electricity.

Following two rounds of energy price rises in 2011, small reductions in gas or electricity prices were announced by all of the big six suppliers in early 2012. However, the subsequent large rises in prices towards the end of 2012 outweighed these small reductions, causing overall annual energy prices to rise. Gas prices have generally risen by more than electricity prices in recent years. The extent of these rises is visible in Table 1, where consumption is fixed between years.

Weather

Annual changes in consumption figures have been greater for gas than electricity. In addition to the pricing factors mentioned above, this is likely to be as a result of annual variation in the demand for heating. DECC estimates that in 2011, 74 per cent of domestic gas use was for space heating, compared to only 13 per cent for electricity.[3] As a result, the degree to which changes in electricity consumption will be attributable to weather patterns will be much smaller than for gas, as far fewer households rely on electricity for heating.

Chart 2: Average Heating Degree Days 2004-2012



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.

Between 2004 and 2009 the number of Heating Degree Days per calendar year was relatively consistent. Over this period, annual energy consumption fell fairly steadily, as shown in Chart 1. In 2010 the comparatively much colder weather saw the number of Heating Degree Days jump by 20 per cent, and led to a corresponding rise in energy consumption. The warmer weather of 2011 had the opposite effect.

Average 2012 temperatures were much cooler, with the number of Heating Degree Days rising by 20 per cent compared to 2011. This led to an increase in demand for electricity and gas for heating resulting in greater consumption of energy by the domestic sector in 2012 than in 2011.

[3] Energy Consumption in the UK: Table 3.7

Annual Domestic Energy Bills based on Actual Consumption

Table 2 shows estimates of annual household consumption of gas and electricity for 2008 – 2012. These are calculated by dividing total energy consumption figures shown in Chart 1 by DECC estimates of customer numbers on each fuel type.[4]

Table 2: Average annual household consumption in kWh 2008-2012 [5]

	Standard Electricity	E7 Electricity	Total electricity	Gas
2008	4,130	6,430	4,510	16,550
2009	4,130	6,180	4,440	15,230
2010	4,090	6,230	4,420	17,800
2011	3,830	5,850	4,120	13,260
2012	3,780	6,430	4,160	15,180
2011-12 % Change	*-1.3%*	*9.9%*	*1.0%*	*14.5%*

Most energy tariffs are comprised of a fixed and a variable element. These can be in the form of either a Standing Charge and Single Unit price structure, or a tariff whereby a customer pays a high price for a set number of units of energy consumed, and any subsequent consumption is paid for at a lower unit rate. The average fixed and variable prices and corresponding bills for 2010-2012 can be seen in table 3 below:

Table 3: Average Fixed and Variable prices and corresponding bills under both actual and assumed consumption levels [6] [7]

		Average Annual Fixed Cost (£)	Average Peak Unit Price (p/kWh)	Average Off Peak Unit Price (p/kWh)	Bill using standard consumption	Bill using actual consumption
Gas	2010	94.09	3.14		£658	£652
	2011	106.63	3.40		£719	£558
	2012	112.74	3.82		£800	£693
Standard Electricity	2010	44.50	11.30		£418	£507
	2011	56.38	12.02		£453	£517
	2012	60.72	12.66		£479	£539
Economy 7 Electricity	2010	72.00	13.22	5.09	£652	£619
	2011	70.88	14.48	5.65	£708	£636
	2012	75.15	15.28	6.20	£757	£739
Combined Bill (Gas + Std Electricity)	2010				£1,076	£1,159
	2011				£1,172	£1,075
	2012				£1,279	£1,232

From 2010 to 2012, bills based on standard consumption assumptions have been rising consistently between years. This reflects price increases during this period. However, when variations in annual consumption are taken into account, a different trend for each payment type is evident.

[4] DECC estimates that in 2012 there were 23.3 million domestic Standard electricity customers and 3.9 million Economy 7 electricity customers in the UK, and 22.0 million domestic Gas customers in Great Britain. These figures are based on DCLG household numbers published in Table 3.3 of DECC's Energy Consumption in the UK, data collected through the Domestic Fuel Inquiry, and other sources.

