

The electro-fortification of Britain – Methodology report

Published: 23 September 2026

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The source for this is from DESNZ, DUKES Table 1.1 of aggregate energy commodity balances, in gross calorific values (Mtoe). It covers final energy consumption by sector, apart from electricity generation which is not a final energy consumer. The fossil consumption for the other sectors excludes that used in electricity. DESNZ definitions of Industry, Transport, and Domestic have been taken, while smaller or sub-sectors consuming less than 10 Mtoe in 2025 have been excluded, namely: Public administration, Commercial, Agriculture, Miscellaneous, Non-energy use. Commercial had a mid-series redefinition in 2008, and Industry was revised in 2025 to fall below the 10 Mtoe threshold, but has been retained as, until recently, it was a significant sector. The limitations of this approach: DUKES data is only available to 2025, and is subject to revision.

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Ember electricity data explorer, annual electricity generation in TWh for the United Kingdom.

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Analysis of NESO hourly historic generation data – fossil gas definitions as defined by NESO.

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Energy prices are significant contributors to CPI. Per ONS: CPI inflation increased by 10.4% in the 12 months to February 2023. Of this increase, 33% was explained by the direct energy effects. The "very high" energy intensive goods and services explained a further 20% and the "high" energy intensive goods a further 25%. Source [Accessed Sep 2026]: <https://www.ons.gov.uk/economy/inflationandpriceindices/articles/theenergyintensityoftheconsumerpricesindex/2022#contributions-to-cpi-inflation-by-energy-intensity>

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Data on the average monthly price of premium unleaded petrol in the UK (p/litre) is sourced from the UK Government Department for Energy Security and Net Zero (DESNZ) table Monthly: Typical/average annual retail prices of petroleum products and a crude oil price index (QEP 4.1.1 to 4.1.3).

Gas system average price data (p/kWh) is sourced from the Office for National Statistics (ONS) System Average Price (SAP) of gas. Monthly average, non-seasonally adjusted, as traded in Great Britain over the On-the-Day Commodity Market (OCM).

Rate of inflation (%) for the UK is sourced from the Office for National Statistics (ONS) Consumer price inflation time series (MM23) table, 12-month rate of inflation.

All data is from January 2018 to June 2026.

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Source: The DESNZ DUKES table 5.14 is used for the 'estimated carbon dioxide intensity of electricity supplied'. An LED of 3W is assumed equivalent to an incandescent 30W bulb.

The electricity unit rate from the 1 July to 31 September 2026 price cap of 26.11p/kWh is used, meaning a 3W LED can be used for 12.77 hours at a cost of 1 penny.

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Source: For the emissions from an electric car, the emissions are defined as those from the electricity generated to supply an electric vehicle, assumed to be using the GB electricity grid. The Battery Electric efficiency (kWh (net)/mile) value of 0.33243 is used from the government GHG conversion factors 2025 full set data (tab – SECR kWh UK electricity for EVs). And the DESNZ DUKES table 5.14 is used for the 'estimated carbon dioxide intensity of electricity supplied'. A standardised mileage of 7,000 miles driven per year is kept constant across the time series and two car types. Postcode level average mileage 2024 data, gave a mean mileage of 6,945.

For the petrol car, Method 2 was followed based on the following EST guide, which in short takes an average new-car efficiency factor, applies a 'real world uplift' conversion factor from DESNZ ghg guidance.

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<https://fleetdecarbonisationtoolkit.energysavingtrust.org.uk/t/decarbonisation-strategy/emissions-calculated/car-van-ghg-kwh-calculations-2/>

Limitations: Reliable sources for the most recent years are hard to find, and so estimates for petrol car fleet efficiency from 2020 – 2024 have been used and kept constant. This method also uses a fixed CO2 factor for petrol across the period.

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Source: Battery electric vehicle data from DESNZ data table VEH1103. Household Food Consumption and Expenditure reports (Ministry of Agriculture, Fisheries and Food) Link: https://assets.publishing.service.gov.uk/media/5a75bc4640f0b67b3d5c8cfc/Domestic_Food_Consumption_and_Expenditure_1968.pdf

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Source: Wholesale power price (£/MWh) is daily average, published by the LCCC. UK domestic solar capacity estimates are published monthly by DESNZ as part of ET table 6.3. Note: Wholesale is the largest component of domestic energy bills but not the only component or a majority of the unit rate.

