CAMPAIGN TO ELECTRIFY BRITAIN'S RAILWAY

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Oil price crisis impact on GB rail operators

June 2026

Analysis that estimates the potential financial impact of the price increase of diesel traction fuel for rail operators in Great Britain, and the savings available from network electrification, following the impact of the war on Iran on the global oil price.

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Summary

Although a large-scale programme of rail electrification is known to be required to achieve Net Zero targets and boost network capacity to meet rising UK demand for rail travel, investment in rail electrification has been neglected by successive governments, and progress outside Scotland has now ground to a halt.

This has left much of the British rail network reliant on diesel traction power, and heavily exposed to international oil price shocks such as the one underway now as a result of the US-Israel war on Iran. Diesel consumption on GB railways has actually been rising in recent years. Franchised passenger trains used 423 million litres of diesel for traction in 2024-25 - 10% more than in 2022-23 - while the vast majority (over 97%) of UK rail freight remains diesel-powered.

The closure of the Strait of Hormuz is estimated to have removed around 20% of global oil and gas supply, sending crude oil prices soaring at the start of the 2026-27 financial year. Red diesel (aka 'gas oil' or Class A2) prices in the UK have followed, peaking in early April 2026 at 123.7p per litre. The UK average price of red diesel in May 2026 was 112.41p per litre - 53% higher than in May 2025.

The consensus amongst oil industry analysts is that these elevated prices are not likely to reduce in the near term. If May 2026 prices persist throughout the 2026-27 financial year, CEBR estimates that:

- the rail industry will be facing 38.4% higher diesel fuel costs compared with 2024-25, and;
- an annual diesel bill for passenger services alone that has climbed to over £475 million.
- In total, diesel costs will be £132 million more than last year's bill for the same number of vehicle kilometres - costs that will ultimately fall on passengers and taxpayers.
- This would represent a ten-year high in diesel spending by passenger train operators, as well as in the price-per-km being paid for diesel traction in the UK.

UK industrial electricity prices are also expected to remain at record high levels, following steep increases as a result of Russia's invasion of Ukraine in 2022, and UK wholesale electricity prices remaining pegged to the price of gas. The price per kilowatt-hour being paid by passenger train operators in 2024-25 was nearly double the per-kilowatt-hour (kWh) price of traction electricity in 2015-16.

Nevertheless, CEBR estimates that Britain's railways' continued reliance on diesel for traction will cost over £159.4 million more in 2026-27 than we would expect to spend on traction power for the same passenger services on a fully electrified network. The UK's per-passenger-vehicle kilometre costs for diesel traction are now one third higher than for electric traction. This figure is exclusively for the direct costs of traction energy. It is well known that electric railways have lower costs across a wide range of metrics so the full lifecycle 'TotEx' savings of electrification would be far higher[1], but these savings are outside the scope of this analysis.

The Midlands Main Line (MML) is a major freight and passenger corridor linking the cities of Leicester, Nottingham, Derby and Sheffield to London, and carries over 11% of all rail freight traffic on Great Britain's railways, as well as over 11% of all passenger vehicle kilometres travelled under diesel traction on the national network. Electrification of the MML has been committed to by successive UK governments in 2012, 2015 and 2021, but each time subsequently 'paused' - most recently in 2025 by the new Labour government.

If this electrification work had been completed to Sheffield by late 2020 as planned, over £65.5 million would already have been saved on traction energy costs in the East Midlands by April 2026. The new diesel price highs mean the ongoing strategic failure to electrify the MML will lead to an additional £18 million in passenger rail traction energy costs in 2026-27 alone.

As the UK government embarks on a drive to 'get Britain off the rollercoaster of fossil fuel markets and onto clean homegrown power', it is vital that our railways are included in the new imperative to electrify Britain[2].

[1] RIA (2021) Why Rail Electrification? https://www.ceca.co.uk/wp-content/uploads/2021/04/Print-WRE-Report-FULL.pdf
[2] DESNZ (June 2026) Energy security, jobs and investment boost through climate action https://www.gov.uk/government/news/energy-security-jobs-and-investment-boost-through-climate-action

Analysis

Method

Data sources

The Office of Rail and Road (ORR) is the regulator for the UK's rail industry. ORR compiles and publishes regular statistical releases on Rail Finance, Usage, Environment, Infrastructure & Assets and more, sourced primarily from Network Rail and franchised Train Operating Companies (TOCs). The data analysed for this report is largely sourced from the March 2026 ORR statistical release, alongside some bespoke tabulations compiled at our request during correspondence with ORR statisticians and shared during May 2026.

The analysis also uses data from the Department for Energy Security & Net Zero's March 2026 energy prices statistical release; Network Rail Regulatory Financial Statements back to 2015-16; a Freedom of Information Request to Network Rail for average Electric Current for Traction (EC4T) tariff rates charged to operators; Network Rail letters fixing EC4T tariff rates for certain classes of operator; and the 05/06/26 update of the Agriculture and Horticulture Development Board (ADHB) monthly average red diesel price tracker.

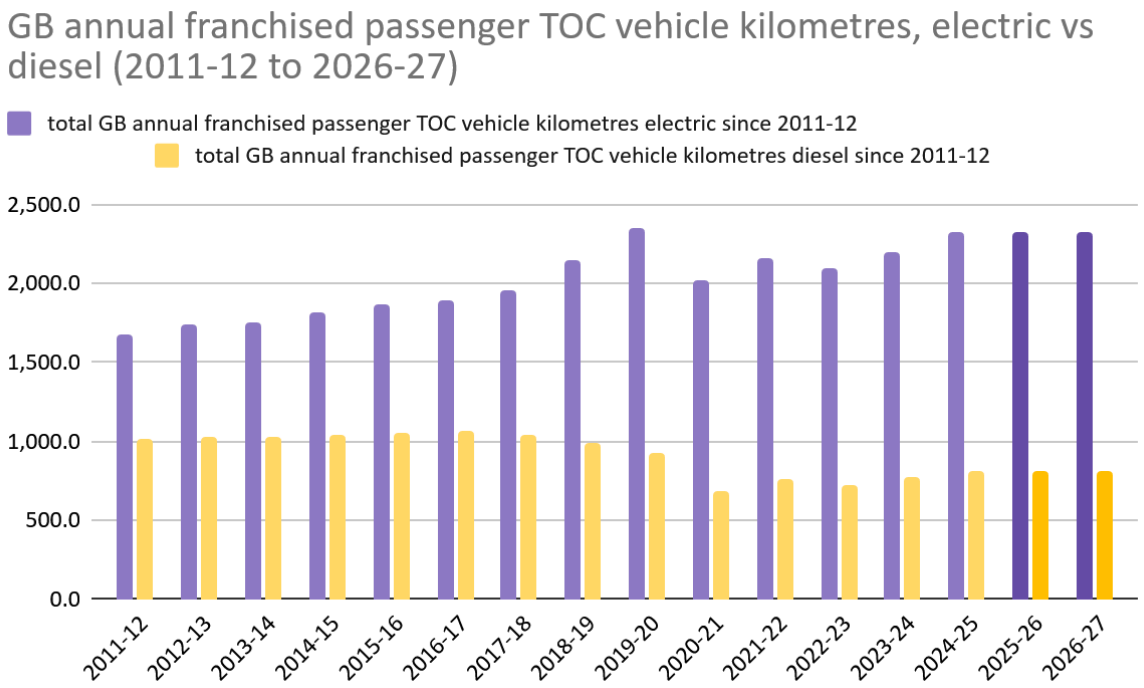
Approach

We used reported data from the regulator to calculate historical per-vehicle-kilometre costs for diesel versus electric traction. We then used these values to explore a counterfactual scenario in which all passenger train movements are powered by electric traction instead of diesel, including looking at the cost savings that would have been achieved if Midland Mainline electrification had been completed on schedule instead of being repeatedly paused. We also looked at contemporary market prices for red diesel and electricity for industrial consumers, and projected the additional costs facing diesel train operators over the rest of the 2026/27 financial year if these high prices were to persist.

Full methodology is available in Appendix A.

