RICHARD LYON

Reliable Britain

What Britain's electricity would have cost on gas

the extra cost of net zero on electricity bills, 2002–24

£140.3bn

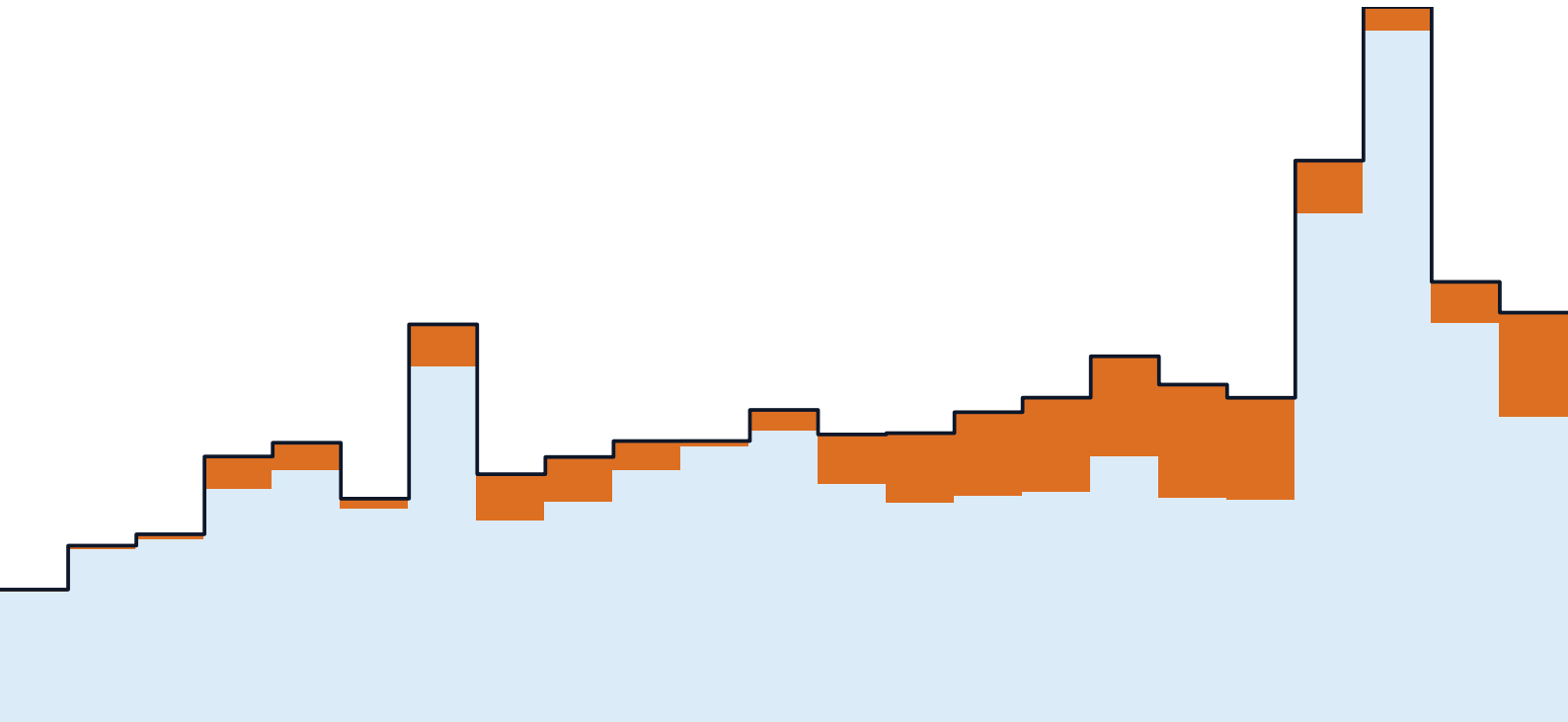
Modelled, in 2024 prices: the bill Britain paid for its electricity, less the bill for the same electricity on the gas-led alternative.

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Richard Lyon

Technical paper, model and data

richardlyon.net/research/reliable-britain



Highlights

£140.3bn

the extra cost of net zero on electricity bills

£2,286

for the average household (businesses and public bodies bore the rest)

£82.9bn

of that cost was carbon pricing

£46.7bn

how far subsidies and extra grid costs exceeded the savings they brought

Range £120.8bn to £152.7bn, depending on the main assumptions.



Photograph: Adrian Pingstone, public domain, via Wikimedia Commons

All figures are modelled, for 2002–24, in 2024 prices.

Executive summary

What has the drive to net zero added to the cost of Britain's electricity since 2002?

1 **Net zero added £140.3bn to Britain's electricity bills between 2002 and 2024.** That is £2,286 for the average household; businesses and public bodies bore the rest. Different reasonable assumptions put the total between £120.8bn and £152.7bn.
This is the electricity bill alone. On the gas-led alternative, dearer gas would also have raised gas bills for homes and industry, by £18.2bn, or £9.5bn once you allow for the extra that British gas producers would have earned. That does not change the answer.

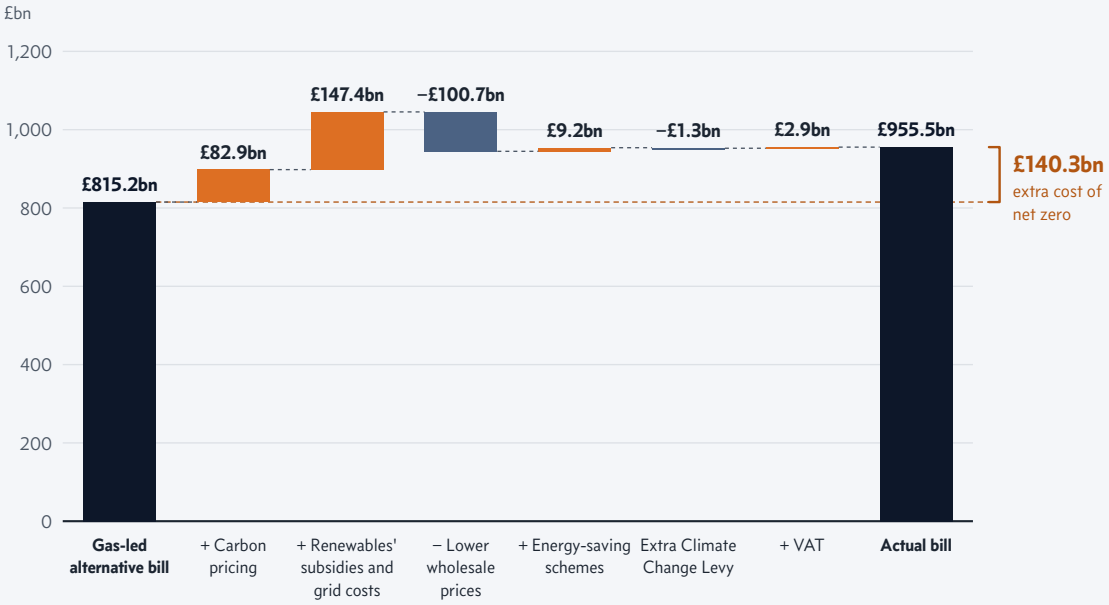
2 **Carbon pricing accounts for £82.9bn of it.** £23.7bn of that was collected as tax; the other £59.2bn raised the power price without being collected. Readers who see carbon pricing as making the polluter pay can take it out.

