Tractor Attack

Fairness in pricing traffic pollution and rising SUV emissions in Kensington & Chelsea and beyond

October 2023

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Possible is a UK based climate charity working towards a zero carbon society, built by and for the people of the UK.

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This briefing note was prepared by Possible's director of innovation Leo Murray, with support from data lead Duncan Geere and technical director at Green Gumption, Jamie Beevor.

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Cover photo
Leo Murray

Executive Summary

- With respect to greenhouse gases, it is no longer true that low income motorists are likely to be driving more polluting vehicles
- Average CO2 emissions per kilometre (gCO2/km) from new internal combustion engine (ICE) vehicles are no longer falling at the UK and London levels; and they are rising in urban areas where large sports utility vehicles (SUVs) are most popular, such as Kensington & Chelsea
- The annual reduction in the average CO2 emissions of new cars sold in the UK is now exclusively attributable to the rapidly growing market share of electric vehicles (EVs), and EV sales are expected to be the main source of future CO2 reductions from now on
- The recent trend towards larger, heavier, more powerful cars such as SUVs means that on average, a car that was bought new in 2013 is likely to have lower CO2 emissions than a new ICE car bought in 2023
- ICE cars that are seven years old in 2023 will, on average, have the lowest CO2 emissions per kilometre in the overall UK ICE car fleet
- The sales price of new ICE cars in the UK in 2023 correlates closely with gCO2/km - the more

expensive the car, the higher its carbon emissions are likely to be

- The richest fifth of households in England are 81% more likely to own a super-heavy emitting car (226gCO2/km or above) than those in other income bands
- In Kensington & Chelsea, the large SUV capital of Britain, heavy and super-heavy CO2 emitting cars are far more prevalent in the highest income postcodes
- Overall, average gCO2/km of residents' cars in Kensington & Chelsea consistently increases with income across postcodes
- One of the most expensive postcode districts for housing in London, SW1X, has by far the highest gCO2/km for residents' cars
- EVs in Kensington & Chelsea are least common in the lowest and highest income postcodes
- 'Polluter pays' principles applied to motoring charges such as parking fees will fall disproportionately on the rich - not on poorer motorists, as is often assumed

Introduction

The expansion of London's Ultra Low Emissions Zone (ULEZ) to outer London boroughs with lower levels of access to public transport and higher levels of car ownership has generated a great deal of heat nationwide around environmental policymaking, and in particular around policies aimed at reducing the harms of excess car use.

The more legitimate recent criticisms of the ULEZ have centred around social justice arguments. Notwithstanding the facts that 70% of the lowest income Londoners do not own cars, and that London's most deprived communities are exposed to the highest levels of toxic air pollution[1], it is nevertheless true that lower income car owners tend to own older vehicles[2]. They are also less able to afford to upgrade to a newer car in response to policy levers like the ULEZ, leading to broader complaints that shifting to pollution-based motoring charges will disproportionately impact on

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1 https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/car-ownership-london#:~:text=Answer&text=Sadiq%20Khan%20

2 https://www.bymiles.co.uk/wp-content/uploads/research-and-reports/by-miles-university-of-manchester-low-income-car-tax-penalty-report-2021.pdf

those least able to either pay or to change, and is therefore unfair[3].

The Prime Minister Rishi Sunak has now used similar arguments to justify pushing back the 2030 phaseout date of the sale of new internal combustion engine (ICE) cars to 2035[4], and to scrap a whole range of recent policy measures intended to support a shift away from car use in cities[5] - placing the UK's economy-wide net zero target in severe jeopardy[6].

The public debate around policies that are characterised by opponents as 'anti-motorist' is unhelpfully muddied by the routine conflation of air pollution with greenhouse gas emissions[7]. Motor vehicles are a dominant source of both types of pollution, but the trends for each have diverged, with important implications for policy making.