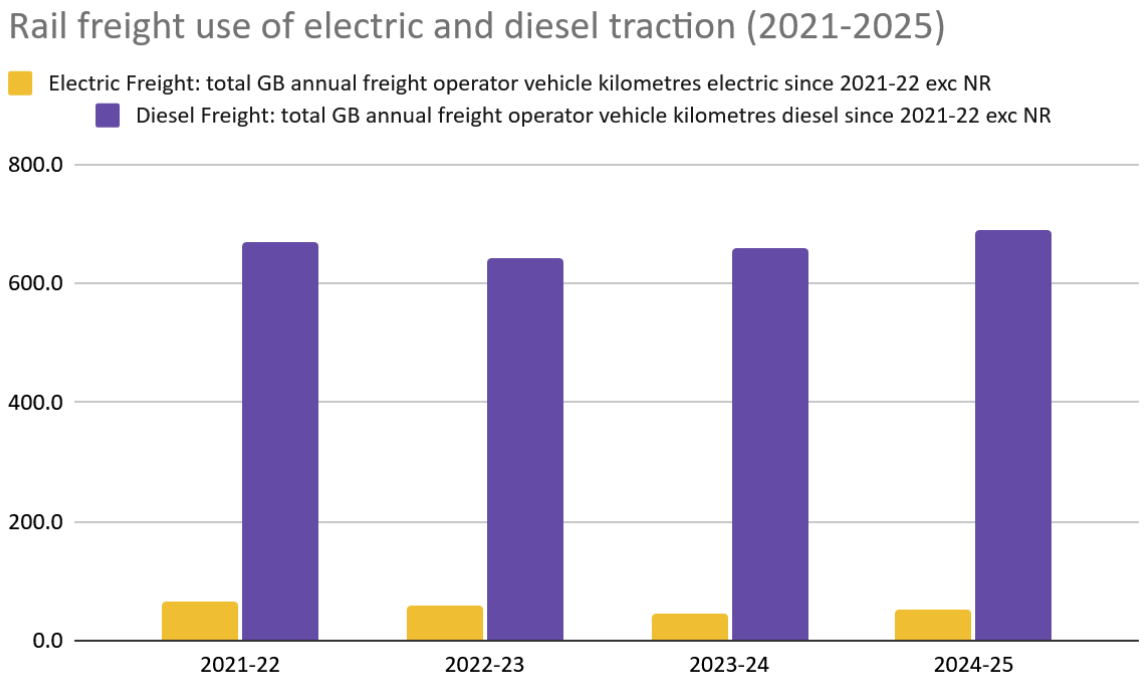
Results

Figure 1: GB annual franchised passenger TOC vehicle kilometres, electric vs diesel, (2011-12 to 2026-27).



The final two years in the graph in figure 1 are estimates based on 2024-25 mileage. Diesel passenger train mileage fell sharply during covid-19 after years of flatlining, but increased again after 2022-23. Electric passenger train mileage had been slowly climbing prior to covid-19, and has now recovered to roughly pre-covid levels.

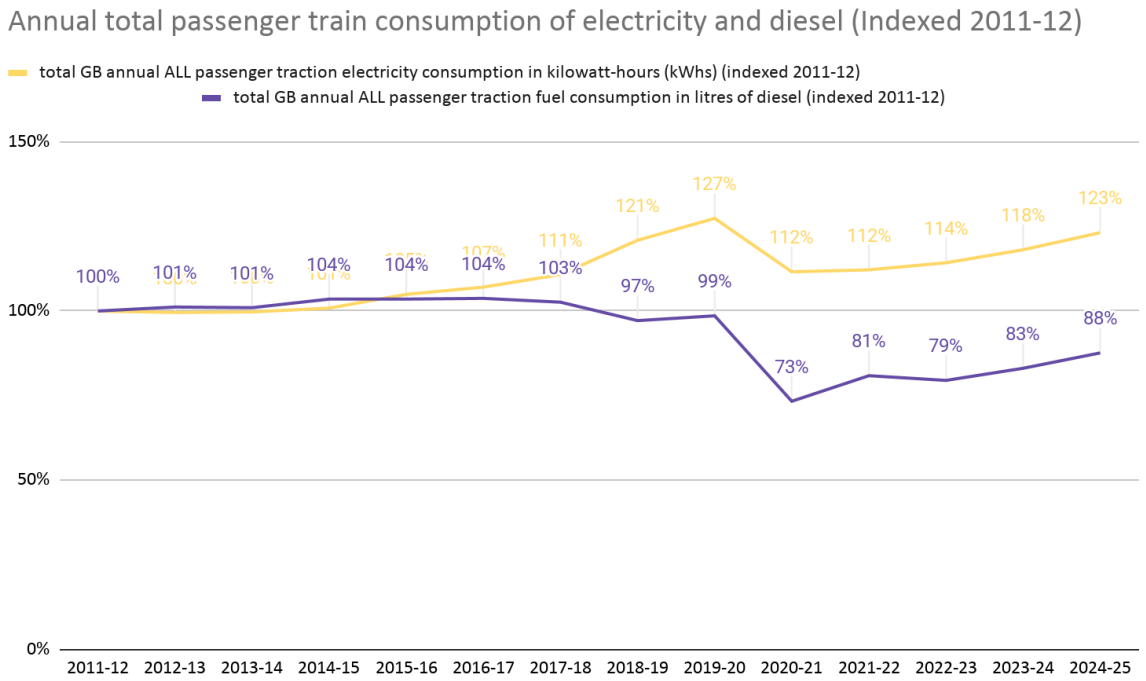
Figure 2: GB annual freight operator vehicle kilometres, electric vs diesel, (2021-2025), excluding Network Rail.



Very little progress is being made on electrifying freight trains in the UK. Rail freight movements tend to comprise long journeys through multiple regions using different lines at different stages. This means that electrifying rail freight relies on the full electrification of strategic freight corridors through the GB rail network. For some of the highest traffic freight routes, all that is needed to enable a switch from diesel is a kew kilometres of 'infill' electrification[3].

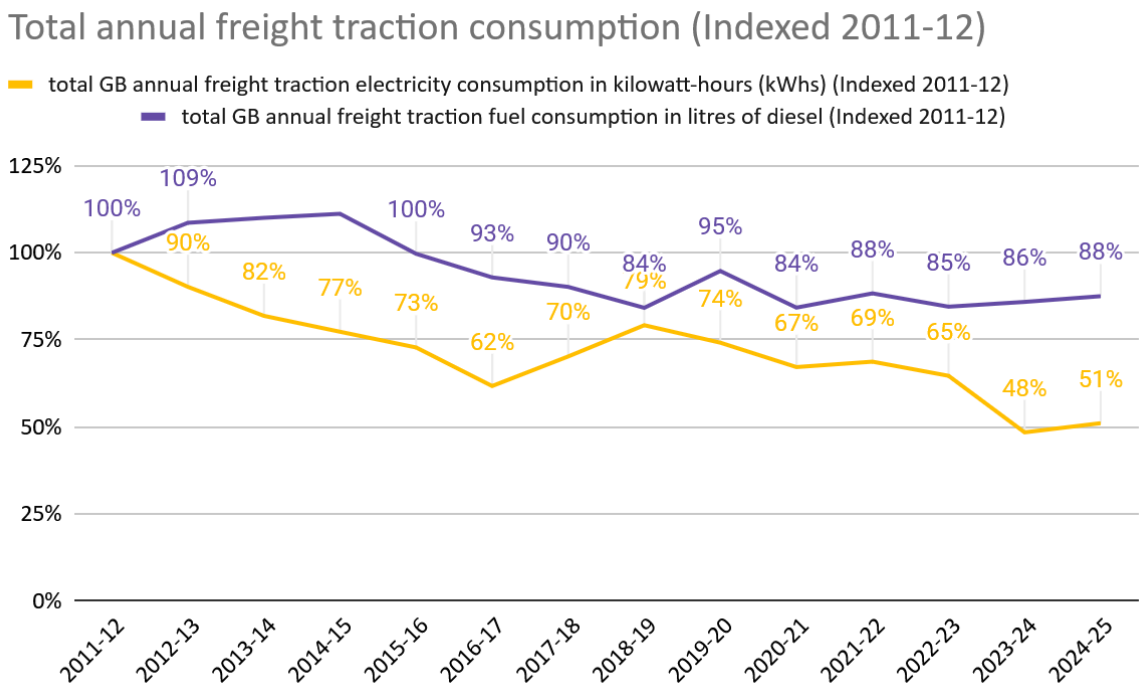
[3] CILT (2023) *Rail electrification possible for 95% of UK freight trains, CILT(UK) research reveals* https://ciltuk.org.uk/news/202303/rail-electrification-possible-for-95-of-uk-freight-trains-cilt-uk-research-reveals/

Figure 3: Total GB annual ALL passenger traction electricity consumption in kilowatt-hours (kWhs) and fuel consumption in litres of diesel (2011-2025).