3 **Renewables cost more than they saved, except in 2012 and the gas crisis of 2021–23.** They cost £147.4bn in subsidies and grid costs, and saved £100.7bn by lowering wholesale prices: a net £46.7bn.

Chart 1

How net zero added £140.3bn to the bill

£bn, 2002–24, 2024 prices



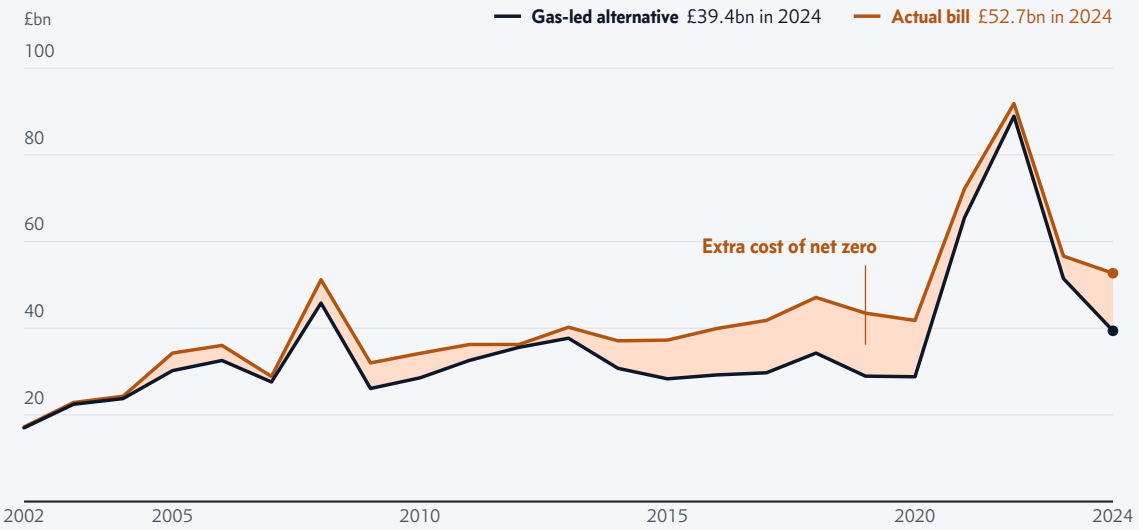
Source: the author's model of Britain's electricity bills; method and data in the technical paper. Bars may not add to the total because of rounding.

All figures are modelled, for 2002–24, in 2024 prices.

Chart 2

Britain paid more for its electricity than the gas-led alternative in every year

Total electricity bill, £bn a year, 2024 prices



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

Reading the numbers

01 The range

The £140.3bn is an estimate, because the gas-led alternative never happened. Changing each main assumption in turn moves it between £120.8bn and £152.7bn.

02 What's left out

People and firms used less electricity because it cost more. That loss, about £9.8bn, is not in the £140.3bn.

03 A fair yardstick

The gas-led alternative is not frozen in 2002: it closes and builds plant, and keeps 7.4% spare capacity, the level of security NESO recommends today.

All figures are modelled, for 2002–24, in 2024 prices.

Parliament should require a yearly statement of what each climate policy adds to electricity bills

The request

Add a new section 16A to the Climate Change Act 2008, requiring the Secretary of State to lay before Parliament each year a statement of what each climate policy adds to electricity bills in Great Britain; Parliament can make the change as a new clause to the Energy Independence Bill when the Government introduces it.

The draft wording, in full

Annual statement of policy costs in electricity supply

After section 16 of the Climate Change Act 2008 insert—

"16A Annual statement of policy costs in electricity supply

(1) It is the duty of the Secretary of State to lay before Parliament in respect of each year, beginning with the year 2026, a statement containing the following information.

(2) For each relevant scheme, the statement must state the amount paid in the year by or on behalf of electricity consumers in Great Britain, whether through charges made by electricity suppliers, network or balancing charges, or the wholesale price of electricity.

(3) In this section "relevant scheme" means — (a) a renewables obligation imposed by an order under section 32 of the Electricity Act 1989; (b) feed-in tariffs under arrangements made by virtue of section 41 of the Energy Act 2008; (c) contracts for difference under Chapter 2 of Part 2 of the Energy Act 2013; (d) capacity agreements under Chapter 3 of Part 2 of that Act; (e) any greenhouse gas emissions trading scheme, and carbon price support under paragraph 42A of Schedule 6 to the Finance Act 2000, to the extent reflected in the wholesale price of electricity; (f) climate change levy charged on supplies of electricity; (g) any other scheme which the Secretary of State considers adds to the cost of supplying electricity for the purpose of reducing greenhouse gas emissions.

(4) The statement must also state the Secretary of State's estimate of the amounts paid in the year for— (a) balancing the national electricity transmission system, (b) reinforcing electricity transmission networks, and (c) capacity held in reserve, that are attributable to the connection and operation of generating stations powered by wind or sunlight.

(5) The statement must— (a) state each amount in the prices of the year and in the prices of a base year stated in the statement; (b) state the value added tax charged on those amounts; and (c) identify the methods and data used.

(6) The first statement must also contain the information required by subsections (2) to (5) for each year from 2002 to 2025.

(7) The statement must be laid before Parliament not later than 30th September in the year following that to which it relates.

(8) The Secretary of State must publish, at the same time as each statement, the data and calculations used in a form that allows the amounts to be reproduced."

Contents

	Highlights	2
	About this report	7
Chapter 1	**The strongest case**	8
Chapter 2	**The two bills**	10
Chapter 3	**The answer**	13
Chapter 4	**Why it costs more**	15
Chapter 5	**How sure**	18
Chapter 6	**What is left out**	20
Chapter 7	**What Parliament should do**	22

About this report

Independence

This report was not commissioned or paid for by anyone. Richard Lyon researched and wrote it, and he built the model that produces its figures. His wider views are set out in his book, *The Energy Trap* (Swift Press, 2026), which argues for an energy policy based on physics and engineering. He writes the newsletter *The State of Britain* and runs the Subsidy Clock.

The author has no financial interests in energy companies, including through any pension or fund he directs. Throughout this report, the gas-led alternative is a yardstick for measuring cost, not a proposal.

Review

The figures were checked against their sources, and a sample was checked independently. A register of claims is published with the technical paper. The technical paper is being peer reviewed. AI tools were used for research, model code and fact-checking, under the author's direction.

How to read it

This report is drawn from the technical paper *Reliable Britain: what Britain's electricity would have cost on gas*, Version 1.0, which sets out the method, every option and every source. Section marks (§), and tables and annexes named in the text, refer to the technical paper. Every figure comes from the open model, release v4-s43.

Years are calendar years. Data published by financial year (April to March) are put on calendar years by the rule each chapter states. Money is in 2024 prices, using the Office for National Statistics' CPIH index (series L522, 2015 = 100), unless marked as cash, meaning pounds as paid at the time. The basis is Great Britain; where a source covers the United Kingdom, the text says how it is scaled. Household figures divide by Great Britain's households in the same year. Each headline number is tagged **measured**, **modelled** or **labelled estimate**, as §2.8 defines them. Figures for 2025 are provisional throughout.