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[3] E.g. https://twitter.com/JohnJohnStewart/status/1670695458778251266?s=20

[4] https://www.gov.uk/government/speeches/pm-speech-on-net-zero-20-september-2023

[5] https://www.gov.uk/government/publications/plan-for-drivers/the-plan-for-drivers

[6] https://www.carbonbrief.org/analysis-uk-governments-climate-u-turns-put-legally-binding-targets-in-jeopardy/

[7] E.g. see Telegraph headline; ULEZ and CAZs do not target carbon pollution https://www.telegraph.co.uk/politics/2023/08/12/keir-starmer-ulez-clean-air-zones-scrapped/

Clean Air Zones

In common with other UK Clean Air Zones (CAZ), the London ULEZ applies minimum emissions standards to vehicles entering the zone, namely Euro 6 for diesel and Euro 4 for petrol fuelled cars[8]. These standards derive from the European Commission's long term air quality strategy and associated regulatory pathway for vehicle emissions. First introduced in 1992, the regulations have required manufacturers to meet progressively more stringent limits on the toxic nitrogen oxides and fine particulate matter found in tailpipe emissions from new road vehicles, culminating in the Euro 6 standard[9]. Automakers are prohibited from selling new cars which fail to meet the applicable contemporary standard into the European (and UK) market.

As new cars sold in the UK have had to conform to Euro 6 since September 2015, only diesel cars older than eight years are liable to be subject to the ULEZ daily charge (Euro 4 has been in place since January 2006). However, the drastic reduction in both the manufacture and purchase of new cars during the covid pandemic meant that by 2021, the average age of a car in the UK had reached a record 8.7 years[10].

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8 https://www.gov.uk/guidance/driving-in-a-clean-air-zone#minimum-emission-standards

9 https://theicct.org/sites/default/files/publications/ICCT_Euro6-VI_briefing_jun2016.pdf

10 https://www.smmt.co.uk/2022/08/supply-slows-down-second-han

In the case of air pollution from traffic that directly affects public health (nitrogen oxides [NOx] and particulate matter [PM]), the design of the regulatory framework means there is a straightforward link between the age of vehicles, the emissions standard they are likely to meet, and the likelihood they will be captured by a charge.

This is often assumed to mean that Clean Air Zones like the ULEZ, while very effective at removing the most polluting (in terms of toxic NOx and PM) vehicles from the mix, may tend to see their direct economic impact concentrated on lower income car owners, many of whom may have chosen to buy second hand diesel cars for their fuel economy.

However, it is not clear that there is in fact any inequitable effect in the strict sense of distributional impacts of charging cars based on air pollution, and if one does exist, it is likely to be small. A major study into environmental injustice in the UK using 2011 Census data found that households in richer areas were responsible for a much greater share of air pollution from car and van use than those in areas with more poverty[11]. This difference was principally due to richer households being both much more likely to own cars of any kind and also more driving many more miles. However, vehicles owned by those in the poorest areas, "also tend to produce lower, per km, NOx emissions than the average

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d-car-sales/#:~:text=As%20supply%20for%20new%20vehicles,a%20record%208.7%20years%20old.

[11] Barnes et al, (2019) *Emissions vs exposure: Increasing injustice from road traffic-related air pollution in the United Kingdom*, Transportation Research Part D: Transport and Environment https://www.sciencedirect.com/science/article/pii/S1361920919300392

vehicle owned in less poor areas". Our own analysis of vehicle ownership by fuel type and income suggests this gap may have closed somewhat as higher income households are now only slightly more likely to own diesel cars than lower income ones.

But crucially, the study found that cars owned by those in the poorest neighbourhoods were only, on average, 1.2 years older than those in the richest neighbourhoods[12]. This is explained by the oldest cars on the road being the second, third or fourth cars in multi-car households, who are overwhelmingly in the top half of the income spectrum. Meanwhile, *exposure* to air pollution was highest in the poorest areas, with the lowest levels of car ownership.

Including remedial measures like targeted exemptions and scrappage schemes and recycling net revenues into improving bus provision (all features of the London ULEZ) can ensure that CAZs are progressive in terms of their overall distributional impacts; in other words, on balance they will benefit those on lower incomes more than they cost them. This may still be cold comfort to some of those living in conditions of forced car ownership on urban fringes[13]. As many studies have found, public support for environmental policy that seeks to change behaviours is strongly related to

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[12] Ibid.

[13] https://www.london.gov.uk/press-releases/assembly/sian-berry/londoners-feel-forced-to-have-a-car

perceptions of fairness[14] - and this can be easy to exploit for the forces seeking to defend the status quo.