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Six-month rolling average of monthly installs, purchases. Annotated stats are the average of Jan-2026 to Jun-2026 monthly. Battery and solar data source: MCS dashboard for domestic installations for the UK. Electric cars refers to BEVs only, source: New Automotive.

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Source: MCS dashboard for domestic battery installations in the UK. Note: MCS accreditation is not essential for battery installations and therefore the figure is assumed to be the lower bound of the overall installation total.

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DESNZ Energy Statistics ET table 6.3 for solar installation count, MCS dashboard for domestic battery installation count. Note MCS data is thought to be an underestimate, as it isn't a requirement for all battery installations, so the real figure may be far higher. Also, there is no direct evidence in the data that these battery installations are taking place alongside solar panels, however due to the requirement to get MCS accreditation for solar installation but not batteries, those batteries accredited by the MCS have been assumed to be installed alongside solar.

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n/a

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The Climate Change Committee Progress in reducing emissions 2026 report to Parliament (published 24 June 2026). A 'fossil home' is a rural household with oil heating and a diesel car. An 'electric home' is a household with a heat pump and an electric car. Home energy running costs include standing charges, heating, cooking, lighting, savings from solar panels, and other home energy use, excluding car charging as this is included in transport running costs. Transport running costs include costs of fuel, charging, car maintenance, and policy costs such as vehicle taxes, fuel duty, and per mile charges. Energy prices before the closure of the Strait of Hormuz draw on the energy price cap for Q2 2026 and heating oil, petrol, and diesel prices from Q1 2026. Prices following the start of the Iran war draw on the energy price cap for Q3 2026, and heating oil, petrol, and diesel prices from Q2 2026.

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Estimated annual savings are sourced from the Energy Saving Trust paper Flexible futures: Integrating smart tariffs with low-carbon home technologies Phase 1 report: Understanding the financial case, authored by Brian Horne, William Jamieson and Ivy Zhang (published July 2026).

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A half-hourly simulation model was developed to assess the financial implications of deploying heat pumps, solar panels and battery storage in households. With over 1.7 million scenarios included in the model, the analysis examines how interactions between technologies, tariffs and patterns of energy use influence household energy bills. Annual modelled savings included in the chart are based on a typical solar panel system generating 4,000 kWh per year and a battery with 9 kWh capacity, fitted to a gas heated home on a standard import tariff, with a combination of different types of smart export guarantees. The chart takes the median modelled annual saving for each technology and tariff combination. A 'Standard' smart export guarantee assumes 4p/kWh earned for power exported to the grid, while a 'Good' smart export guarantee assumes 15.6p/kWh. Both smart export guarantee prices are fixed throughout the day.

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Plug-in solar savings methodology sourced from Carbon Brief's Analysis: How 'plug-in solar' can save UK homes £1,100 on energy bills, authored by Ho Woo Nam (published 2 April 2026). Assumes an 800 W plug-in solar system generating 400 kWh per year on a balcony in London, with optimally placed panels that are south-facing and tilted at around 40 degrees. Assumes the household consumes 90% of the plug-in solar generated output. This analysis uses the Ofgem unit price for July–September 2026 of 26.11 pence/kWh

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This graphic was first published in the Ember 2024 report: [The UK can enhance energy security through clean electrification | Ember](#). Please see this publication for the methodology. The main change in the assumptions since publication is the clean power share, which would increase slightly in 2026.

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Upfront cost of electric vehicles and petrol cars data sourced from Autotrader. Price is the monthly average between August 2025 and July 2026. New EV prices include government grants and other discounts. The running costs for a petrol price of 150 p/litre (the average of 2026 weekly prices to the beginning of September) and an efficiency of 6.7 litres per 100km (IEA, 2026, Fuel Economy in the United Kingdom, CC BY 4.0). The running costs for an electric car are assumed at the 1 July to 31 September Ofgem price

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cap rate (26.11p/kWh) for a car charged at home, and at the smart tariff cost of 8p/kWh off peak, which is the current rate offered by both Octopus and Good Energy – accessed on 4th September 2026. The electric car price includes currently available grants, petrol equivalent cars does not

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The running costs for an electric car are assumed at the Jul-Sep 2026 Ofgem price cap rate (26.11p/kWh) for a car charged at home, and at the smart tariff cost of 8p/kWh off peak, which is the current rate offered by both Octopus and Good Energy – accessed on 4th September 2026. The standard electric car running costs are assumed at an 80:20 home/public charging split (26.11p, 54p) while the solar/smart tariff split is assumed to be 50:50 (8p for smart tariff) The export guarantee is assumed to be 10p, the average of all SEG rates published by Solar Energy UK on the 12th of May 2026, accessed on the 4th September 2026. The cost of self-consumption of solar power is priced at the value of the foregone export guarantee income of 10p/kWh.