Chapter 1: The strongest case

Renewables did not pay for themselves on bills, even on the most generous test

The strongest case for renewables is that they lowered the wholesale price by enough to pay for their subsidies and the extra grid they need. We tested that claim on generous terms. It fails over 2002–24 as a whole, and held only in 2012 and the gas crisis of 2021–23.

The claim

Wind and solar output depends on the weather, so an energy system built on them needs a second energy system for when the wind does not blow: **two energy systems**, one for when it does and one for when it does not.

The claim is that Britain can afford two energy systems because wind and solar save fuel. Burning less gas lowers the wholesale price, by enough, it is said, to pay for their subsidies and for the extra backup, grid and balancing a weather-dependent system needs. We call this **the break-even test**: did what renewables saved on the wholesale price cover their subsidies and extra grid costs?

In plain words

The break-even test asks: did renewables lower the wholesale price by enough to pay for their subsidies and the extra grid they need?

To measure the saving, this report sets the bill Britain paid for its electricity in each year from 2002 to 2024 beside a modelled bill for the same electricity on the gas-led alternative, without the climate-policy programme; chapter 2 sets out how. The **merit order** sets the price: plants run in order of running cost, and the last plant needed sets the price for all. In the actual system, wind and solar push the dearer plant out of the merit order when they run. On the gas-led alternative, they are not there, so the price is higher. That rise is the **merit-order uplift**.

Definition

Merit order

Plants run in order of running cost, and the last plant needed sets the price for all.

Three points in the claim's favour

The test is generous to the claim in three ways:

- carbon pricing is left out of both bills;
- renewables get credit for the whole fall in the wholesale price;
- the gas-crisis years 2021–23, when they saved most, are counted.

It is a check on one claim, not an estimate of every benefit of climate policy.

What is counted

On the cost side: the subsidies (the Renewables Obligation, Feed-in Tariffs and Contracts for Difference), the extra grid, balancing and Capacity Market

costs, and generators' share of grid and balancing charges. The subsidies paid for biomass too, not only wind and solar. VAT is added on households' share, as in the headline.

On the saving side: how much lower the wholesale price was because renewables ran, leaving carbon pricing aside. Section 8 of the technical paper explains how.

The Climate Change Levy and energy-saving schemes are not part of this test. They are counted elsewhere in the £140.3bn.

Nor does the test count gas bills: by burning less gas for power, renewables also lowered the gas price for heating and industry. Counting that would not change the break-even answer (technical paper, §9.8).

The answer

No, not over 2002–24 as a whole. Renewables cost £147.4bn and saved £100.7bn, a net cost of £46.7bn before VAT. With VAT on households' share it is £47.6bn, or £1,811 per household.

Key number

£46.7bn

net cost of renewables, 2002–24, before VAT

Changing one assumption at a time, the net cost with VAT runs from £39.5bn to £60.0bn. The low end counts less of the balancing cost against renewables. The high end assumes they did less to lower the gas price itself. One further test is left out of the range, because it would put carbon pricing back into one of the two bills. Annex A of the technical paper gives it.

Almost all of the £100.7bn saving, £99.8bn, came from renewables lowering the wholesale price, both directly and by lowering the gas price itself. The rest is small.

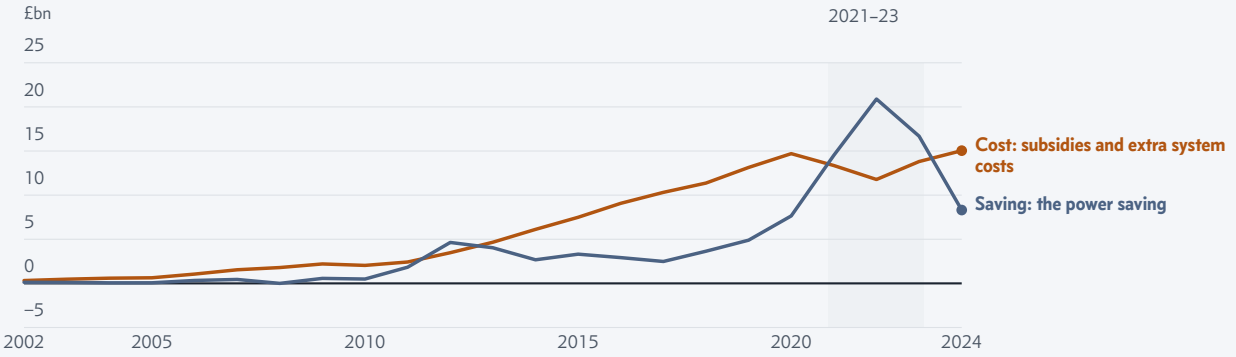
The exceptions were 2012 and, above all, the gas crisis of 2021–23. Over 2021–23 renewables saved £13.4bn more than they cost, with VAT, because the gas price, and so the price they pushed down, reached extremes.

The subsidies are money that was actually paid. The saving is an estimate: how much higher wholesale prices would have been without renewables.

Chart 1.1

The cost exceeded the saving in most years, 2012 and the crisis years 2021–23 apart

Renewables' cost bundle and the power saving, by year, before VAT, £bn, 2024 prices, 2002–24. Modelled. Shaded: 2021–23.



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

Chapter 2: The two bills

What Britain paid, against what the same electricity would have cost on gas

For every year from 2002 to 2024, we set the bill Britain actually paid beside what the same electricity would have cost on the gas-led alternative, without climate policies. The difference is the extra cost: £140.3bn.

Two bills, every year

This report takes what Britain paid for its electricity in each year from 2002 to 2024 and sets it beside what the same electricity would have cost without climate policies, on the gas-led alternative. Over 2002–24 that is £955.5bn against £815.2bn, in 2024 prices. The difference, £140.3bn, is the extra cost.

Both bills are for the same electricity: the amount Britain actually used. The bill on the gas-led alternative is an estimate, because the gas-led alternative never happened. The Government last made a comparison of this kind in 2014 (DECC 2014, para 43).

Key number

£140.3bn

extra cost, 2002–24: £955.5bn paid, against £815.2bn on the gas-led alternative. Range £120.8bn to £152.7bn.

What the gas-led alternative is

The gas-led alternative starts with the power stations Britain had in 2002 and lets them age, at the demand Britain actually had. Old coal and gas stations close at the end of their life, when pollution law requires it, or when, without a carbon price, they would not have covered their costs. The output of wind and solar is made up first by the remaining stations running harder, then by new plant: the cheapest, gas or coal fitted with pollution filters. Nuclear power, links to other countries' grids and pumped storage are as they actually were. Fuel is bought at the prices Britain really paid, 2022 included. There is no carbon price.

It keeps enough spare plant to keep the lights on to today's standard: 7.4% spare capacity, the level the National Energy System Operator (NESO) recommends. That is the standard the gas-led alternative is built to; this report makes no claim about how reliable the actual system was. Only Britain's own climate policies are taken away: the rest of the world, Europe's wind farms and the world gas market included, stays as it actually was.