Around ten years ago, passenger traction electricity consumption began to rise more sharply (with new route electrification coming onstream) while diesel consumption began to fall, but diesel consumption has been rising again since 2022.

Figure 4: Total GB annual freight traction electricity consumption in kilowatt-hours (kWhs) and fuel consumption in litres of diesel, (2011-2025)



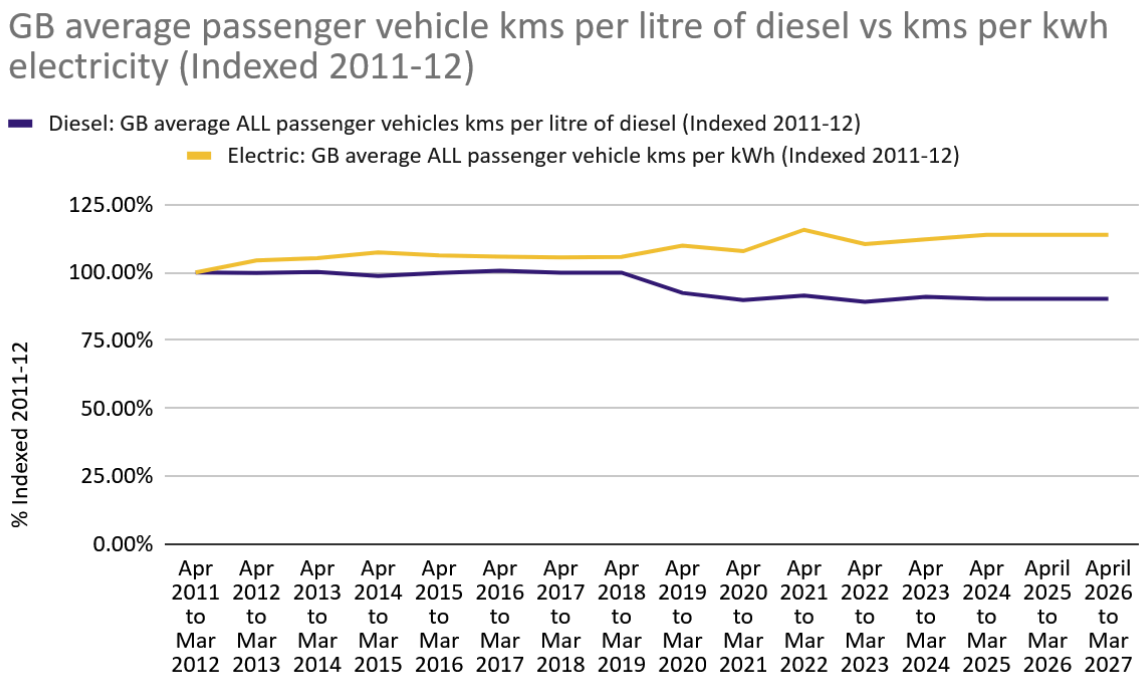
One of the most damning illustrations of Britain's problems with rail electrification is the finding that consumption of electricity by rail freight using the GB network is now just half what it was 15 years ago. This is a result of both an overall reduction in rail freight traffic in the first ten years of this period, and also of a preference for diesel traction following steep hikes in industrial electricity prices from 2022-23.

Overall reductions in rail freight traction energy consumption have been accompanied by large increases in HGV movements on our road network. Decarbonisation of freight in the wider UK economy requires both modal shift from road to rail, and electrifying of the key freight corridors on the rail network[4].

No progress is currently being made on either of these requirements.

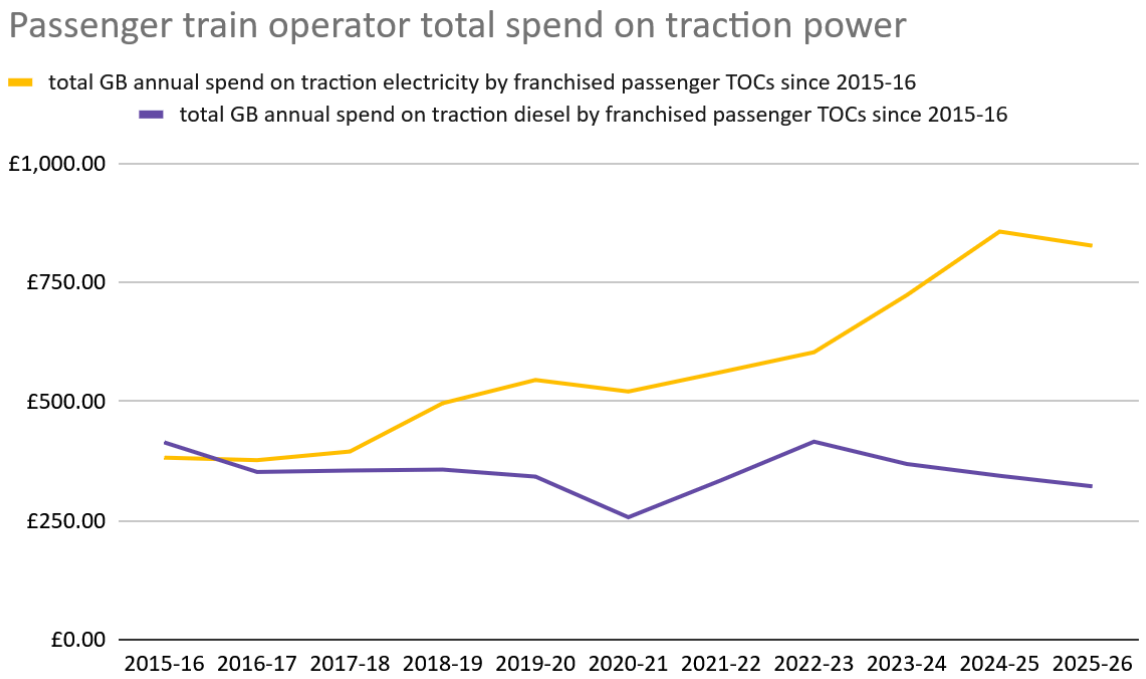
[4] Transport Select Committee (2021) *Trains fit for the future? Inquiry report* https://publications.parliament.uk/pa/cm5801/cmselect/cmtrans/876/87608.htm

Figure 5: GB average ALL passenger vehicle kms per kWh and per litre of diesel, since 2011-12



The trends are clear here: passenger trains using electricity for traction have become more efficient over the past 15 years, while those using diesel for traction have become less efficient. Operators get more kms out of a kWh of electricity than they did in 2011, but fewer kms out of a litre of diesel.

