

Domestic energy bills in 2016: The impact of variable consumption

Summary

Actual annual gas and standard electricity bills have fallen from 2015 to 2016, by 5.5 and 0.6 per cent respectively. This is primarily due to decreases in gas prices in 2015 and 2016, and decreases in consumption of electricity. Combined annual actual bills are at their lowest since 2011 at £1,134. When controlling for seasonal variation the long term trend of decreasing energy consumption has continued, though actual gas consumption in 2016 did increase on the previous year due to colder average temperatures.

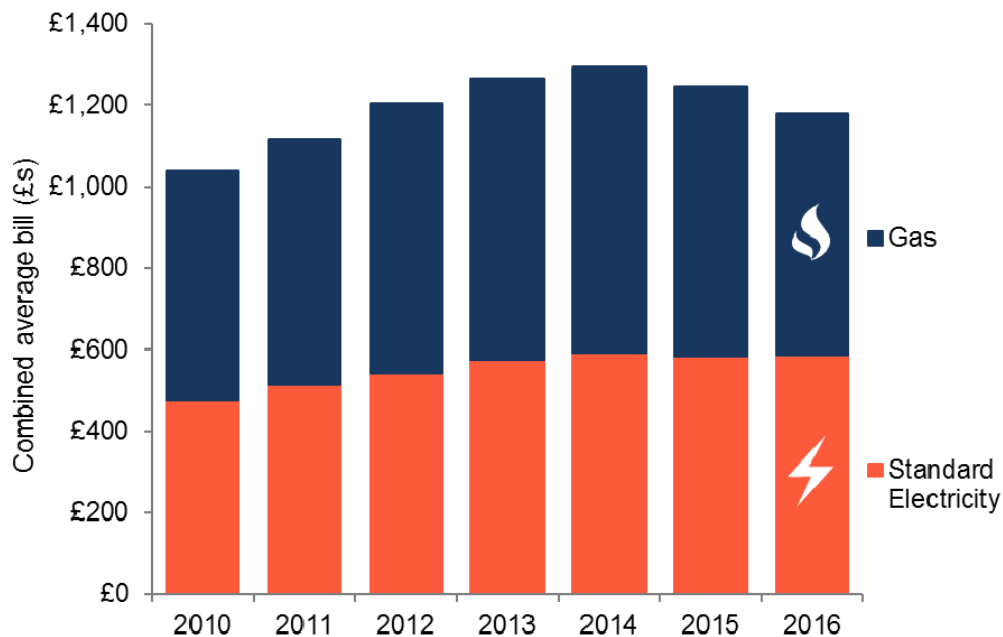
Drivers of actual bills

The two key drivers of actual bills are the unit prices of energy and the amount of energy consumed. There are several further factors that influence consumption, such as increased energy efficiency through household insulation or more efficient appliances, but the most influential factor of gas consumption is the weather.

Drivers of actual bills - price changes

Annual energy bills can be calculated based on fixed energy consumption levels: a given consumption level of energy that does not change from year to year¹. This allows price comparisons between years as the impacts of weather and energy efficiency measures on bills that influence consumption are removed. Average combined bills between 2010 and 2016 are shown in Chart 1.

Chart 1: Domestic energy bills based on fixed consumption levels 2010-2016²



¹ BEIS 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 3,800kWh for standard electricity, 6,000kWh for Economy 7 electricity (3000kWh day units and 3000kWh night units), and 15,000kWh for gas.

² Gas data within this article refers to Great Britain unless otherwise stated. Electricity bills and consumption figures are based on UK data.