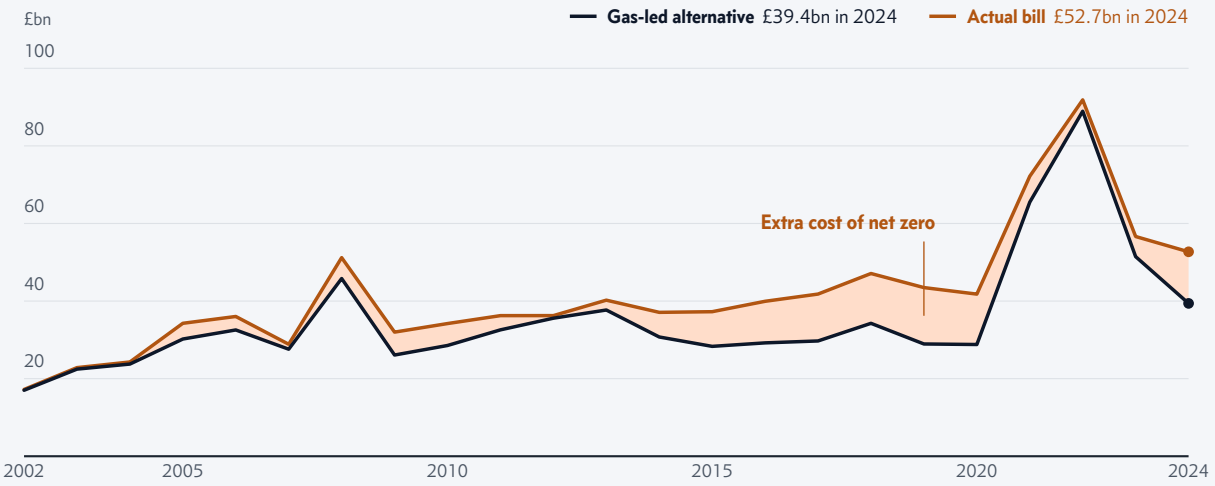
Definition

Gas-led alternative
Britain's 2002 power system, carried forward to 2024. Old plant closes, new plant is built, fuel is bought at real prices, and 7.4% spare capacity is kept.

Chart 2.1

In every year from 2002 to 2024 the bill Britain paid was above the bill on the gas-led alternative

Two full bills, £bn a year, 2024 prices, 2002–24. The shaded band is the extra cost.



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

Why 2002, and not a later year

A critic may say that a system frozen in 2002 is a straw man, and ask why the comparison does not start later, in 2008, when the Climate Change Act was passed. The gas-led alternative is not frozen: it closes old plant, builds new plant, pays the fuel prices Britain really paid and meets today's standard for spare capacity. It starts in 2002 because in 2002 it was the system Britain had; the climate policies are what changed (§2.2). The Renewables Obligation began in April 2002.

What counts as climate policies

Climate policies, in this report, are:

- the subsidies for renewable power: the Renewables Obligation, Feed-in Tariffs and Contracts for Difference;
- the carbon charge in the power price, from the emissions trading schemes and Carbon Price Support;
- the extra costs of grid, balancing and backup (the Capacity Market), above what the gas-led alternative pays for its own;
- two smaller levies, the Climate Change Levy and the suppliers' energy-saving schemes, counted only above their 2001 level;
- the VAT on all of these.

Section 2.3 of the technical paper lists them line by line.

This report takes no position on climate science, and it puts no value on carbon dioxide. It measures what electricity cost, and it counts the carbon charge in the price as one of those costs, like any other levy. Its level follows from the cap and the tax rate the Government chose to meet its targets. The Climate Change Committee sees carbon pricing differently, as making the

Key number

£82.9bn

of the £140.3bn extra cost is the carbon charge in the power price. Take it out if you think it shouldn't count.

All figures are modelled, for 2002–24, in 2024 prices.

polluter pay (CCC 2025a, p.116); §2.6 of the technical paper sets out both views. So the carbon charge is shown on its own: £82.9bn of the £140.3bn extra cost over 2002–24. A reader who thinks it should not count can take it out.

Why this does not clash with "bills fell"

The Climate Change Committee (CCC) found that household bills fell between 2008 and 2016:

> "Household bills in 2016 were below 2008 levels as higher prices resulting from low-carbon policies and network costs were more than offset by reductions in energy use"

Committee on Climate Change, *Energy Prices and Bills – impacts of meeting carbon budgets*, March 2017, p.7, Executive Summary

Both can be true. The Committee compares one year with a later one: 2008 with 2016. This report compares two bills in the same year, for the same electricity. Bills can fall over time and still be higher than they would have been without climate policies. Because both bills here buy the electricity Britain actually used, savings from more efficient appliances and boilers sit in both and cancel out: the gas-led alternative gets the efficient fridge too. The Committee's figure also covers gas, not electricity alone. Section 12 of the technical paper argues the choice to hold use at actual.

The technical paper sets out how the two bills are built (§4) and the eight choices a reader might dispute (§6 to §13); chapter 5 shows what each does to the extra cost.

In plain words

Bills can fall over time and still be higher than they would have been. The CCC compares 2008 with 2016. This report compares two bills in the same year.

Chapter 3: The answer

The extra cost was paid every year, and is still being paid

In 2024 Britain paid £52.7bn for its electricity, against £39.4bn on the gas-led alternative. Over 2002–24 the average household's share of the extra cost came to £2,286.

Every year, and how it grew

Without climate policies, electricity would have been cheaper in every year from 2002 to 2024. In no year did climate policies make it cheaper.

The extra cost started tiny: £0.2bn in 2002, and still under £1bn in 2004. It took off from 2014, at £6.3bn, and rose every year to £14.5bn in 2019, the highest of 2002–24.

In 2024, the latest full year, the extra cost was £13.3bn. The figures for 2025 are not yet final, so that year is kept apart from the 2002–24 total and labelled provisional. On the data so far, the extra cost in 2025 was £15.3bn.

Key number

£13.3bn

extra cost in 2024: £52.7bn paid, against £39.4bn on the gas-led alternative.

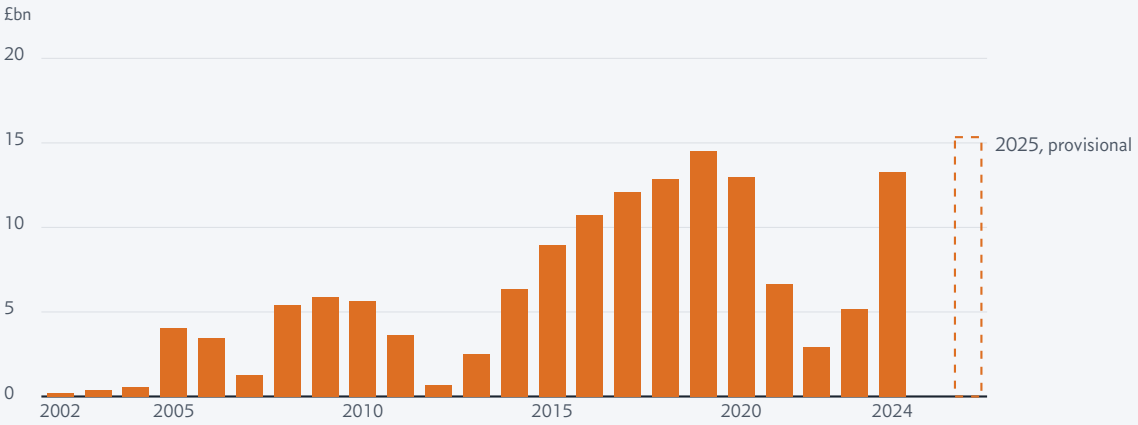
In plain words

Even in 2022, at the height of the gas crisis, climate policies still cost £2.9bn more that year.