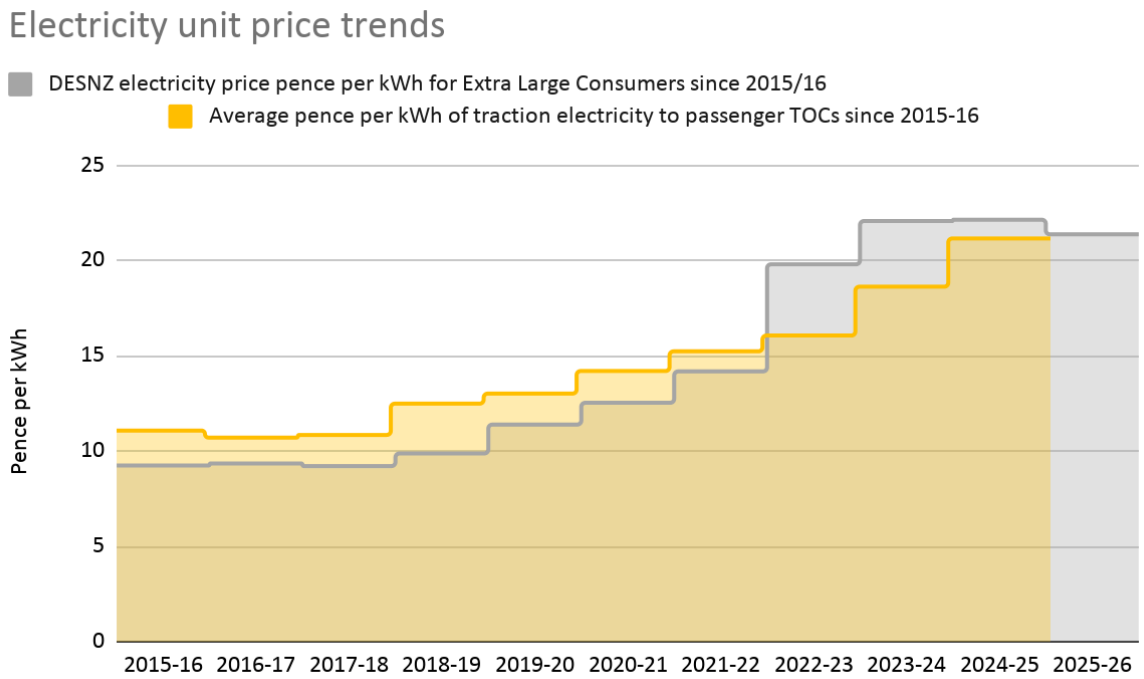
Figure 5: Total GB annual spend (£ millions) on traction electricity and diesel fuel by franchised passenger TOCs, (2015-2026)



Passenger operators spent around twice as much on traction electricity in 2025-26 than they did a decade before, despite travelling only 25% further under electric traction, and consuming just 17.3% more electricity.

This is predominantly due to the spike in electricity prices resulting from Russia's invasion of Ukraine and the long term impact on gas prices, which in the UK also tend to set the price of electricity in the wholesale market. Costs for rail operators increased later than for other industrial consumers in the UK thanks to successful hedging strategies (see below).

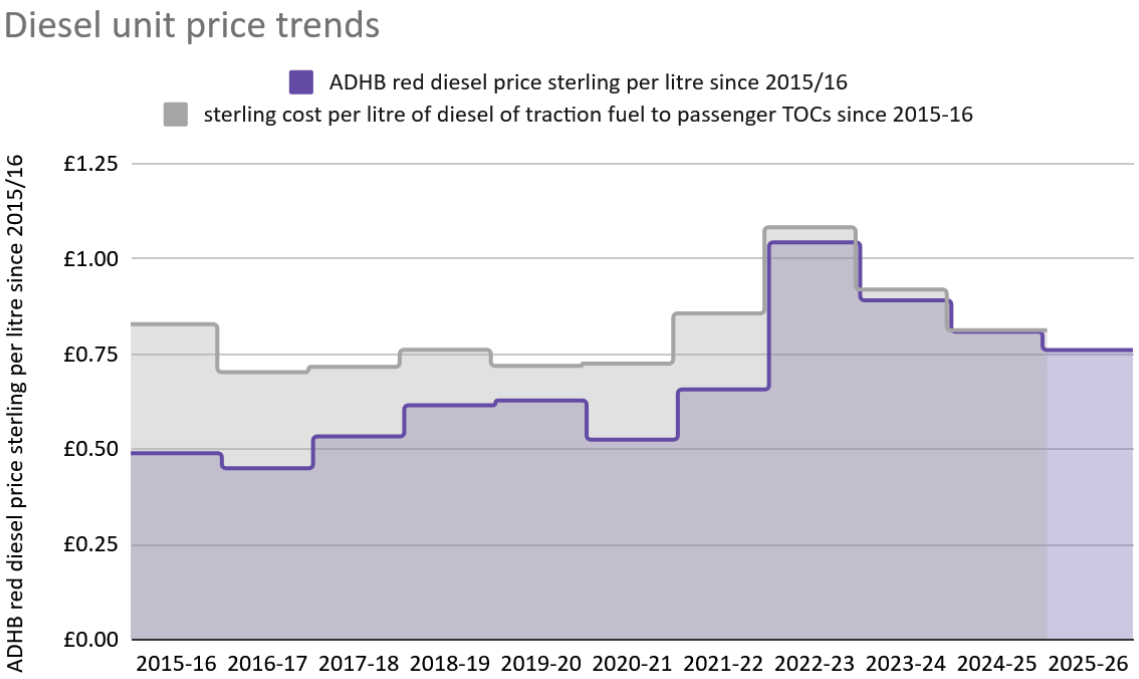
Figure 6: average cost per kWh of traction electricity to passenger TOCs vs DESNZ electricity price pence per kWh for Extra Large Consumers, (2015-2026)



Although electricity prices in the wider economy peaked in 2022-23, large electricity users like TOCs hedge against price volatility, and many TOCs secured supply contracts early on in CP6 which successfully locked in per kWh rates until the end of the Control Period. Full exposure to market prices therefore only arose for rail users in April 2024, after these had begun to fall[5].

[5] NR (Oct 2025) Network Rail Infrastructure Limited Regulatory Financial Statements, Year ended 31 March 2025 https://www.networkrail.co.uk/wp-content/uploads/2025/10/NRIL-Regulatory-Financial-Statements-2025.pdf

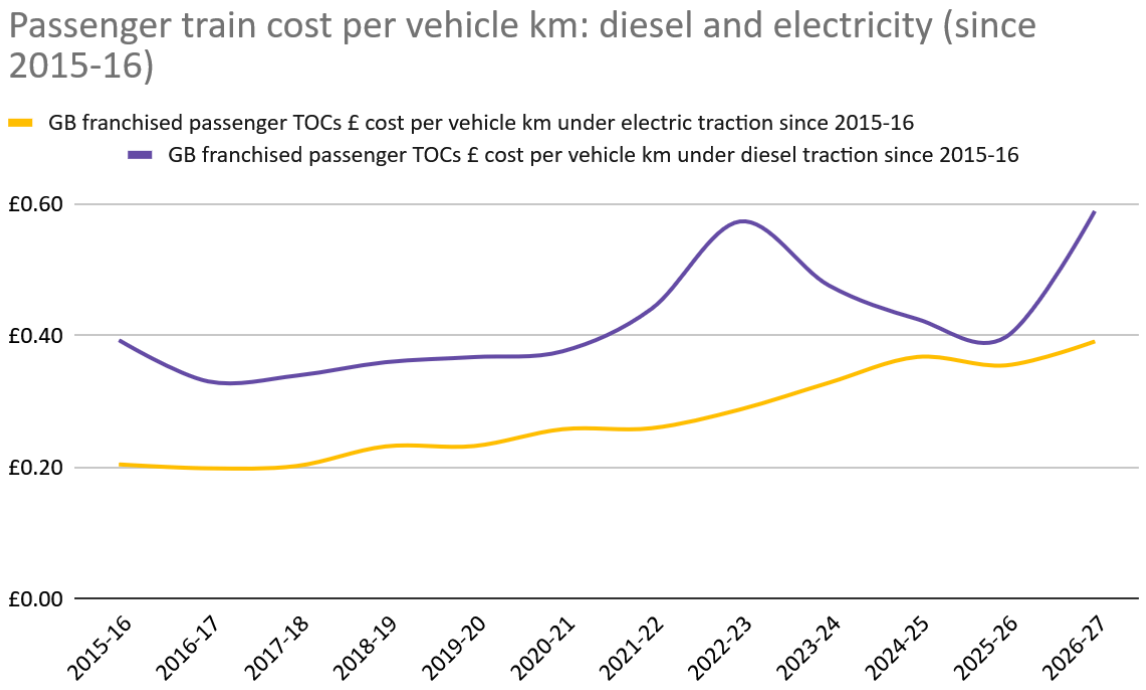
Figure 7: cost per litre of diesel of traction fuel to passenger TOCs vs ADHB red diesel price pence per litre, since 2015-16



Whilst the records indicate that TOCs have historically paid slightly above market rates for red diesel in the UK, prices have converged in the last four years. Therefore the Agriculture and Horticulture Development Board's (ADHB) monthly average red diesel price tracker should be a reliable proxy for the price being paid by train operators in 2026-27.

Because of the tax subsidies it enjoys, red diesel supply is heavily regulated in the UK. Less stock is held compared to pre-2022 restrictions, and it is much more exposed to market turbulence and price fluctuations than standard forecourt white diesel.

