

## Analysis of kWh gas consumption in homes with gas central heating

The intention of this study is to identify from published data the typical total gas consumption for heating in homes. This figure can then be used to assess the potential savings from heating controls.

### Total gas consumption

BEIS publishes annual estimates of gas and electricity bills, along with statistics on household expenditure on fuel<sup>1</sup>. The current figure used in this estimate for gas is **13,600 kWh**.

However, this has been calculated by dividing the total gas consumption by the total number of household gas customers<sup>2</sup>. It is therefore likely to underestimate the typical gas consumption of a fully centrally heated home as it includes homes with partial gas heating, or which only use small amounts of gas for a specific use such as cooking.

Ofgem publish Typical Domestic Consumption Values (TDCVs), which are generally used by energy suppliers to provide comparisons of different tariffs<sup>3</sup>. These have been suspended to take account of the Covid pandemic, but the most recently updated figures published in January 2020 provide a split across consumption types:

	kWh	TDCVs
Gas	Low	8,000
	Medium	12,000
	High	17,000

In 2012, Ofgem commissioned the Centre for Sustainable Energy (CSE) to develop a more sophisticated split of typical consumption figures<sup>4</sup>, and these were most recently updated in 2014<sup>5</sup>. When broken down into heating types, this showed gas heated households having a mean annual gas consumption of **15,911 kWh**.

The BEIS calculation for average gas consumption referenced above shows a reduction in average gas consumption from 14,154 kWh to 13,606 kWh since 2014. Hence, we can adjust the CSE figure (15,911 kWh) by an equivalent 3.8%, given us a mean annual gas consumption of **15,295 kWh**.

---

<sup>1</sup> <https://www.gov.uk/government/statistical-data-sets/annual-domestic-energy-price-statistics>

<sup>2</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/886473/annual-domestic-gas-electricity-consumption-levels-review-methodology-note.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886473/annual-domestic-gas-electricity-consumption-levels-review-methodology-note.pdf)

<sup>3</sup> [https://www.ofgem.gov.uk/sites/default/files/docs/2020/01/tdcvs\\_2020\\_decision\\_letter\\_0.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2020/01/tdcvs_2020_decision_letter_0.pdf)

<sup>4</sup> <https://www.ofgem.gov.uk/sites/default/files/docs/2013/07/beyond-average-consumption.pdf>

<sup>5</sup> [https://www.cse.org.uk/downloads/reports-and-publications/policy/beyond\\_average\\_consumption\\_update\\_2014.pdf](https://www.cse.org.uk/downloads/reports-and-publications/policy/beyond_average_consumption_update_2014.pdf)

### Proportion of gas consumption used for heating

Heating is estimated as 77.2% of total gas use<sup>6</sup>, with the rest being used for hot water and cooking. This gives us a mean annual gas consumption of 77.2% of 15,295 kWh, which equals **11,808 kWh**.

### Gas consumption by dwelling type

The type of property has a significant effect on the amount of gas used for heating. While other factors regarding the property, in addition to household characteristics and area can play their part this would over-complicate the purpose of this analysis.

Work by BRE comparing design heat loss for typical UK homes<sup>7</sup> provides a percentage difference that would be comparable with the heating energy consumption. The full breakdown is shown below:

	Year built	Design heat loss estimate (kW)					
		Flat	Mid terrace	End terrace	Semi detached	Detached	Average
Pre-mid 60s	pre 1900	8.3	9.1	14.8	15.5	22.1	13.9
	1900-1929	5.3	8.1	11	12	17.6	10.8
	1930-1949	5.1	6.8	8.7	9.2	14.7	8.9
	1950-1966	4.1	5.9	7.5	7.6	11.3	7.3
Mid 60s - 1991	1967-1975	3.6	5.9	6.8	7.7	11.6	7.1
	1976-1982	2.8	4.9	6.2	6.4	10.1	6.1
	1983-1990	2.4	4.6	5.4	5.3	9.5	5.4
Post 1991	1991-1995	2.4	4.4	5.3	5.1	9.9	5.4
	1996-2002	2.5	4.7	5.8	5.1	9.1	5.5
	2003-2006	2.3	4.9	4.9	4.5	8.8	5.1
	post 2007	2.1	4	4.5	4.2	9.9	5
	<b>Average</b>	3.7	5.8	7.4	7.5	12.2	7.3

Using the relative proportions of the overall averages in this table, and applying these to the estimate of annual gas consumption provides the following:

House type	Design heat loss estimate (kW)	Relationship to average (%)	Annual heating gas consumption (kWh)
Average	7.3	100.0	11,808
Flat	3.7	50.7	5,985
Mid-terrace	5.8	79.5	9,382
End-terrace/semi-detached	7.5	102.7	12,132
Detached	12.2	167.1	19,734

<sup>6</sup> <https://www.gov.uk/government/statistics/united-kingdom-housing-energy-fact-file-2013>

<sup>7</sup> <https://tools.bregroup.com/heatpumpefficiency/dwelling-heat-loss>