Chart 3.1

The extra cost in each year, 2002–24

£bn a year, 2024 prices, with 2025 provisional.



Source: the author's model of Britain's electricity bills; method and data in the technical paper. The dashed bar is 2025, provisional.

The household share

Shared out, the extra cost over 2002–24 came to £2,286 for the average household; businesses and public bodies bore the rest, because they buy most of the electricity sold.

In 2024 alone, the average household's share was £197. For 2025 so far it is £223 (provisional).

Key number

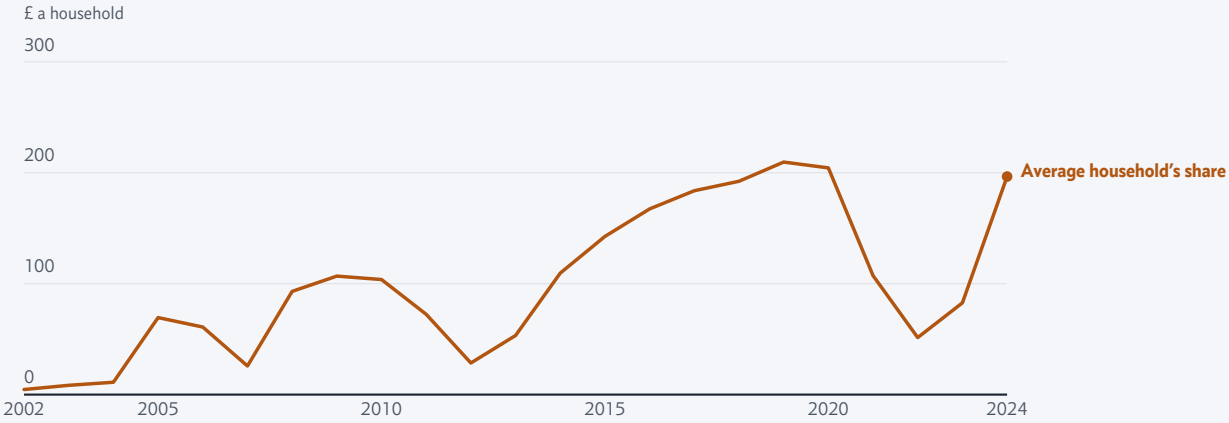
£2,286

the average household's share of the extra cost, 2002–24. Businesses and public bodies bore the rest.

Chart 3.2

The average household's share of the extra cost in each year, 2002–24

£ a household, 2024 prices. Over 2002–24 it came to £2,286.



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

Per unit

Every megawatt-hour of electricity billed cost £19.9 per MWh more on average over 2002–24. In 2024 it cost £50.8 per MWh more, well over twice the average. For 2025 so far it is £57.9 per MWh (provisional).

Definition

Megawatt-hour (MWh)
An amount of energy. It would run a one-bar electric fire for 1,000 hours, about six weeks non-stop.

How sure

Nobody can measure a bill that was never paid. So each main assumption is changed, one at a time, and the total extra cost over 2002–24 moves between £120.8bn and £152.7bn. That range is not a set of odds: no probability attaches to a judgement. Nor does it show what happens when several assumptions change at once, which is a different exercise. Chapter 5 sets out each one.

In plain words

The range is not a set of odds. It shows where the total lands if one main assumption is changed at a time.

All figures are modelled, for 2002–24, in 2024 prices. 2025 is provisional.

Carbon pricing and the cost of renewables make up most of the extra cost

Carbon pricing added £82.9bn. Renewables cost £147.4bn in subsidies and grid costs and saved £100.7bn on the wholesale price; smaller levies and VAT make up the rest of the £140.3bn.

Step by step

Chart 4.1 is a waterfall. It starts from the bill on the gas-led alternative, £815.2bn over 2002–24, adds each extra charge in turn, and arrives at what Britain paid, £955.5bn. Carbon pricing adds £82.9bn. Only £23.7bn of that was collected as tax; the rest stayed in the price of power. The subsidies and extra grid costs of renewables add £147.4bn.

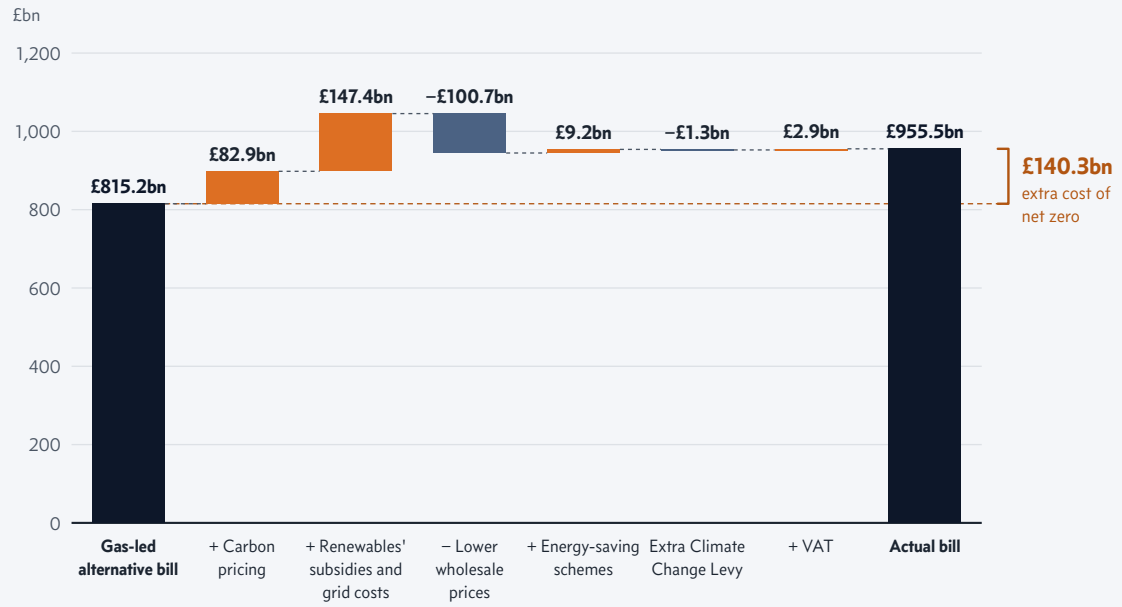
Definition

Waterfall chart
A chart that starts from one bill and adds each difference in turn until it reaches the other.

Chart 4.1

Carbon pricing and renewables' cost, less their saving, make up most of the extra cost

From the bill on the gas-led alternative to the bill Britain paid, £bn, 2002–24, 2024 prices



Source: the author's model of Britain's electricity bills; method and data in the technical paper. Bars may not add to the total because of rounding. Figure 1.1 of the technical paper shows the same total in eleven steps; it counts generators' share of grid and balancing charges in its power step, not with renewables' costs.

By lowering the wholesale price, renewables took £100.7bn back off, so on balance they added £46.7bn before VAT; chapter 1 tests whether that saving paid for them. The last steps are smaller: energy-saving schemes add £9.2bn, the Climate Change Levy, which ran below its 2001 level in real terms, takes off £1.3bn, and VAT on the bigger bill adds £2.9bn. Together these make the extra cost of £140.3bn.