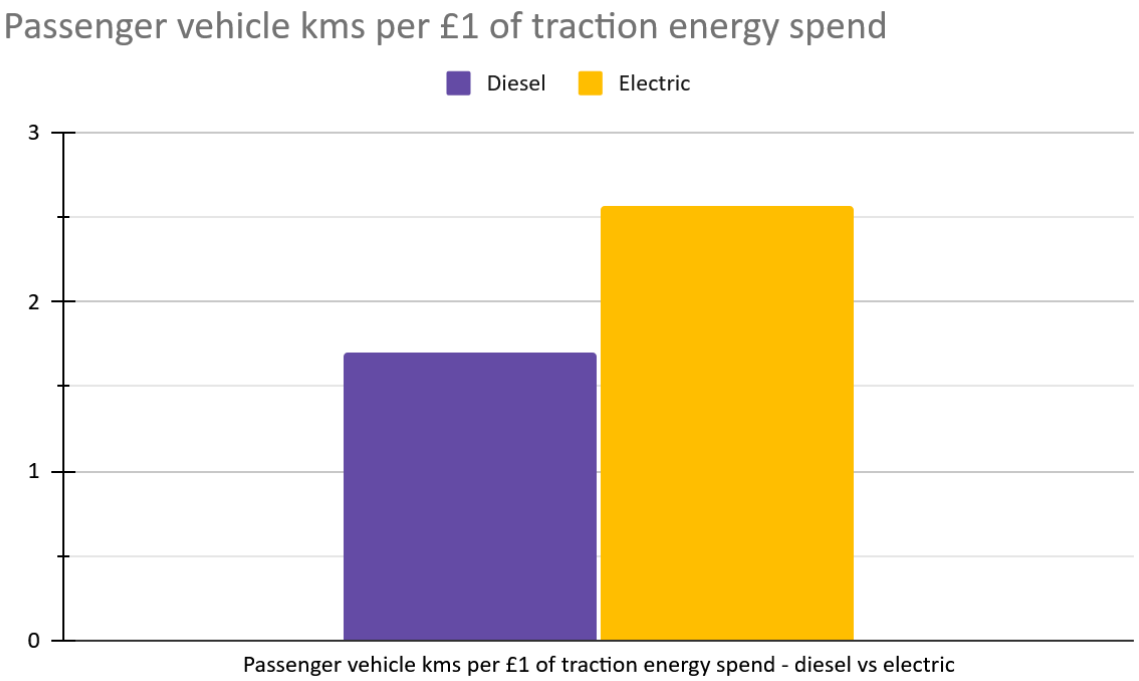
Figure 8: GB franchised passenger TOCs £ cost per vehicle km under diesel vs electric traction (2015-2027)



While electric traction has suffered a long term trend that has seen its costs per vehicle kilometre double over the last ten years, diesel traction in 2026-27 is projected to be 50% more expensive per vehicle kilometre than in 2025-26 - a scale and speed of increase which will be experienced as a price shock by operators.

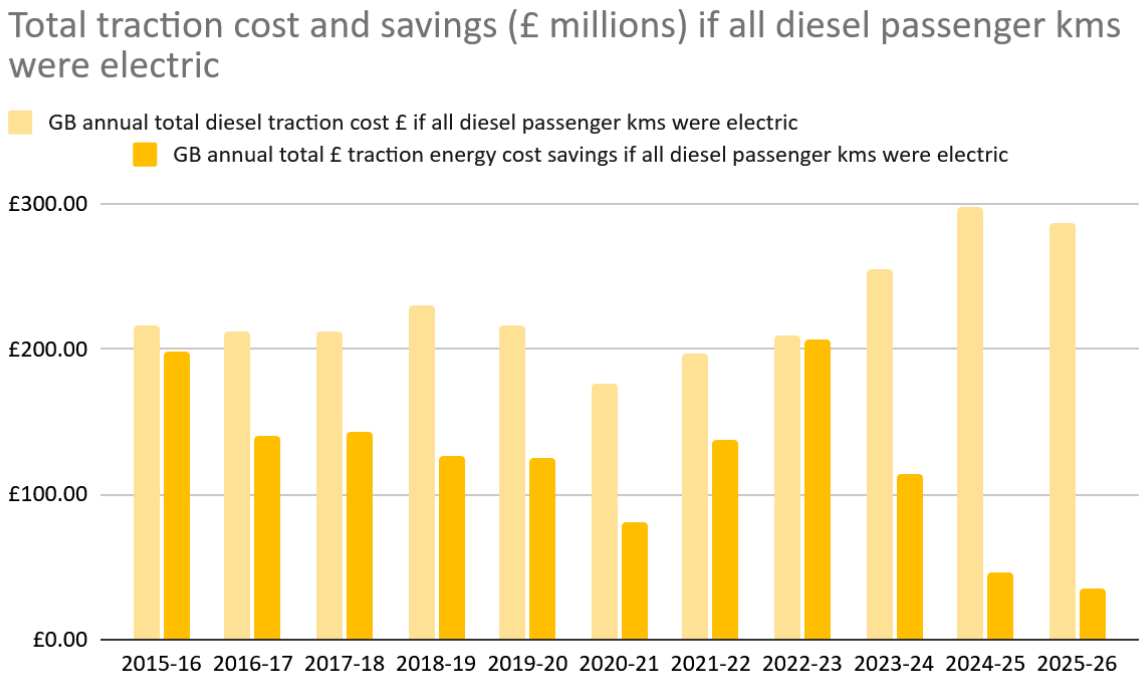
It is notable that at no time in the last decade has *energy* cost per passenger vehicle km been higher for electric traction than for diesel. There are a range of other non-commodity costs which affect the relative costs of electric vs diesel traction, but most of these favour electricity.

Figure 9: Passenger vehicle kms per £1 of traction energy spend - diesel vs electric.



Passengers trains literally travel a third further than diesel trains for the same spend on traction energy, even with electricity at record high prices in 2026-27.

Figure 10: GB annual total traction energy cost savings (£ millions) if all diesel passenger kms were electric.



Using per-vehicle-km costs for diesel vs electric traction derived from the figures reported to the regulator allows us to calculate the traction energy costs in a counterfactual scenario in which Britain, like India and Switzerland, had achieved a fully electrified railway network.

Headline savings, electric vs diesel traction

- **£1.35 BILLION**

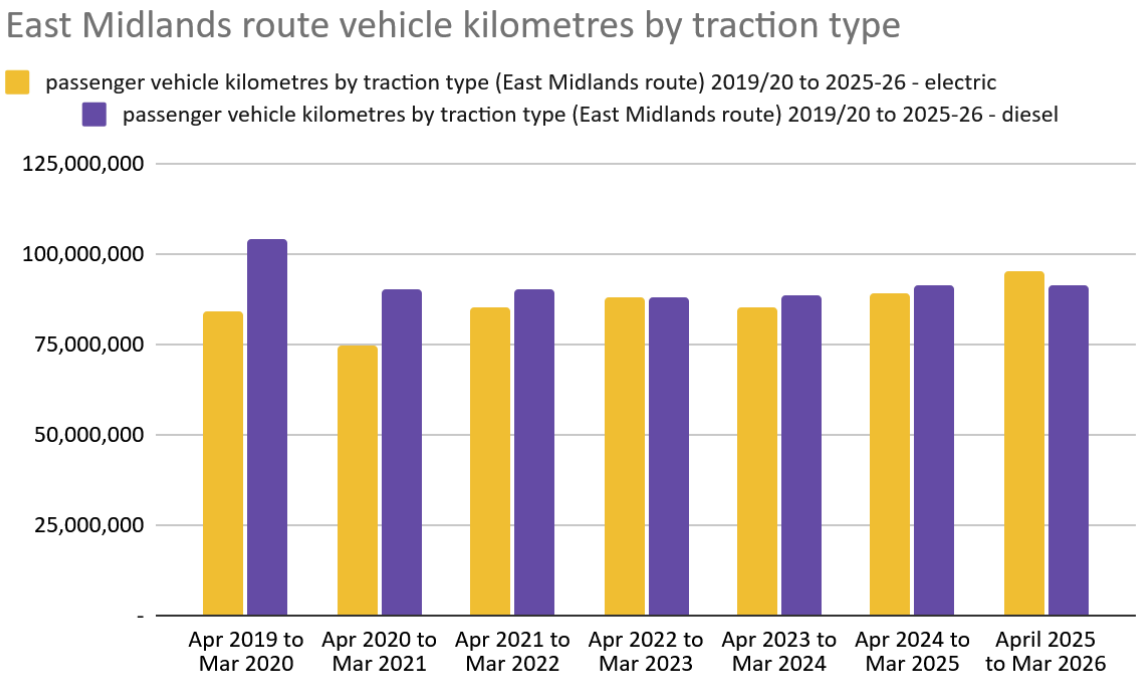
Cumulative GB passenger traction energy cost savings 2015-16 to 2025-26 under full electrification.