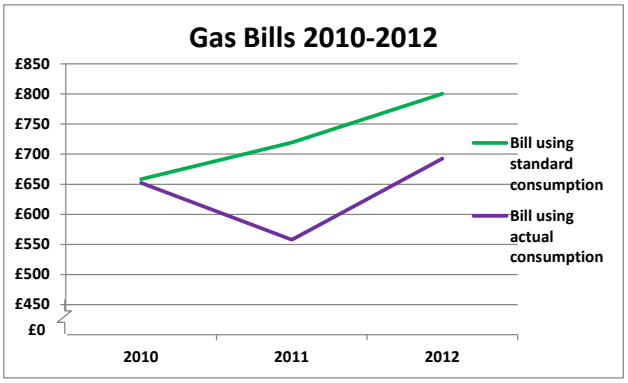
[5] Total domestic consumption figures are available in DUKES tables 4.2 (Gas) and 5.3 (Electricity).

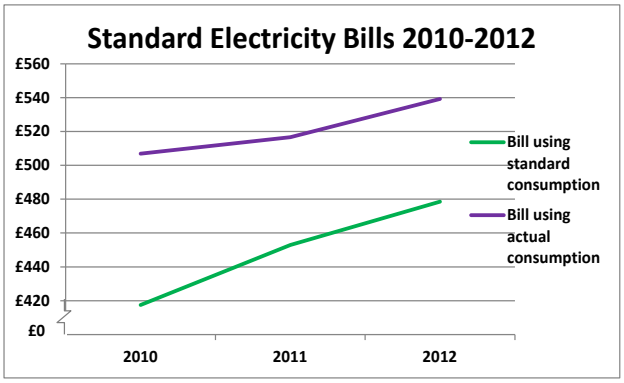
[6] The average unit prices are published in QEP tables 2.2.4 (Electricity) and 2.3.4 (Gas).

[7] Economy 7 electricity tariffs are based on different prices for units consumed during the day (peak) and night (off-peak). Our bills calculations assume 55% of electricity is consumed at the lower night rate.

The large drop in gas consumption between 2010 and 2011 outweighed the effects of the rising prices, and so bills based on actual consumption fell. When consumption rose again in the cooler 2012, bills rose to their peak level over this three year period, as a result of both the higher consumption and higher prices.

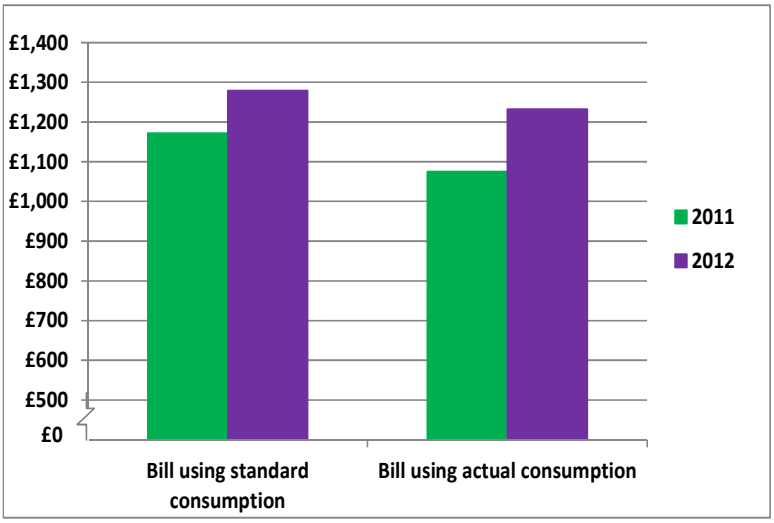
Charts 3 and 4: Annual Gas and Standard Electricity Bills 2010-2012





The impact of weather on standard electricity consumption is much less than for gas, as mentioned earlier. As a result, standard electricity consumption fell steadily between 2010 and 2012, which is likely to be due to improvements to the energy efficiency of lights and appliances as opposed to movements in annual average temperatures. These falling consumption levels meant that although actual bills did rise between these years (due to rising prices), they did not rise by as much as they did under standard consumption assumptions.

Chart 5: Combined Energy Bills 2011-2012



Between 2011 and 2012, combined energy bills rose when calculated both with standard consumption assumptions, and actual consumption figures. Combined bills based on actual energy consumption were £1,075 in 2011, and rose by £157 (14.6%) to £1,232 in 2012.

Average household gas consumption rose by 14.5 per cent between 2011 and 2012. Combined with the effects of price increases implemented by energy suppliers in 2012, actual gas bills rose by £135 over this period.

For standard electricity, average household consumption fell by 1.3 per cent between 2011 and 2012. This was not enough to counteract the effects of the price rises implemented by suppliers at the end of 2011 and 2012, and so actual average standard electricity bills rose by £22 between 2011 and 2012.

User Feedback

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

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