Where renewables' £147.4bn went

Most of the £147.4bn went in subsidies (Table 4.1). The Renewables Obligation alone came to £85.2bn, more than half. It supported every kind of renewable power, biomass included, not wind and solar alone (chapter 1). The rest went on the extra grid, balancing and backup, above what the gas-led alternative pays for its own, and on generators' share of grid and balancing charges.

Key number

£147.4bn

what renewables cost in subsidies and grid costs, 2002–24. They saved £100.7bn on the wholesale price.

Table 4.1

Subsidies were most of renewables' £147.4bn, and the Renewables Obligation alone more than half

£bn, 2002–24, 2024 prices, before VAT

Subsidies		Grid, balancing and backup	
Renewables Obligation	£85.2bn	Extra high-voltage grid	£14.6bn
Feed-in Tariffs	£19.7bn	Extra balancing	£7.6bn
Contracts for Difference	£10.9bn	Extra backup (Capacity Market)	£0.9bn
		Generators' share of balancing charges	£4.5bn
		Generators' share of grid charges	£4.1bn
Total			**£147.4bn**

Source: the author's model of Britain's electricity bills; method and data in the technical paper. Parts may not add to the total because of rounding. *These are the extra costs over the gas-led alternative, for Great Britain, by calendar year, in 2024 prices, before VAT. The Subsidy Clock counts whole UK schemes by financial year, so its Renewables Obligation, Feed-in Tariff and network figures are higher. Contracts for Difference agree, at £10.9bn.*

How the extra cost builds up, year by year

Chart 4.2 shows how the extra cost builds up, one year at a time, in four panels that share the same years. Panel 1 shows the electricity billed each year, in terawatt-hours (TWh). Panel 2 shows the two bills: the bill Britain actually paid, the higher line in every year, and the bill on the gas-led alternative. Panel 3 shows the extra cost per unit, in pounds per MWh. Each year, the electricity billed (panel 1) times the extra cost per unit (panel 3) gives that year's extra cost, the gap in panel 2. Adding those yearly amounts together gives the running total in panel 4. It ends at £140.3bn. So the extra cost was paid in every year. Carbon pricing was the biggest single charge in 2005, at £3.3bn, in 2006 and 2008–11, and again in 2022, at £11.4bn, and 2023; from 2012 to 2021 the Renewables Obligation was.

Key number

£82.9bn

carbon pricing's part of the extra cost, 2002–24, before VAT.

One subsidy even turned negative. In 2022 Contracts for Difference came to −£0.4bn, which made the extra cost smaller that year.

Key number

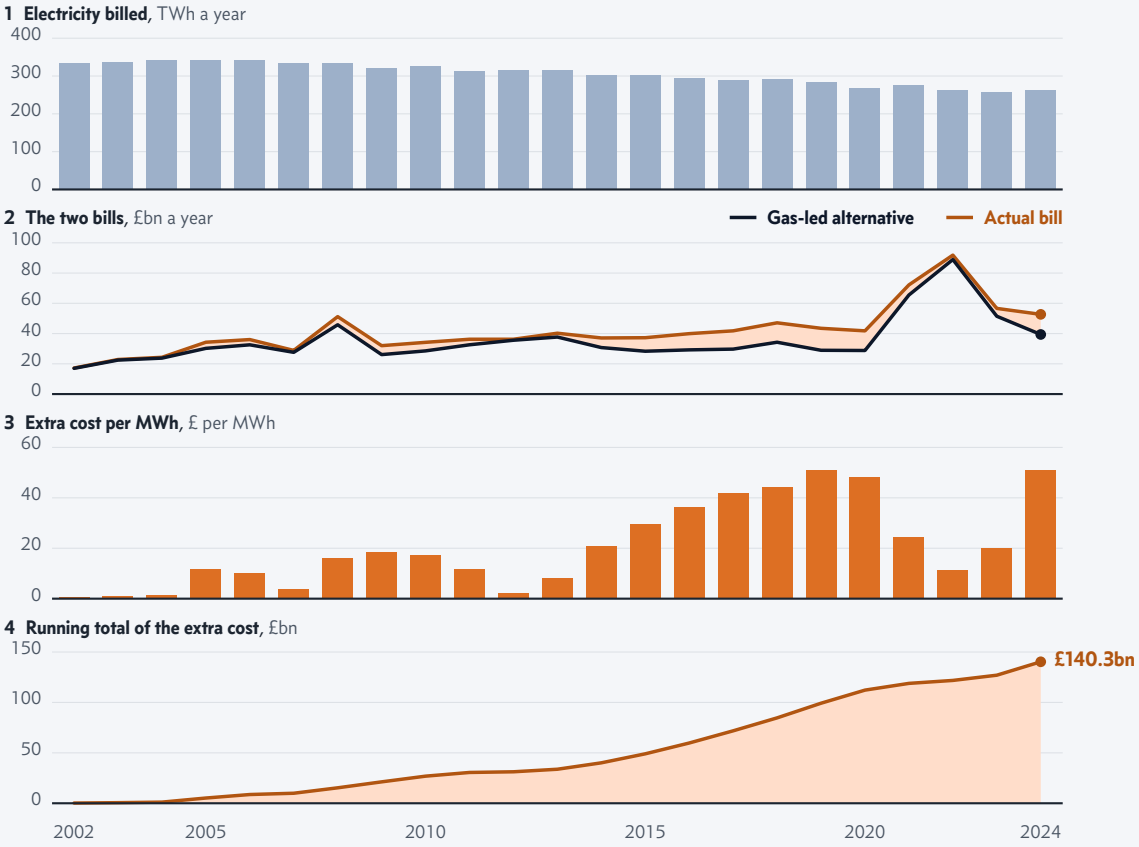
−£0.4bn

Contracts for Difference in 2022.

Chart 4.2

How the extra cost builds up, year by year

Great Britain, 2002–24, 2024 prices. The shaded band in panel 2 is the extra cost; panel 4 adds it up year by year.



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

"It's gas, not policy"

A second mainstream case holds that the rise in bills was driven by the price of gas, not by climate policy. The Climate Change Committee puts it in the same report: bills rose sharply from 2004 to 2008 "as international gas prices rose" (CCC 2017, p.7), and price pressures "have largely been driven by higher wholesale energy prices" (CCC 2017, p.14, chapter 1 key messages).

This report accepts that and builds it in. The gas-led alternative pays the actual price of gas in every month, 2022 included, plus a rise for its own extra burn, or a fall in years when it burns less gas than Britain did (chapter 5). When gas gets dearer, both bills rise, and the bill on the gas-led alternative rises more, because over 2002–24 it burns more gas. So dearer gas makes the extra cost smaller; it does not cause it. Even in 2022 the extra cost was £2.9bn (chapter 3). Gas could remove the extra cost in one way only: burning more gas, the gas-led alternative may pay more for it. Chapter 5 asks how large that would have to be for the extra cost to vanish (technical paper, §9.5 and §15.3).

All figures are modelled, for 2002–24, in 2024 prices.

Chapter 5: How sure

Changing one main assumption at a time, the extra cost stays above £120bn

Changing each main assumption on its own keeps the total extra cost over 2002–24 between £120.8bn and £152.7bn. For the extra cost to vanish in 2024, the gas-led alternative would have had to pay 95.7% more for gas than Britain did, against 17.7% more in the central estimate.