Special feature - Domestic energy bills in 2016

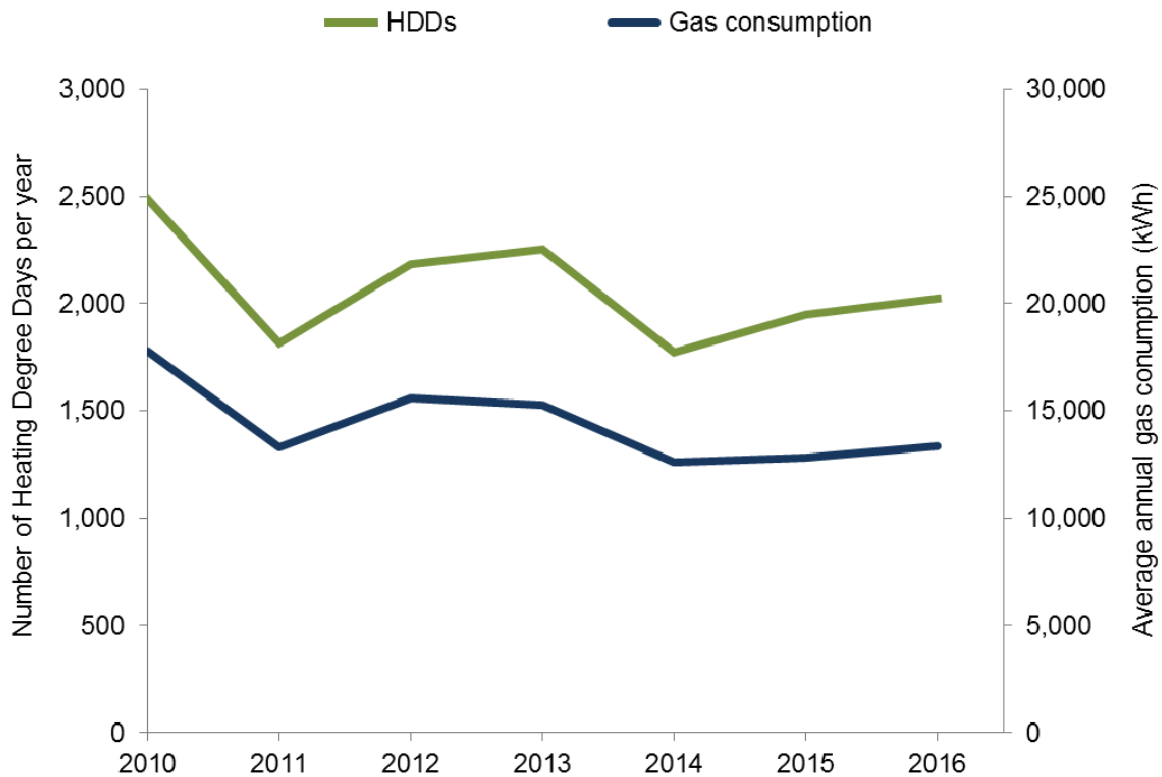
From 2010 to 2014 combined bills based on fixed consumption levels have increased, gas bills rising at a quicker rate than standard electricity bills. Since 2014 they have begun to fall again; a £12 rebate applied to Great British electricity bills in 2014 and 2015 helped to prevent further increases in electricity bills, while gas price cuts by the big six domestic energy suppliers in 2015 and 2016 reduced gas bills.

Drivers of actual bills – consumption

Weather conditions are a key factor affecting the amount of energy consumed, as people will consume more energy during a colder year to heat their homes. Variation in consumption is far greater for gas than electricity as a result of variation in the demand for heating. BEIS estimates that in 2015, 84 per cent of domestic gas use was for space heating, compared to only 23 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 use electricity for heating compared to other purposes.

Heating Degree Days (HDDs) can be used to assess average temperatures over time, as a measure of the heating needed to raise a building's temperature to a given level⁴. As Chart 2 shows, HDDs and gas consumption follow very similar trends, as people consume gas to heat their homes proportionally to the heat needed to achieve the given temperature.