<https://solarenergyuk.org/resource/smart-export-guarantee/>

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Source: DESNZ ET Table 6.3 for domestic solar uptake, MCS dashboard for battery and heat pump uptake. Dwellings data is based on MHCLG dwelling stock estimates 2025, Welsh government dwelling stock estimates 2025, NRS estimates of households and dwellings in Scotland 2024, LPS/ NISRA Northern Ireland housing stock 2025.

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The number of constituencies with domestic photovoltaic installations on >10% of dwellings, annually to December 2025, and to June 2026. Domestic solar photovoltaic deployment by parliamentary constituency monthly time series data, monthly cumulative solar installations reported by DESNZ. Data on the number of dwellings per constituency per year from 2015–2024 in England, Scotland and Wales is sourced from Subnational estimates of properties not connected to the gas network, published by

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DESNZ on 18 December 2025. The number of dwellings per constituency in 2025 is extrapolated based on past annual property count growth.

Analysis for Northern Ireland uses NISRA estimates of Households at Parliamentary Constituency 2024 level as a proxy for the number of dwellings. To minimise the chance of overestimating the share of dwellings with solar for part-years, the share for June 2026 is calculated using the number of dwellings estimated as of 31 December 2025 as the denominator. The share for June 2021 uses the number of dwellings per constituency as of December 2020 as the denominator.

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Source: Solar uptake by parliamentary constituency data published by DESNZ Energy Trends, count of installations joined to count of properties in DESNZ subnational energy consumption data at parliamentary constituency level, then ranked each year. Note: Only those in either the top 25 in 2016 or top 25 in 2026, are included.

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Change in share of dwellings with domestic solar photovoltaic deployed, percentage point (pp) change between June 2021 and June 2026. Data on the number of dwellings per constituency per year from 2015–2024 in England, Scotland and Wales is sourced from Subnational estimates of properties not connected to the gas network, published by DESNZ on 18 December 2025. The number of dwellings per constituency in 2025 is extrapolated based on past annual property count growth. To minimise the chance of overestimating the share of dwellings with solar for part-years, the share for June 2026 is calculated using the number of dwellings estimated as of 31 December 2025 as the denominator. The share for June 2021 uses the number of dwellings per constituency as of December 2020 as the denominator. Domestic solar photovoltaic deployment by parliamentary constituency monthly time series data, monthly cumulative solar installations reported by DESNZ. Number of installations is to June 2026 only.

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Source: (1) DfT MOT data 2023–24 by postcode area (2) DESNZ sub-national off-gas data by local authority (3) RAC Foundation data as of 2021 by local authority (4) MCS data as end of 2025

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DESNZ off-gas estimates by local authority. MCS dashboard data for domestic heat pump uptake as percentage of homes.

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Source: Ofgem Price Cap Annex 9 – Direct debit, dual fuel household including VAT and EPG. Data from Tab 1c.

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Source: NESO Future Energy Scenarios 2025 data workbook, from the Energy Flow Diagram data table, taking the Holistic Transition pathway. Total fossil consumption is a derived aggregate from the data available, and includes gas net displaced by biomethane.

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Source: DESNZ ET Table 6.3 for domestic solar count, assuming each installation is a different house. The number of off-gas grid homes is based on DESNZ estimates of off-gas homes. The number of private cars using oil-based fuels is based on SMMT 2025 Motoparc data (87.8% of passenger cars using either petrol or diesel). The off-street parking proportion is an estimate, scaled pro-rata on the number of households that have off-street parking provision. The National Travel Survey estimated that 64% of Britain's households have the potential for off-street parking. Of the 29 million estimated

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petrol and diesel private cars, assuming 64% of these produces a result of around 19 million. This is an assumption in the absence of better data.

All online data sources accessed September 2026 unless stated otherwise.