How far the answer moves

A bill that was never paid cannot be measured, so the extra cost rests on assumptions. To see how far the answer moves, each main assumption is changed on its own, with every other one left as in the central estimate. The technical paper names eight assumptions open to reasonable dispute, each with its own chapter (§6 to §13). Seven of them have another option that can be run. Across all of those options, the total extra cost over 2002–24 stays between £120.8bn and £152.7bn, around the central £140.3bn. The eighth assumption holds demand at what Britain actually used, on both bills. Its other option is not run, because two bills for different amounts of electricity cannot be fairly compared (§12). The range is not a set of odds (chapter 3).

Key number

£120.8bn to £152.7bn

the range of the extra cost, 2002–24, changing one main assumption at a time.

What sets each end

The low end comes from paying the power stations Britain had anyway the actual market price, with carbon included. That changes the extra cost by −£19.5bn. The high end comes from assuming that the gas-led alternative's extra gas burning pushes up the price of gas by less than in the central estimate. That changes it by +£12.4bn. Every other option moves the total by less, as Chart 5.1 shows.

Definition

Gas-price feedback

Burning more gas raises the price of gas itself.

The cautious rule, and the exception that sets the low end

Where the evidence leaves a choice open, the technical paper takes the sourced option that makes the extra cost smaller, and says so. It lists six exceptions, each argued in its own chapter (Table 2.1). In two of them, the option that would lower the extra cost fails a test that the central option passes. That is also why the assumptions are not all set at their lowest at once: some of those options fail tests that the central options pass, as one balancing option does (§11).

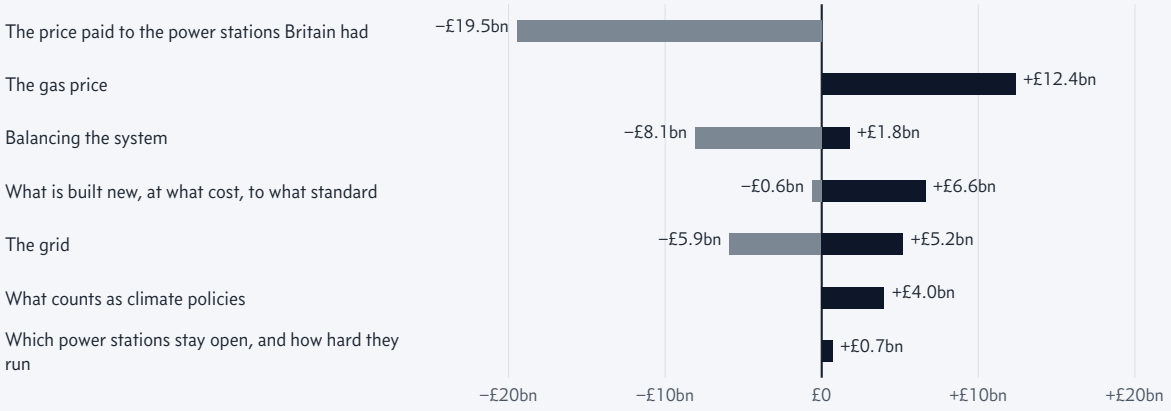
In plain words

When the evidence allows a choice, the report takes the one that makes the extra cost smaller.

Chart 5.1

The price paid to the power stations Britain had, and the gas price, set the two ends of the range

Biggest change each way to the extra cost over 2002–24 when one assumption is changed on its own, £bn, 2024 prices. Modelled. Grey bars lower it; blue bars raise it. No bar where no option moves it that way.



Source: the author's model of Britain's electricity bills; method and data in the technical paper.

One exception sets the low end of the range. The output of the power stations Britain had is valued at the gas-led alternative's price, without carbon, although valuing it at the full actual price would lower the extra cost. A critic will say that pricing nuclear output without carbon makes the extra cost bigger, which is the opposite of erring low. The answer is that there is one price in a half-hour, and on the gas-led alternative that price contains no carbon. Paying nuclear a carbon price on an alternative with no carbon price would charge it for climate policies. The full actual price is still defensible, because imported power did carry carbon prices from abroad (§2.4), so it is the low end of the range.

What it would take for the extra cost to vanish

Chapter 4 asked how much more the gas-led alternative would have to pay for gas for the extra cost to vanish. For the extra cost in 2024 to vanish, the gas price the gas-led alternative pays would have to be 95.7% higher than the price Britain actually paid. In the central estimate, its extra gas burn raises that price by 17.7% (§9.3).

Key number

95.7%

the rise in the gas price that would make the 2024 extra cost vanish, against 17.7% in the central estimate.

What the checks can show

No test can prove the extra cost, because the gas-led alternative never happened. Its bill can still be checked in the early years, when the two bills were still close, and that check passes (§5.3). Each other part of the method can be tested too: the actual bill against published statements, and the mechanisms and identities against data. The range in this chapter carries what the checks cannot. The technical paper's Annex B lists the issues still open in this version, with the size of each that has one.

Chapter 6: What is left out

What the £140.3bn leaves out, on both sides

Some costs and some savings fall outside the electricity bill. We size them where we can, show which way the rest would move the total, and add none of them in.

A cost left out: lost value

When electricity costs more, people and firms use less of it and go without things they valued. That loss, **lost value**, is extra to the bill. An estimate puts it at £9.8bn over 2002–24, in 2024 prices, in a range of £3.5bn to £12.2bn. It is not lost GDP. It is computed outside the extra cost and never added to it. The two costs add in principle and never offset, so leaving lost value out makes the £140.3bn smaller than the full cost.

Key number

£9.8bn

lost value, 2002–24, a cost on top of the bill. Range £3.5bn to £12.2bn.

A saving left out: cheaper gas for homes and industry

The gas-led alternative burns more gas, which pushes up the price of gas for everyone who buys it, homes and industry as well as power stations. So climate policies also saved money on gas bills. An estimate puts that saving at £18.2bn over 2002–24, in 2024 prices, or £9.5bn once you allow for the extra that British gas producers would have earned. This is a saving, not a cost. It falls on gas bills, not electricity bills, so it is not in the extra cost and is never taken off it (§9.8). It is the same saving that the executive summary sets beside the headline and that chapter 1 names.

Key number

£18.2bn

what dearer gas would have added to gas bills for homes and industry, 2002–24

What else is left out, and which way it would move the total

One item left out would raise the extra cost: British gas producers' response to higher prices. Leaving out the cost of local wires makes the extra cost smaller. Savings from the suppliers' energy-saving schemes would lower it, but no scheme measured them. For imports and the rule that keeps older coal out of the Capacity Market, no run or source shows which way the total would move. Others are outside the scope of a report about bills, or fall after 2024. Table 6.1 gives each, with the reason it is not counted.

Table 6.1

Items left out of the extra cost, and which way each would move it

The table holds no figures.