[14] E.g. https://www.theccc.org.uk/publication/the-implications-of-behavioural-science-for-effective-climate-policy-cast/ & https://www.ipsos.com/sites/default/files/ct/publication/documents/2022-06/net-zero-living-ipsos-cast-2022.pdf

Pricing carbon pollution from motoring, and the rise of SUVs

The Euro emissions standards for exhaust pollutants are separate from the much more complex regulations governing carbon emissions from new road vehicles. Mandatory CO2 standards for new passenger cars in Europe were not introduced until 2009, setting a 2015 target of 130gCO2/km for the average emissions across the entire fleet produced by all manufacturers selling cars into the European market[15]. Individual manufacturers were assigned different fleet average targets, with higher CO2 emissions allowed for manufacturers of heavier cars. The target for new cars in the period 2020-24 was set at 95g/km, and when all of the different compliance mechanisms are factored in, this target has broadly been achieved[16].

These regulations have been highly effective at improving the fuel efficiency and carbon intensity of Europe's car fleet, greatly accelerating the annual rate of reduction in the average CO2 emissions of new cars since they were introduced. However, this progress was arrested and then went into reverse between 2016 and 2019, in both the European and UK car markets, thanks to

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https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/co2-emission-performance-standards-cars-and-vans_en

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https://theicct.org/sites/default/files/publications/eu-co2-pvs-performance-2020-aug21_0.pdf

an industry-wide drive to persuade consumers to buy larger, heavier, 'Sports Utility Vehicles' (SUVs)[17].

