

Written evidence submitted by Dr Steve Melia (EVP0006)

About Me

I have been a Senior Lecturer in Transport and Planning at the University of the West of England, Bristol, since 2010. [My research](#) has focussed on the relationship between transport and the built environment and how to make transport more sustainable. I am currently nearing completion of an evaluation of drivers' use of electric cars, which were provided to a car club by [this European project](#) and have just begun a project researching the electrification of waste disposal trucks. My latest book, *Roads Runways and Resistance* tells the story of the most controversial transport issues, which have sparked protest movements, over the past 30 years including the fuel tax protests of 2000 and campaigns against road pricing between 2003 and 2008, discussed below.¹

I was one of the invited speakers to the [UK Climate Assembly's session on Decarbonising Surface Transport](#) in February 2020 and gave evidence to the Environmental Audit Committee's inquiry into [Greening the Post-Covid recovery](#) in December 2020.

Main Points of the Evidence

- The timetable for the phase-out of petrol and diesel cars will not occur rapidly enough to meet the Sixth Carbon Budget – further measures will be needed.
- The current proliferation of incompatible charging and payment systems is a major barrier to the uptake of EVs. Government should take the lead to establish compatible systems.
- Waste trucks are one example of the challenges facing the electrification of heavier vehicles. This will impose greater costs on local authorities and upgrades to local electricity distribution networks.
- The politics of motoring taxation create a risk that national road pricing might actually cause higher carbon emissions than doing nothing.
- In the short-term governments should reverse the 20-year decline in taxation of petrol and diesel, possibly supplemented by urban congestion charging schemes.
- National road pricing may become an option after 2035, when petrol and diesel cars are a dwindling proportion of the vehicle fleet, but additional taxation of electricity used to charge vehicles might be a better option.
- We cannot rely on electrification plus road pricing to achieve the surface transport carbon budget – further measures will be needed, to reduce vehicle ownership (in urban areas) as well as traffic volumes.
- International comparisons provide no examples of countries which have solved these problems, overall. Norway is the best example of electrification but their vehicle fleet is electrifying much more slowly than new sales.

Accelerating the shift to zero emission vehicles

Feasibility and Challenges of the 2030/2035 Targets

The 2030 and 2035 phase-out targets will only take us part of the way towards the decarbonisation of one part of surface transport. They should be regarded as a first step; further action will be required to achieve the carbon budgets required by the Paris Agreement and the amended Climate Change Act.

The inquiry brief notes that the **Climate Assembly** placed “the emphasis on shifting to electric vehicles and improving public transport, rather than on large reductions in car use.” That is a fair reflection of public preferences, all things being equal. However, the Assembly’s recommendations are **not a comprehensive decarbonisation plan** – because they were not asked to produce one. There was no mechanism within the Assembly process for calculating the outcomes of their recommendations, nor for checking whether all the recommendations were consistent with each other. The resulting inconsistency is most apparent when comparing the recommendations on aviation (which would require large-scale offsetting) with those on carbon offsetting (which rejected all the options for large-scale offsetting). The recommendations on surface transport would not be enough, on their own, to reach the carbon budgets. No-one pointed this out to the Assembly members, nor asked: “so what else would you recommend?”

In *The Sixth Carbon Budget* the Climate Change Committee state that plug-in hybrids (PHEVs) are only marginally better in lifetime carbon emissions than petrol or diesel vehicles.² Other research has demonstrated that drivers of PHEVs do not take full advantage of their potential for electric power, and as a result, the official European emission ratings substantially understate their real-world emissions.³

The Sixth Carbon Budget requires surface transport to reduce its emissions by 70% by the mid-2030s. The ‘Balanced UK Pathway’ scenario assumes that:

- 97% of all vehicle sales will be entirely electric by 2030, and:
- Average car-kilometres decrease by 6% by 2030, and 17% by 2050⁴

However, following lobbying by some motor manufacturers such as Toyota (which I witnessed directly) the Government’s recent announcement would allow the sale of PHEVs to continue until 2035.⁵ So unless that policy is reversed, a larger cut in car mileage will be required in addition to the moves toward electrification.