Item	Which way it would move the extra cost	Why it is not counted
British gas producers' response	Would raise it	Higher gas prices under the gas-led alternative might have drawn out more British gas. That would have softened the rise in the gas price. No source sizes it.
Electricity saved by the suppliers' energy-saving schemes	Would lower it	It is not credited to the gas-led alternative, because no scheme measured it. The largest official figures are estimated or forecast, not measured. No measured series exists to credit.
Local wires	Leaving it out makes the extra cost smaller	The share of distribution reinforcement that climate policies caused is not counted, because no free source gives a defensible share year by year.
Imports	Not stated	The gas-led alternative holds imports at their actual level. No run measures their response to a different price, so nobody can say which way it would move the total.
Coal's exclusion from the Capacity Market	Not stated	Older coal can no longer take part in the main Capacity Market auctions. That may have raised the price those auctions paid. No source separates the effect, so it is not counted.
Air pollution	Not stated	The gas-led alternative keeps coal plant open and burns more gas in 2011–15 and 2018–24. The costs of the extra air pollution are outside the scope of a report about bills.
Contracts for Difference after 2024	Outside the period	Payments under contracts already signed run on well beyond 2024.
Bill support	Transfers between taxpayers and bill-payers	The Energy Price Guarantee and the Energy Bills Support Scheme are left out of both bills, because the extra cost measures the cost of supply whoever paid it.
The Electricity Generator Levy	A question of who pays	It is netted off neither bill.

Source: the technical paper.

Who paid is a separate question

The two bill support schemes were transfers between taxpayers and bill-payers. They are left out of both bills, because the extra cost measures the cost of supply, whoever paid it. The Electricity Generator Levy is a question of who pays, and it is netted off neither bill. Lost output from industry moving abroad is left to a later report.

In plain words

Who paid is a different question from what it cost.

Parliament should require a yearly statement of what each climate policy adds to electricity bills

A short new section of the Climate Change Act 2008 would require a yearly statement of what each climate policy adds to electricity bills.

No official figure today says what climate policies have cost, scheme by scheme. Some of the figures the technical paper needed do not exist at all: spending on the high-voltage grid, split by what caused it, and measured savings from the energy-saving schemes.

The Climate Change Act 2008 already requires the Secretary of State to give Parliament a statement of the United Kingdom's emissions for each year (section 16). A matching duty would require a statement of what Britain pays to cut them. Draft wording for a new section 16A follows.

Annual statement of policy costs in electricity supply

After section 16 of the Climate Change Act 2008 insert—

"16A Annual statement of policy costs in electricity supply

(1) It is the duty of the Secretary of State to lay before Parliament in respect of each year, beginning with the year 2026, a statement containing the following information.

(2) For each relevant scheme, the statement must state the amount paid in the year by or on behalf of electricity consumers in Great Britain, whether through charges made by electricity suppliers, network or balancing charges, or the wholesale price of electricity.

(3) In this section "relevant scheme" means— (a) a renewables obligation imposed by an order under section 32 of the Electricity Act 1989; (b) feed-in tariffs under arrangements made by virtue of section 41 of the Energy Act 2008; (c) contracts for difference under Chapter 2 of Part 2 of the Energy Act 2013; (d) capacity agreements under Chapter 3 of Part 2 of that Act; (e) any greenhouse gas emissions trading scheme, and carbon price support under paragraph 42A of Schedule 6 to the Finance Act 2000, to the extent reflected in the wholesale price of electricity; (f) climate change levy charged on supplies of electricity; (g) any other scheme which the Secretary of State considers adds to the cost of supplying electricity for the purpose of reducing greenhouse gas emissions.

(4) The statement must also state the Secretary of State's estimate of the amounts paid in the year for— (a) balancing the national electricity transmission system, (b) reinforcing electricity transmission networks, and (c) capacity held in reserve, that are attributable to the connection and operation of generating stations powered by wind or sunlight.

(5) The statement must— (a) state each amount in the prices of the year and in the prices of a base year stated in the statement; (b) state the value added tax charged on those amounts; and (c) identify the methods and data used.

(6) The first statement must also contain the information required by subsections (2) to (5) for each year from 2002 to 2025.

(7) The statement must be laid before Parliament not later than 30th September in the year following that to which it relates.

(8) The Secretary of State must publish, at the same time as each statement, the data and calculations used in a form that allows the amounts to be reproduced."

Table 7.1

Each part of section 16A matches something this report had to work out

Subsection	What it requires	Not published today, so this report had to work it out
(2)	The amount paid each year for each scheme by or on behalf of electricity consumers in Great Britain.	The amount for each scheme: Chapter 4, Table 4.1 and Chart 4.1.
(3)	The schemes it covers.	Which schemes count: the climate policies defined in Chapter 2.
(4)	The balancing, grid and backup costs caused by wind and solar.	The balancing, grid and backup costs of wind and solar: estimated in Chapter 4.
(5)	Each amount in the year's prices and a base year's, with its VAT and its methods.	Prices and VAT: Chapters 2 and 4.
(6)	The same for each year from 2002 to 2025, in the first statement.	Every year from 2002, with 2025 provisional: Chapter 3.
(8)	The data and calculations, published so the amounts can be reproduced.	The data and calculations: the open model (About this report).

Source: draft section 16A above; the technical paper.

The strongest objection

The strongest objection is that the duty would be a costly burden, and that an official estimate of what bills would have been without climate policies, for every year back to 2002, would be argued over and drawn into politics. The answer has three parts. The Department of Energy and Climate Change (DECC) produced such estimates for years, so the work can be done. Section 16 already requires the matching statement on emissions. And subsection (8) lets anyone check the figures, so any argument about them would happen in the open.

An existing body shows how such a duty can be met. By law, the Office for Budget Responsibility must "examine and report on the sustainability of the public finances" (Budget Responsibility and National Audit Act 2011, s.4(1)). It has "complete discretion" in how it does so, within limits the Act sets (s.5(1)). It "must perform that duty objectively, transparently and impartially" (s.5(2)), and it "may not consider what the effect of any alternative policies would be" (s.5(3)(b)).

Who decides, and when

The Bill the new section could be added to is the Energy Independence Bill. The King's Speech of 13 May 2026 said: "My Ministers will therefore introduce an Energy Independence Bill" (GOV.UK, "The King's Speech 2026", www.gov.uk/government/speeches/the-kings-speech-2026). The Government answered on 28 July 2026 that "The Bill will be introduced as soon as parliamentary time allows" (Lords written question HL2076), and on 15 September 2026 that its scope and content "will be set out in due course when it is introduced to Parliament" (Commons written question 27409, Department for Energy Security and Net Zero). A search of Parliament's list of bills on 21 October 2026 did not find it. The new section could be offered as an addition to that Bill, or as a private member's bill.

Where the evidence is

The technical paper gives the method, every option and every source; its Supplementary Note lists each release figure with its key; and the open model release rebuilds every figure from its code and data. This report's register of claims is published with it.

Corrections: corrections@richardlyon.net

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Photograph on the highlights page: the Aust pylon of the Severn power line crossing, England, by Adrian Pingstone (September 2010), public domain, via Wikimedia Commons.
Report No. 1, version 1.0.2, 26 October 2026. Drawn from the technical paper, version 1.0.
Version 1.0.2 corrects one sentence on p.17 that left out how the gas-led alternative's own gas burn moves the price it pays, and the p.18 heading, which went beyond changing one assumption at a time. Version 1.0.1 corrected one sentence on p.17, which had the effect of gas prices the wrong way round, and clarified the VAT basis of figures on pp.9 and 16 and the years carbon pricing led on p.16. No figure changes.