Chart 2: Heating Degree Days 2006-2016

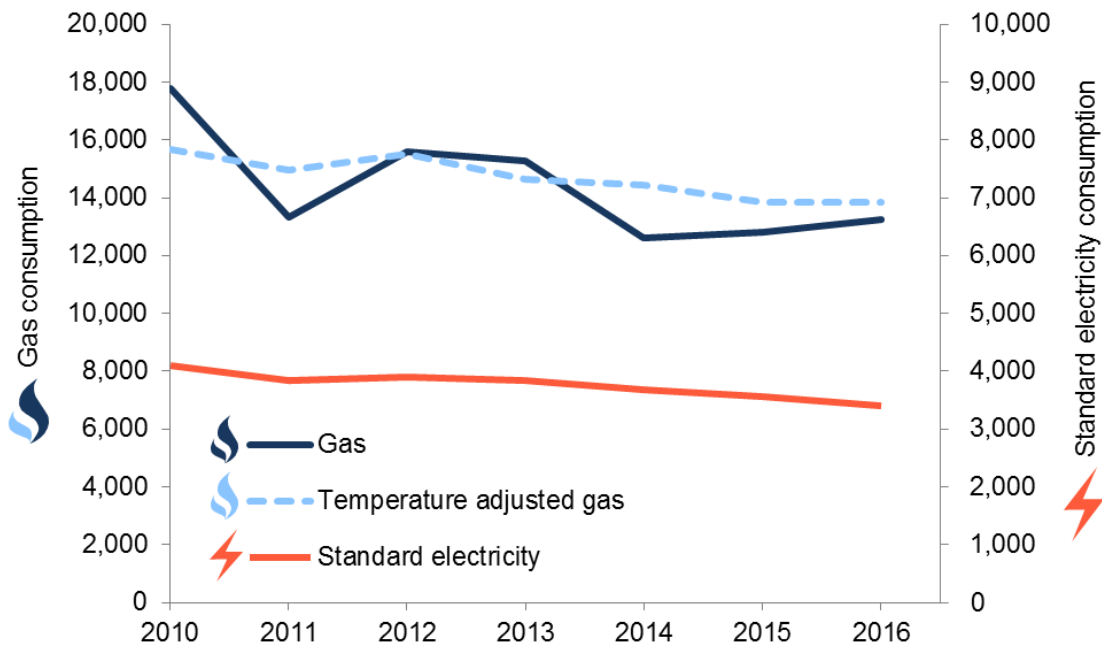


³ Energy Consumption in the UK: Table 3.02

⁴ HDDs are calculated relative to a base temperature (BEIS uses 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.

Although consumption does vary from year to year, the long term trend is of declining energy use. This is likely to be as a result of a number of factors, which include weather patterns and increased household energy efficiency in the form of both greater insulation and increased efficiency of boilers, lighting and appliances. This is more apparent when adjusting gas consumption to remove changes in consumption attributable to fluctuating temperatures, as shown in Chart 3.

Chart 3: Average annual domestic energy consumption in the UK: 2010-2016 (kWh)⁵



The average consumption of standard electricity has slightly decreased from 2015, whereas average electricity consumption for E7 consumers has slightly risen. Consumers with E7 meters typically heat their homes through electricity rather than gas, so the consumption has therefore increased, similarly with gas, due to the colder weather and a greater demand for heating in 2016.

Table 1: Average annual household consumption in kWh 2011-2016⁶

	Standard electricity	E7 electricity	Total electricity	Gas
2010	4,098	6,226	4,423	17,783
2011	3,841	5,843	4,134	13,307
2012	3,905	6,089	4,216	15,577
2013	3,849	5,943	4,077	15,280
2014	3,670	5,585	3,933	12,609
2015	3,556	5,961	3,867	12,817
2016	3,509	5,990	3,830	13,351
Change 2015 - 2016	-1.3%	0.5%	-1.0%	4.2%

⁵ Electricity consumption figures include both Standard Electricity and Economy 7 Electricity customers.

⁶ Total domestic consumption figures are available in DUKES tables 4.2 (Gas) and 5.3 (Electricity). Average domestic consumption is calculated by dividing total domestic consumption by BEIS' estimates of customer numbers on each fuel type: 24 million domestic Standard electricity customers and 3.6 million Economy 7 electricity customers in the UK, and 23 million domestic Gas customers in Great Britain. These figures are based on data collected through the Domestic Fuel Inquiry.

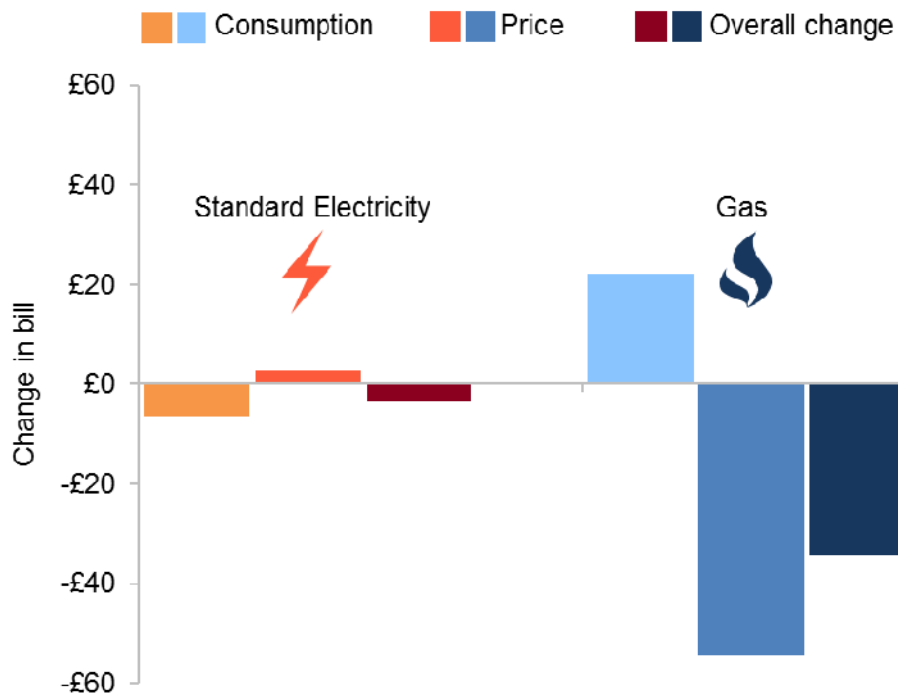
Annual domestic energy bills based on actual consumption

The extent to which price and consumption changes cause overall bill changes can be analysed by holding one driver constant so any change in the bill is attributable to the other.