It should also be noted that the assumptions of the Climate Change Committee have been more optimistic than precautionary. Some academic analyses have suggested that the UK would need to cut much more quickly than the current carbon budgets would require, in order to comply with the Paris Agreement.⁶

Actions Required by Government and Private Operators to Encourage Uptake

This is a big question. I will make three general points, then concentrate on one about charging, drawing on the evaluation project I am conducting into the electric car club cars.

The Climate Change Act requires a reduction in the use of petrol and diesel vehicles. It does not require them to be replaced. Reducing vehicle ownership would alleviate many of the challenges associated with electrification e.g. increased demands on the distribution network. That should be an important objective for urban transport policy (it already is in some places, but rarely made explicit). Assisting car clubs to acquire EVs could help that process.

Scrappage schemes may also help. They will become more effective after 2035, when the option of buying another fossil-fuelled vehicle has been removed. A scrappage scheme should not require the person disposing of the vehicle to buy another one. Other options, such as public transport passes and bicycles/electric bicycles should be available.

In the meantime, government should progressively increase taxation on the sales of new petrol and diesel cars, using the revenue to increase the subsidy on EVs until the market tips in their favour.

The charging networks are currently a major barrier to uptake, and require rationalisation as well as expansion. I would urge members to look at the Zap Map app, if you have not already done so. That app shows all of the charging points available across the UK. The key shows the charging speeds and the different types of connector, which are mostly incompatible. Each point on the map reveals the network (there are dozens) ownership and conditions attached to each charging point. They are all different. Most of them are on private land with different time limits, which the app does not show. People are sometimes fined for parking too long at particular charging points. The different networks all have their own payment systems, often involving a different app or key fob and requiring the user to register their credit card or bank details with that network. Some companies, including Zap Map, have been trying to create umbrella services, but at the moment these are simply adding to the profusion of systems available.

This pattern causes confusion and uncertainty for anyone planning to use EVs outside of their home area – something which most of the car club members we interviewed were reluctant to do. Here is one example:

“[My partner] just wasn’t confident enough that he could get to it and then he was getting conflicting information ... saying, “Yeah, there’s loads of charging points but they’re all different types,” and that’s confusing... it put him off hiring it because he wasn’t confident and he thought he was going to have to go quite a way off his route.”

A useful model for government may be the [memorandum of understanding](#) on mobile phone charging, facilitated by the European Commission in 2009. EV charging systems are determined by the manufacturers, which would make it difficult for one country to impose a standard, but a single payment system and common set of usage conditions are perfectly feasible. They should operate with contactless credit cards, not requiring the user to register, download an app or use a device. A symbol could then identify all the public and private charging points using that method and following those conditions.

Phasing out of Diesel HGVs (Example of Waste Disposal Trucks)

Our research into the electrification of waste disposal vehicles is currently at an early stage, but several points are clear from the start. At present, the electric trucks currently available would be unable to perform all of the rounds scheduled by local authorities, due to charging and range limitations. Solutions to that problem may include some combination of rescheduling, purchase of more vehicles and reduction in waste volumes. Whatever solutions are chosen, there will be substantial cost implications for local authorities. In addition, the simultaneous charging of many electric HGVs will impose big additional demands on local electricity distribution networks, which will be expensive to upgrade. It is not clear, at

present, whether the governments and/or the distribution companies are taking full responsibility for the cumulative impacts of electrification across all sectors.

Road Pricing

The Case for Road Pricing and its Impacts

Road pricing was originally proposed (and considered by the UK government in the 1960s⁷) mainly as a solution to road congestion. From a neo-classical economic perspective, its purpose is to ration access to road space to increase the efficiency of its use. Today, we face a much a bigger problem: how to avert climate breakdown. Replacing tax revenue from petrol and diesel is a secondary issue. The politics of motoring taxation, which I have researched, create a risk that national road pricing *might actually produce higher carbon emissions* than ‘doing nothing’.

If the main objective is to reduce emissions as fast as possible, progressively increasing the tax on petrol and diesel would be more effective, and easier to collect, than road pricing. If a road pricing scheme were to tax congested roads more highly, and if its revenues were fully offset by cuts in fuel taxes, the net outcome would be an increase in vehicle mileage and carbon emissions.⁸ Even a fixed mileage rate would be less effective than fuel taxes at restraining carbon emissions. So whether road pricing would or would not assist decarbonisation crucially depends on the politics of charging motorists more for driving.