- **£159 MILLION**

2026-27 GB passenger traction energy cost savings under full electrification.

Midland Main Line

Figure 11: passenger vehicle kilometres by traction type (East Midlands Route) 2019/20 to 2025-26 - electric vs diesel



The East Midlands Route is dominated by the Midland Main Line (MML), and is stuck with roughly equal volumes of electric and diesel traction journeys thanks to successive decisions by governments that have committed to electrify the MML, and then reneged on this commitment. As can be seen in figures 12 and 13, this high-traffic Route carries around 11% of both all diesel passenger vehicle kilometres, and all freight tonne kilometres on the GB rail network.

Electrification of this key corridor, serving a number of important cities with large populations, and playing an utterly central role in British rail freight logistics, has been repeatedly identified as a strategic network priority since 1979[6].

[6] British Rail (1979) *RAILWAY ELECTRIFICATION: A British Railways Board discussion paper* https://www.railwaysarchive.co.uk/documents/BRB_ElectrificationDisc1978.pdf

Figure 12: East Midlands Route share of total GB rail passenger vehicle kms under diesel traction, 2024-25: ***11.07%***

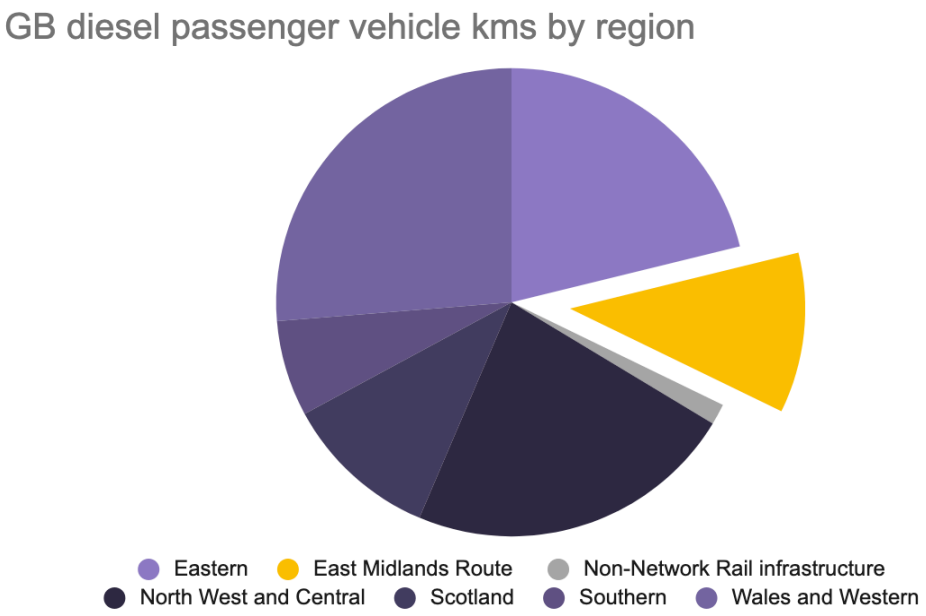
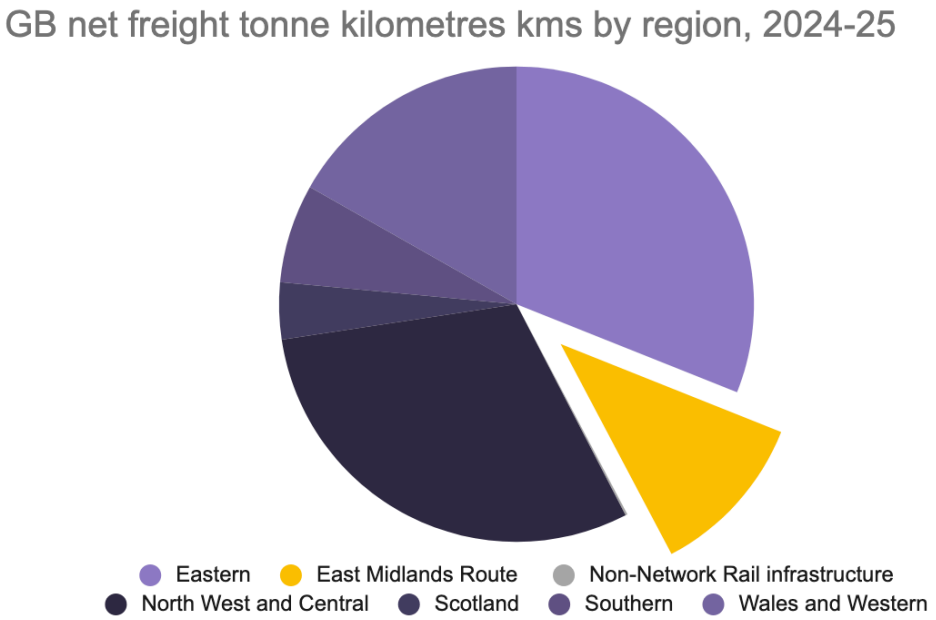


Figure 13: East Midlands Route share of total GB rail freight tonne kms: ***11.22%***



MML headline savings, electric vs diesel traction

- **£63.5 MILLION**

East Midlands Route cumulative passenger traction energy costs savings, April 2021 - April 2026.

- **£18 MILLION**

East Midlands Route estimated traction energy cost savings under full electrification in 2026-27 alone.

Full electrification of the MML to Sheffield should have been completed by late 2020. If this had take place as planned, passenger operators using the route would have saved £63.5 million in traction energy costs by now.

The failure of successive governments to follow through on their promises to the Midlands region to electrify the MML will cost passenger operators alone £18 million thanks to the new diesel price highs. We cannot estimate the savings to freight operators due to lack of access to data, but the huge number of freight movements through the Midlands means these would also be very substantial.

Discussion

While electrified rail delivers a wide range of cost efficiencies and operational benefits relative to diesel traction[7], this report focuses exclusively on traction energy costs. Rail is an energy-intensive sector in economic terms, and railways are the largest consumer of electricity in the UK. Rail services are therefore more exposed than other sectors to energy price volatility.

Like farmers in the UK, rail consumers of diesel do not pay the same fuel duty as road users, so the price they pay per litre of diesel enjoys a large effective tax subsidy relative to road transport fuels; and also relative to traction electricity, which when supplied over the grid is subject to a range of additional costs over and above the commodity price. Policy costs in the UK include the Renewables Obligations, Feed-in tariffs and the Climate Change Levy. Although some reductions in policy costs are applied to energy-intensive industries in the UK, these reductions are less generous than those in comparable European countries[8].

[7] RIA (2021) Why Rail Electrification? https://www.ceca.co.uk/wp-content/uploads/2021/04/Print-WRE-Report-FULL.pdf

[8] ONS (May 2025) *The impact of higher energy costs on UK businesses: 2021 to 2024* . Available at: https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/theimpactofhigherenergycostsonukbusinesses/2021to2024

The UK's energy market structure also means that the wholesale price of gas is almost always the main factor in establishing UK electricity prices. The compound effects of the Covid-19 pandemic and the Russian invasion of Ukraine on international gas prices have combined with these other factors to leave the UK with the highest electricity prices for industrial users out of 24 countries reporting to the International Energy Association (IEA)[9]. Evidence shows that the UK's high electricity prices are harming industrial competitiveness and economic growth[10], and also progress on electrification of heating and transport, which is essential for decarbonisation. Urgent measures to reduce electricity prices are being pursued by the UK government now[11]. Elevated electricity costs for UK industry mean that Network Rail expects to pay around 50% more per kWh for traction electricity during Control Period 7 (CP7 - began in April 2024) than it did during CP6[12].