If standard electricity prices had remained static from 2015 to 2016 bills would have decreased by £6 due to the fall in consumption. If consumption had remained static bills would have increased by £3 due to the increase in price. The combination of these factors caused average standard electricity bills to decrease by £3.

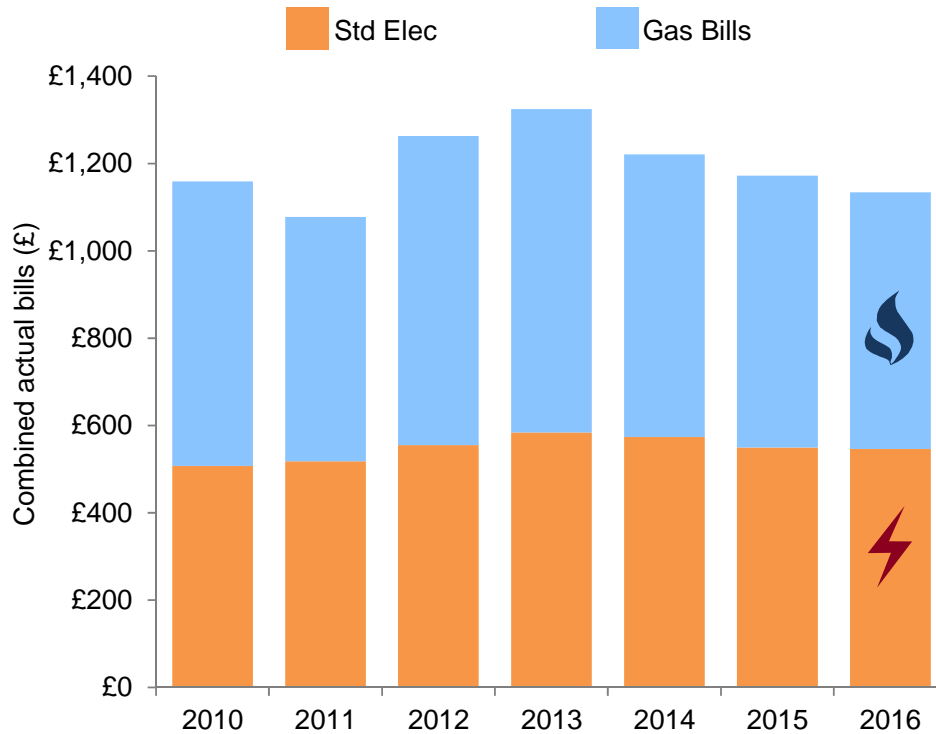
Converseley for gas, if prices had remained static from 2015 to 2016 bills would have increased by £22 due to increased consumption due to the colder temperatures in 2016. Whereas if consumption had remained static bills would have decreased by £54 due to the decrease in prices. Together, these factors resulted in a decrease of £34 for the average actual gas bill. This is demonstrated in Chart 5 below.

Chart 4: 2015 to 2016 changes in energy bills attributable to changes in consumption and price



Due to these falls in standard electricity and gas bills, actual combined bills in 2016 are the lowest they have been since 2011 at £1,134, a decrease of 3.2 per cent on the previous year. Actual gas bills decreased by 5.5 per cent and standard electricity bills by 0.6 per cent.

Chart 5 shows actual annual bills over time in the same format Chart 1 shows bills at fixed consumption levels over time. Differences between the two can largely be attributed to the impact of variable consumption.

Chart 5: 2010 to 2016 average actual annual bills**Table 2: Average energy bills on actual consumption**

	Standard Electricity	Gas	Total
2010	£508	£652	£1,159
2011	£518	£559	£1,077
2012	£555	£708	£1,263
2013	£584	£740	£1,324
2014	£574	£647	£1,221
2015	£549	£622	£1,172
2016	£546	£588	£1,134
Change 2015 - 2016	£-3	£-34	£-38
% Change	-0.6%	-5.5%	-3.2%

In summary, actual annual energy bills are at their lowest since 2011, at £1,134. This is largely due to gas price decreases in 2015 and 2016 which have outweighed the temperature related increases in gas consumption over the same period. Electricity prices have remained relatively static in recent years, whilst the long term trend of decreasing electricity consumption has led to reduced electricity bills.

User feedback

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

Liz Vincent

Energy Prices Statistics

Tel: 0300 068 5162

E-mail: Elizabeth.Vincent@beis.gov.uk

Reuben Pullan

Energy Prices Statistics

Tel: 0300 068 5057

E-mail: Reuben.Pullan@beis.gov.uk