Public Support/Opposition

In researching for [Roads Runways and Resistance](#), I interviewed civil servants, political advisors, city leaders, academic advisors and leaders of the campaigns against fuel tax rises in 2000 and road pricing/congestion charging in the early 2000s.¹ One conclusion to emerge is that using fiscal methods to reduce something which people perceive as a necessity is likely to provoke a popular backlash with political consequences enduring long after the protests have ended.

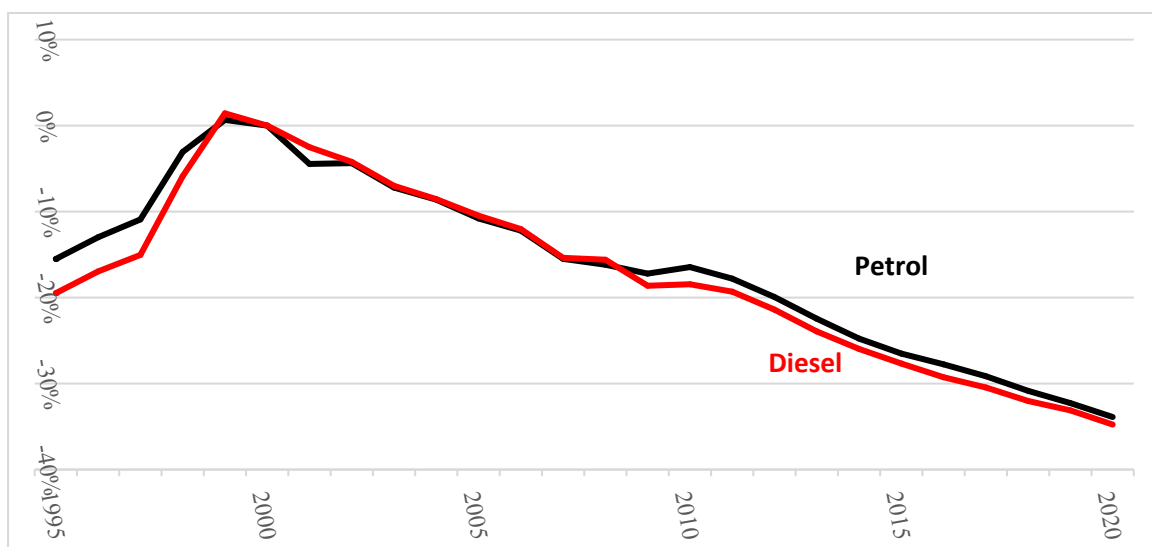


Figure 1 – Total tax per litre adjusted for inflation (RPI) compared to base year 2000⁹

Figure 1 shows the decline in the rates of tax on petrol and diesel which followed the fuel tax protests of 2000 and are continuing today. Both rates have fallen by over a third. For national road pricing to be effective against climate change it would have to increase the cost of driving, which begs the question: why would the politics of road pricing be so radically different from the politics of fuel taxation?

Although the various campaigns against national road pricing and local congestion charging in Manchester and Edinburgh were less disruptive than the fuel tax protests, they were driven by similar public concerns and they had similar political consequences. As an advisor to the Blair government told me:

“In the abstract, [national road pricing] looks the perfect demand management tool and so we can all agree in the seminar room on the desirability of this, and it chugs along and then when it emerges into the light of real politics it gets shot down.”¹

Which Schemes Would be Most Appropriate for the UK?

Clearly governments will have to find some way to replace the revenue lost from fuel taxation after EVs replace most petrol and diesel vehicles. In the short-term taxation policy should favour EVs and discourage the use of petrol and diesel vehicles. The most effective way to do that is to gradually reverse the reductions in fuel duty shown above, and increase sales taxes on such vehicles. This could be supplemented by urban congestion charges, where the political will exists to implement them (with no reductions in fuel taxation). National road pricing would be too vulnerable to political pressures to make much impact on carbon emissions, and it might well cause them to increase.

In the longer-term, after sales of petrol and diesel vehicles have ended, national road pricing could be considered as a demand-management tool. However, if the main aim is to restrain the growth in electricity demand, additional taxation of electricity used in vehicles would be more effective.