Yet despite its fiscal privileges, diesel traction has consistently remained marginally more expensive than electric traction per vehicle km for passenger train operating companies in Great Britain for the last decade, as shown above. This includes the most recent financial year for which records are available, 2024-25, which saw electricity prices peak for rail users.

Volatile and rising traction energy costs are playing out alongside far-reaching rail reforms which will see 'track and train' brought back together again in the UK rail sector. The same company running the infrastructure will soon be running passenger train services and stations as well - Great British Railways.

Traction options for running passenger services depend on the infrastructure available on the route being served. But until now, the network operator has not been responsible for paying traction electricity or diesel fuel bills, or for reducing the emissions associated with this energy use, which accounts for the vast majority of rail energy demand.

[9] Ibid.
[10] CBI / EnergyUK (Feb 2026) *Cutting Business Energy Costs: The case for action* https://www.cbi.org.uk/media/3idjn55v/cutting-business-energy-costs-cbi-euk.pdf
[11] UK Government (April 2026) *Decisive action to break influence of gas on electricity prices* https://www.gov.uk/government/news/decisive-action-to-break-influence-of-gas-on-electricity-prices
[12] NR (May 2025) *England & Wales CP7 Strategic Business Plan* https://www.networkrail.co.uk/wp-content/uploads/2023/05/England-and-Wales-CP7-Strategic-Business-Plan.pdf

Each new TOC that is absorbed back into the public sector via the Department for Transport Operator (DfTO) brings more scope 1 and 2 emissions to the public GHG ledger - Northern Trains alone consumed over 50 million litres of diesel in 2025 - and new opex to the public balance sheet[13].

Private finance has played a very limited role in British rail electrification infrastructure to date[14], but public funding for these vital works has failed to prioritise capital spending that would principally have reduced running costs for private operators. With Great British Railways, controlling traction energy costs is also now a pressing problem for public finances, not just for regulators trying to manage ticket prices in the market. This new alignment of commercial incentives and public spending imperatives converges with the express intention that GBR facilitates better long term planning, decision making and investment in our railways: "It will be able to take a more joined-up approach to planning major improvements"[15].

Network Rail is now preparing to tender for direct-wire traction supply from decentralised wind and solar generators at scale. Market benchmarks suggest that electricity procured in this way under long-term Power Purchase Agreements is typically a third less expensive per kWh than grid-supply. This will contribute to reduced operating costs and environmental impacts of traction energy on routes that can benefit. But only 39% of the UK's rail network is electrified at the time of writing[16].

[13] DfTO (July 2025) *DfT Operator Limited (formerly DfT OLR Holdings Limited) Annual Report and Financial Statements For the year ended 31 March 2025*
https://assets.publishing.service.gov.uk/media/6877db6a0263c35f52e4dcc4/dfto-ara-2024-to-2025-large-print.pdf
[14] Centrus (2019) *Privately Financing Rail Infrastructure*
https://centrusfinancial.com/wp-content/uploads/2022/12/Privately-Financing-UK-Rail-Infrastructure.pdf
[15] DfT (Nov 2025) *A Railway Fit for Britain's Future Government Response*
https://assets.publishing.service.gov.uk/media/6912f635e9348ac8fb54f4db/a-railway-fit-for-britains-future-government-response-large-print.pdf
[16] ORR (Nov 2025) *Rail infrastructure and assets, statistical release*
https://dataportal.orr.gov.uk/statistics/infrastructure-and-environment/rail-infrastructure-and-assets/

In 2020, Network Rail published a detailed Traction Decarbonisation Network Strategy (TDNS), which included indicative route specifications for the most appropriate traction solution for every railway in Great Britain[17]. The strategy included economic modelling for a range of possible decarbonisation pathways, each assuming new electrification of hundreds of single track kilometres (STKs) would be delivered every year, to a total of 11,700-13,000 STKs. Unfortunately even the baseline position with "ambition: none" has since degraded, as HS2's later phases have been descoped.

Although all TDNS scenarios could demonstrate a positive business case - with the most ambitious also delivering the best returns on investment - the UK Government's 2021 Comprehensive Spending Review concluded the plan was unaffordable. Since the publication of the TDNS, just over 150 STKs of new electrification have been delivered on Great Britain's railways[18].

Meanwhile in India, the union government is celebrating electrifying almost 100% of its broad gauge railway network[19], which is around 4.5 times larger than Britain's. Most of this has been delivered in the last decade, and since 2016-17 this programme has cut Indian Railways' diesel consumption by 62% - nearly 18 billion litres annually[20]. In 2021/22 alone Indian Railways' electrified eight times as many route kilometres *every day* as the UK managed to achieve across the entire year[21].

[17] Network Rail (July 2020) *Traction Decarbonisation Network Strategy – Interim Programme Business Case* https://www.networkrail.co.uk/wp-content/uploads/2020/09/Traction-Decarbonisation-Network-Strategy-Interim-Programme-Business-Case.pdf

[18] https://dataportal.orr.gov.uk/

[19] Railway News (2026) *Indian Railways Nears Full Electrification Amid Disruption to Gulf Oil Routes*. 6 March. Available at: https://railway-news.com/indian-railways-nears-full-electrification-amid-disruption-to-gulf-oil-routes/

[20] https://core.indianrailways.gov.in/

[21] https://indianrailways.gov.in/railwayboard/uploads/directorate/ele_engg/RE/2024/Railway%20Electrification_final.pdf

The 2020 TDNS vision would have seen around 85% of the GB network fully electrified, with battery and hydrogen trains serving quieter branch peripheries where wires are uneconomical. The principal technological developments in traction energy since then have been two-fold. First, battery train performance has exceeded expectations, with successful trials of both commuter and intercity BEMUs leading to substantial bi- and tri-mode battery train orders to replace diesel-only rolling stock[22]. Second, the effective death knell for hydrogen trains has sounded, as economic modelling repeatedly finds they would be far more costly to run than battery trains, and attempts at real world commercial deployment have been beset by engine faults and fuel shortages, and largely abandoned[23].

The UK government, via the Department for Energy Security and Net Zero, has recently announced that it is now embarking on a strategic policy drive to 'Electrify Britain'[24]. This is very welcome and urgently needed.

But at the same time, the Department for Transport has again pushed back the date (from 'spring 2026' to 'during 2026') by which it expects to publish the new 'Integrated rolling stock and infrastructure strategy' which should clarify, amongst other things, how the GB rail network is to achieve full decarbonisation by 2050, and what the final traction solutions will look like for each route[25]. This new, long awaited, 'track and train' strategy is part of the government's Long-Term Rail Strategy mandated in the Railways Bill[26], and is expected to prefer battery trains and partial (aka 'discontinuous') electrification for most unelectrified parts of the network.

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[22] E.g. Hitachi (April 2025) *Hitachi wins new UK contract to build intercity battery trains* https://www.hitachi.com/en/press/articles/2025/04/0403/

[23] Michael Barnard (March 2025) *The Hydrogen Trainwreck Continues: Why rail operators keep ignoring math and setting money on fire*, The Future is Electric. https://medium.com/the-future-is-electric/the-hydrogen-trainwreck-continues-abeb0bf74cb1

[24] DESNZ (June 2026) Energy security, jobs and investment boost through climate action https://www.gov.uk/government/news/energy-security-jobs-and-investment-boost-through-climate-action

[25] DfT Operator (June 2026) 'Integrated rolling stock and infrastructure strategy', presentation by Michael Hayes to the RIA PowerEx conference. https://riagb.org.uk/common/Uploaded%20files/Events/PowerEx2026/Michael%20Hayes%20-%20DfTO.pdf

[26] DfT (May 2026) *Railways Bill factsheet: the Long-Term Rail Strategy*. Available at: https://www.gov.uk/government/publications/railways-bill/railways-bill-the-long-term-rail-strategy

But even with battery trains being rolled out on many routes that have a strong case for full electrification, hundreds of kilometres of new electrification will be needed every year for the next decade, everywhere there are frequent or high speed passenger services or freight movements. Overhead line electrification is a technology solution for rail traction that has been established for well over a hundred years. It is operationally superior and delivers better outcomes for rail users than any other alternative, and the way to deliver it efficiently is incredibly well understood[27].

