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Methodology

Assessing typical household energy bills

Climate Change Committee

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Overview

This document summarises the key assumptions and data sources used by the Climate Change Committee to assess typical household costs and energy bills.

Typical household characteristics

- The typical household is based on median (or modal, where there are a range of discrete options) household characteristics for the UK. This is a semi-detached, owner-occupied house with the same home energy demand as Ofgem's typical dual fuel household, and median car mileage based on the National Travel Survey (Table 1).
  - We model a 'fossil fuel household' with a gas boiler and one petrol car, purchased in the used car market.
  - We model an 'electric household' with an air source heat pump, a time-of-use tariff, and one electric car, purchased in the used car market.
- We model gas boiler and heat pump efficiencies of 0.85 and 2.94 respectively, and petrol car and EV efficiencies of 0.062 litres per km and 0.19 kWh per km respectively. These are based on the efficiencies used in our report The Seventh Carbon Budget.
- Factors such as energy demand, access to capital, and access to savings through home charging and time-of-use tariffs will vary significantly for different types of household. We assess this further in our report Progress in reducing emissions 2026 report to Parliament.

Table 1 Typical household characteristics

Fossil fuel heating technology	**Electric heating technology**	**Initial gas consumption** (kWh per year)	**Initial electricity consumption** (kWh per year)	**Fossil fuel car type**	**Electric car type**	**Mileage** (km per year)
Gas boiler	Air source heat pump	9,500	2,500	1 used petrol car	1 used electric car	12,400

Notes: Initial gas and electricity consumption figures are based on Ofgem's latest Typical Domestic Consumption Values (TDCV).[1] Car mileage is based on the National Travel Survey.[2]

Energy prices

- We model electricity and gas prices, including standing charges and unit rates, from Ofgem's most recent price cap announcement.[3] We model petrol and public EV charging prices based on the most recent monthly data from DESNZ and Zapmap respectively.[4;5]
- We also include a historical time series showing the most recent data available at the time of publication of the price cap for each quarter. For example, for the Q1 2027 price cap announced in November 2026, the most recent electricity and gas data is for Q1 2027, while the most recent petrol and public EV charging data is for the month of October 2027.

Time-of-use tariffs and flexible energy demand

- We model a tri-rate time-of-use tariff with off-peak and peak rates that are 50% lower and higher than the standard rate respectively. This is based on a review of a range of available time-of-use tariffs. We assume the standard rate to be equal to the unit rate specified in the price cap announcement.

- We have reviewed published estimates of the level of electricity demand adjustment observed under flexible tariffs, for households with heat pumps.[6] Based on this evidence, we estimate the proportion of peak demand shifted to standard and off-peak hours (Table 2).

Table 2 Time-of-use tariffs and electricity consumption

Scenario	What does electricity consumption include?	Percentage of consumption during peak hours	Percentage of consumption during standard hours	Percentage of consumption during off-peak hours
Standard tariff, with a gas boiler	Non-heat only	17%	54%	29%
Time-of-use tariff, with a heat pump	Heat and non-heat	5%	39%	56%

Note: Peak hours are 16:00-19:00, standard hours are 00:00-04:00, 07:00-13:00, and 19:00-22:00, and off-peak hours are 04:00-07:00, 13:00-16:00, and 22:00-00:00.

Electric car charging

- We model a typical household with access to home charging. This household mostly charges at home, during off-peak hours, but also uses some public charging. The proportion of charging at home and in public is based on internal analysis for our report Progress in reducing emissions 2026 report to Parliament.

  - For the typical electric household, 84% of electricity demand for car charging is met by a home charger. When charging at home, we assume the car is being charged at the same off-peak time-of-use tariff rate outlined above.

  - The remaining charging demand is split between slow/fast and rapid/ultra-rapid public chargers, making up 6% and 10% of electricity demand respectively. We use public charging prices from Zapmap.[7]

Upfront and maintenance costs

- We use upfront and maintenance cost assumptions in line with our report Progress in reducing emissions 2026 report to Parliament.

- We assume heating systems are only installed, and cars only purchased, when the previous heating system or car is due to be replaced. In this analysis we model a household that is due to replace both its heating system and car in the current year.

- Home energy upfront costs include technology costs, installation costs (including one-off retrofit costs), and financing costs. We also model policy support, including a £7,500 upfront

grant and a five percent reduction in interest rates for heat pumps, based on the Boiler Upgrade Scheme grant and Warm Homes Loan Scheme.

- Transport upfront costs include purchase costs and financing costs for petrol cars, electric cars, and at-home chargers.

- Upfront costs are annualised over the lifetime of the technology. For heat pumps, we split costs into longer-term home upgrades (for example, upgrading radiators) and technology costs (for example, the cost of the heat pump itself), with varying lifetimes (Table 3).

Table 3 Upfront technology costs

Variable	Cost (£)
Petrol car (used)	12,600
Electric car (used)	12,600
At-home charger	1,000
Gas boiler	2,600
Heat pump capital cost	9,400
Heat pump ancillary/installation costs	5,900
Grant support for heat pump	7,500

Notes: We assume that cars, at-home chargers, gas boilers, and heat pumps have a lifetime of 15 years, and that one-off heat pump ancillary costs such as radiator upgrades and wiring have a lifetime of 50 years.

Interest rates

- We use interest rates in line with Chapter 5 of our report Progress in reducing emissions 2026 report to Parliament.

- For used car purchases, we assume the initial payment is 10% of the upfront cost and is subject to a 3.5% opportunity cost. The remainder of the cost we assume is financed through a loan, at an 8.9% interest rate.

- The Warm Homes Plan announced that low and zero interest loans will be available for heat pumps, but did not specify the interest rate of these loans. For this analysis we assume this policy reduces rates by up to 5% from market rates, which in practice means the typical households receives a zero-interest loan. For gas boilers, we assume an interest rate of 4.2%.

Endnote

[1] Ofgem (2026) *Energy price cap (default tariff) levels.* https://www.ofgem.gov.uk/energy-regulation/domestic-and-non-domestic/energy-pricing-rules/energy-price-cap/energy-price-cap-default-tariff-levels

[2] Department for Transport (2026) *Vehicle mileage and occupancy*. https://www.gov.uk/government/statistical-data-sets/nts09-vehicle-mileage-and-occupancy.

[3] Ofgem (2026) *Energy price cap (default tariff) levels.* https://www.ofgem.gov.uk/energy-regulation/domestic-and-non-domestic/energy-pricing-rules/energy-price-cap/energy-price-cap-default-tariff-levels

[4] Department for Energy Security and Net Zero (2026). *Monthly and annual prices of road fuels and petroleum products*. https://www.gov.uk/government/statistical-data-sets/oil-and-petroleum-products-monthly-statistics

[5] Zapmap (2026) *Zapmap Price Index*. https://www.zapmap.com/ev-stats/charging-price-index

[6] Centre for Net Zero (2024) *Decarbonising Heat: The Impact of Heat pumps and a time of use tariff on energy demand*. https://www.centrefornetzero.org/papers/decarbonising-heat-the-impact-of-heat-pumps-and-a time-of-use-heat-pump-tariff-on-energy-demand

[7] Zapmap (2026) *Zapmap Price Index*. https://www.zapmap.com/ev-stats/charging-price-index

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10 South Colonnade
Canary Wharf
London
E14 4PU

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