The most important conclusion from all the evidence above is that electrification plus road pricing will not be enough to achieve the emissions reductions required by the Paris Agreement and the UK carbon budgets. What other measures might be appropriate and effective may lie outside the scope of this inquiry, but your final report should acknowledge this. I would suggest a combination of policies aiming to reduce vehicle ownership and use in urban areas, concentrate more of our population in higher-density urban areas with improvements to public transport and cycling alongside direct traffic reduction measures to support the quality of life in those areas. Outside urban areas the most important first step that any government could take is to halt the current expansion of strategic road capacity.

Lessons from Other Countries on Decarbonisation and/or Road Pricing

Although many individual examples of good practice may be observed overseas, the overall pattern of transport is remarkably similar across Western Europe as illustrated in Table 1, (with higher levels of driving across North America and Australia). Countries offering the best examples of *urban* transport planning have pursued similar policies for *interurban* transport, producing national outcomes only marginally better than the UK. The combination of toll motorways and high-speed rail in France has not produced lower levels of driving. In the developed world, only densely populated city states such as Hong Kong and Singapore

have achieved significantly lower levels of driving, through various restrictions on car ownership.

	Modal Share Km by Car	Car Km per inhabitant
EU-28	81%	9,441
UK	85%	10,143
Highest in West Europe	88% (Portugal)	11,628 (Italy)
France	80%	11,084
Netherlands	86%	8243
Lowest in West Europe	73% (Austria)	7090 (Spain)

Table 1 – Personal Transport Compared Across Europe¹⁰

On **electrification** of private cars, **Norway** is the leading example. Through a combination of tax incentives and exemption from parking and toll road charges in 2020 it became the first country where most cars sold were electric. However, the composition of the overall vehicle fleet changes much more slowly than the new sales. In 2019 44% of new sales were electric, but only 9% of private cars registered across the country.¹¹

In conclusion, no country has yet solved this problem and no single set of measures, such as electrification or road pricing, will enable the UK to achieve its carbon budgets.

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Endnotes

¹ Melia, S. (2021) Roads Runways and Resistance - from the Newbury Bypass to Extinction Rebellion. London: Pluto Press. <https://www.plutobooks.com/9780745340593/roads-runways-and-resistance/>

² Committee on Climate Change, (2020) The Sixth Carbon Budget - the UK's Path to Net Zero [online]. <https://www.theccc.org.uk/publication/sixth-carbon-budget/>.

³ International Council on Clean Transportation (2020) Real-world usage of plug-in hybrid electric vehicles: Fuel consumption, electric driving, and CO2 emissions [Online]

⁴ Committee on Climate Change, (2020) The Sixth Carbon Budget Sectoral Summary – Surface Transport [online]. <https://www.theccc.org.uk/publication/sixth-carbon-budget/>.

⁵ DfT and BEIS (2020) Government takes historic step towards net-zero with end of sale of new petrol and diesel cars by 2030. [Online]

⁶ Anderson, K., Broderick, J.F. and Stoddard, I. (2020) A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways. Climate Policy. pp. 1-15.

⁷ Smeed, R.J. (1964) Road Pricing: The Economic and Technical Possibilities Her Majesty's Stationary Service, London (1964) (report of a Commission chaired by)

⁸ Grayling, T., Sansom, N., & Foley, J. (2004) 'In the fast lane: fair and effective road user charging in Britain'. London: [Institute of Public Policy Research](https://www.instituteofpublicpolicyresearch.org/) (an old study, but the main conclusion remains valid).

⁹ DfT (2020) [Energy and Environment Data Tables ENV0105](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/528105/energy-environment-data-tables-env0105.pdf) and ONS (2021) [RPI All Items 1987 = 100](https://www.ons.gov.uk/peoplepopulationandcommunity/healthandlife/birthsdeathsandmarriages/deaths/rpi-all-items-1987-100)

¹⁰ European Commission (2018) EU Transport in Figures – Statistical Pocketbook [Online]

¹¹ Statistics Norway (2021) [Table 07849](https://www.ssb.no/en/transport/transporttable/202101): Registered vehicles, by type of transport, type of fuel and year