Britain's railways should never have been left so exposed to the 'fossil fuel price rollercoaster' when the case for investing to save has been so clear for so long. Now that economy-wide electrification is being embraced by the government as the key way off that rollercoaster, it is vital that railways are not left behind.

[27] RIA (June 2026) *RIA Electrification Cost Challenge 2.0* https://www.riagb.org.uk/RIA/RIA/Newsroom/Publications%20Folder/RIA_Electrification_Cost_Challenge_2.aspx

Appendix A: Methodology

To calculate the difference in energy costs in 2026-27 between diesel and electric traction, we first had to determine some key values by analysing ORR official rail industry statistics. Data availability is much more complete for the franchised passenger TOCs than for open access, charter and freight operators, so the analysis focuses on TOCs, with some exploration of freight where data allows. We selected vehicle-kms as the most appropriate metric for the analysis, rather than train-kms or passenger-kms. Each *train* can comprise many *vehicles,* with large variations between different routes and operators, so trains cannot be used as the basis for comparison with respect to energy consumption.

Passenger-kms is useful for understanding economic efficiency of routes, but varies widely based on passenger demand / load factors / occupancy rates which are not relevant for our purposes. Freight trains are much longer and heavier than passenger trains, and rarely run empty; freight-tonne-kms moved would be the most appropriate metric for traction energy cost comparisons for rail freight, but these data are seen as commercially sensitive and are therefore not published.

We used data for total annual passenger and freight vehicle kilometres by traction type and operator, and total annual traction energy consumption in kilowatt-hours (kWhs) and litres of diesel, to calculate average values for passenger and freight vehicle-kms per kWh of traction electricity, and per litre of diesel. We also used the national figures for Great Britain to look at a longer time series (data by operator has only been available since 2021).

To assess the comparative costs per-km we then used reported financial data on total spending to determine robust estimates for the unit prices being paid by rail users for both electricity and diesel.

Spending on traction energy by operator has not historically been reported to ORR, but this data was available for franchised TOCs for 2024/25 and shared with us. Traction energy spending by passenger TOCs has instead been reported on a Network Rail Regional basis, and is published by ORR in two separate datasets, with diesel spending by region available in rail industry finances for Great Britain, and electricity spending by region available in rail industry finances for the United Kingdom. Freight operators do not report diesel spending, but regional EC4T payments to Network Rail from freight operators are reported separately as income in NR's annual financial statements. As so little freight runs on electric traction power these figures represent a negligible (just over 1%) fraction of total consumption, despite individual freight trains having much more mass and consequently traction power draw than typical passenger trains.

Passenger vehicle kms by traction type are not reported regionally, only nationally and by operator; while spending on EC4T is only reported regionally, not by operator. Diesel spend by passenger and freight operator is published. We therefore requested bespoke tabulations of vehicle kms by traction type by region from ORR, and submitted a Freedom of Information Access request to Network Rail for the average EC4T tariffs charged to different classes of operator, alongside the regional tariff rates charged for use of electrification assets. ORR regional kms by traction type data enables the regional financial data to be used; NR operator-level EC4T spend figures would allow price comparison by operator.

It is important to note that the final per kWh price that Train Operating Companies (TOCs) and freight operators pay Network Rail is slightly higher than the EC4T commodity price, to account for system losses and the use of the rail electrification infrastructure. This typically add a few pence to the total per kWh tariff rate for traction electricity[28]. These 'delivery' costs vary on a geographical basis - by Electricity Supply Tariff Area (ESTA) - that does not map perfectly onto the Network Rail Routes and Regions which are the basis for financial reporting by the ORR.

[28] NR (April 2024) *Traction Electricity Rules* https://sacuksprodnrdigital0001.blob.core.windows.net/on-train-metering/On-train%20metering/Traction%20electricity%20rules/Traction%20Electricity%20Rules%20Effective%201st%20April%202024.pdf

The published ORR figures do allow for national level analysis to be undertaken, but the geographical scope of the relevant datasets is different. Passenger vehicle kms by traction type for franchised TOCs only are published for Great Britain. The total figures for passenger TOC energy consumption in kWhs and litres of diesel are also published for Great Britain, as is the total spend by passenger TOCs on diesel for traction. The total spend by passenger TOCs on traction electricity, by contrast, is reported in rail finance statistics for the United Kingdom as a whole. However, as there is no electrified rail in Northern Ireland - or anywhere else in the UK outside of GB - the national level datasets can in practise be used for comparison.

Therefore, national level data for each financial year since 2015-16 has been analysed, alongside operator level financial data on traction energy spending for the year 2024-25 as ORR were able to share EC4T spending by passenger operator with us for that year, which we have compared with their reported diesel spending in that year. The total figure for passenger TOC EC4T spend in 2024-25 reported in each dataset differs slightly; the bespoke operator-level figures provided total to £11.72m more than the ORR national rail finance statistical release. However this is only 1.3% lower so has very little effect (around 0.5 pence) on the key product, the £ spend per vehicle km under electric traction.

Having used historical data to establish ratios for per km traction energy costs for electric vs diesel power, we were able to derive a counterfactual operating cost scenario in which all passenger diesel traction nationally runs on electric traction instead from 2015-16 onward, with a volume of EC4T consumed each year that is equivalent to the diesel consumption required to power the same number of vehicle kms in the same year.

Rail financial reporting is undertaken in arrears, by necessity, and the next statistical release will cover 2025-26. To make predictions about the likely cost impacts of the wider oil price crisis on rail operators during the current financial year, we used contemporary data for red diesel costs and industrial electricity prices as a proxy for the price paid by rail traction energy consumers.

The Agriculture and Horticulture Development Board (ADHB) publish a monthly average fuel price tracker, which is updated a few days after the end of each calendar month with average UK red diesel prices for the most recent period. Meanwhile the Department for Energy Security & Net Zero (DESNZ) publish a quarterly energy prices statistical release, which includes average prices of electricity purchased in the manufacturing sector by Large (8.8-150 Gigawatt hours GWh pa) and Extra Large (>150GWh) electricity consumers[29]. All franchised passenger TOCs are classified as Large or Extra Large electricity consumers by these measures.

To assess whether these data sources could serve as a useful proxy for rail industry traction energy prices, we reviewed historical per litre of diesel and per kWh prices in these data against the prices reported in the rail finance statistical releases back to 2015-16.

These data reveal that passenger TOCs appear to have consistently paid proportionately more than the wider market benchmark per litre of red diesel over the last decade, with the prices only converging fully in 2022-23. Meanwhile the unit price paid for traction electricity is closer to what we would expect consumers of their scale to pay, albeit also marginally higher - until 2022-23, when successful hedging (pre-purchase of electricity - see below) strategies by rail consumers saw their unit price remain relatively stable while market prices rose steeply, only converging from April 2024 after the end of CP6.

The price patterns for both fuels over time correlate well enough across the rail sector and the wider economy - with a very close match for each in the most recent FY 2024-25 - that we can be confident that use of these data to extrapolate traction energy prices into the 2026-27 year ahead should be reasonably robust.

We then applied the most recent available data for pence per litre of red diesel (May 2026) and kWh of electricity price for large electricity consumers to the most recent figures for kWhs per km for electric traction and litres of diesel per km for diesel traction to calculate an estimated cost per passenger vehicle km for the 2026-27 financial year, assuming that current prices for each fuel persist throughout the year.

29 https://www.gov.uk/government/statistical-data-sets/prices-of-fuels-purchased-by-manufacturing-industry

We calculated a projection for absolute costs of diesel traction and electric traction to March 2027 by assuming that total vehicle kms travelled in 2026-27 would be the same for each traction type as in 2024-25. We then calculated the annual projected cost of ongoing dependence on diesel for traction compared with the counterfactual of the same overall vehicle kms travelled under a fully electrified railway network.

Finally, we conducted a route-level analysis for the East Midlands Route, which is dominated by the Midlands Main Line, using a bespoke tabulation provided on request by ORR statisticians, documenting passenger vehicle kilometres by traction type (East Midlands route) right up to 2025-26. We assumed 2025-26 vehicle kms would apply in 2026-27, and used operator-specific figures for kms per kWh / litre of diesel for East Midlands Railway in 2024-25.