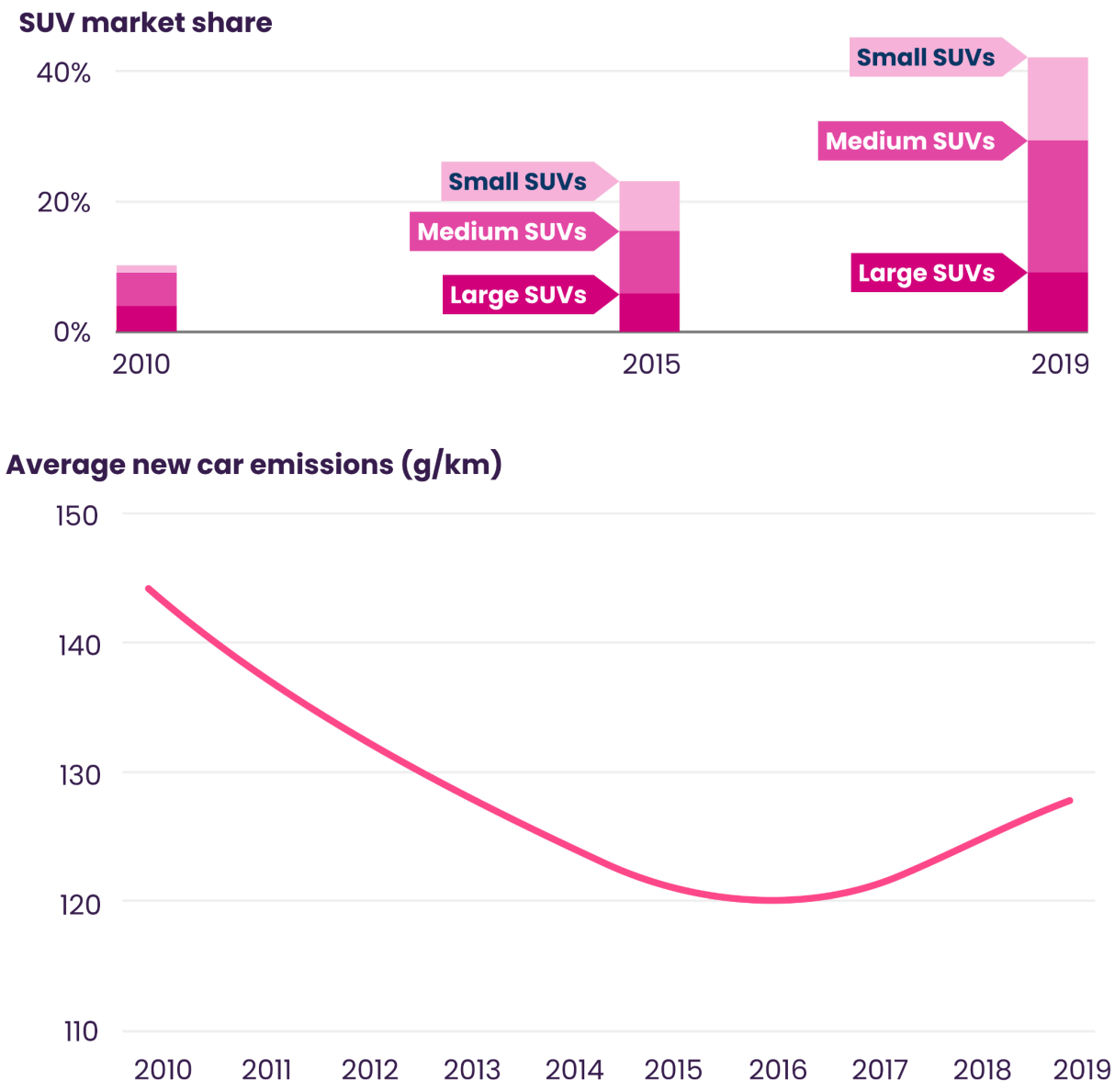

Figure 1. Average new car CO2 emissions (NEDC) have been increasing with SUV sales.

Sources: Society of Motor Manufacturers and Traders, analysis of EEA Monitoring of CO2 emissions from all new passenger cars sold in the UK.

[17] https://www.badverts.org/s/Upselling-Smoke-FINAL-23-07-20.pdf

This drive has been so successful that by 2019, for every one electric vehicle (EV) sold in the UK, 37 new SUVs were sold[18]. This extraordinary shift is part of a global trend which the International Energy Agency warns is eclipsing emissions savings from electrification, with SUVs the second largest source of increasing emissions worldwide after power generation[19]. SUVs have on average 20% higher CO2 emissions than conventional cars - in some cases, such as Range Rovers, much higher - due primarily to their greater mass.

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https://d2e1qxpsswcpgz.cloudfront.net/uploads/2020/03/ukerc_review_energy_policy_19.pdf

19

https://www.iea.org/commentaries/growing-preference-for-suvs-challenges-emissions-reductions-in-passenger-car-market

Figure 2. Heavier cars tend to have greater CO2 emissions.

Sources: Data collated by Professor Ian Walker of Swansea University, kindly reproduced here with his permission.

The problem of rising CO2 from 'autobesity' is so serious that a recent study by the UK Health Security Agency found that 'downsizing' policies to incentive smaller, lighter cars could yield a similar scale of emissions savings to 2050 as electrification[20].

While the current standard means the average CO2 emissions of new cars sold in the EU & UK should be 95g

[20] Dearman, C. et al (2023) Sports Utility Vehicles: A Public Health Model of Their Climate and Air Pollution Impacts in the United Kingdom, Int. J. Environ. Res. Public Health 2023, 20(11), 6043; https://doi.org/10.3390/ijerph20116043

CO2/km, the petrol Land Rover Defender 2020, for example, has emissions of 255-283gCO2/km - two and a half to three times above the overall target[21]. Mile for mile, every new Defender will have the climate impact of three average new cars when in use. This is only permissible through a combination of manufacturers of heavier vehicles like Land Rovers being given more generous average fleet emissions targets (131.8gm/km instead of 95g, in JLR's case), and the purchase of 'super-credits' from all-electric manufacturers like Tesla[22]. Large SUVs such as Defenders and Range Rovers are so profitable for their makers Jaguar Land Rover (JLR) that in 2020 JLR opted to pay out £35m in fines for breaching their carbon limits rather than comply with them[23].

Although average emissions from a new car sold in the UK climbed every year from 2016 to 2019, in 2020 they began to fall once again, more steeply than ever. This fall is no longer being driven by fuel efficiency improvements in petrol and diesel powered cars, but is instead thanks to the rapidly increasing market share of fully electric vehicles (EVs)[24]. Indeed, further emissions

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21 https://www.landrover.co.uk/Images/LandRoverDefender-1L66320100000WGBEN01P_tcm295-763133.pdf

22 "Jaguar Land Rover teams up with Tesla to help meet EU emission rules", Financial Times, October 2022 https://www.ft.com/content/ee41c9dd-d9f3-4b4f-9598-f0d392361af8

23 https://www.ft.com/content/e27c49b6-d13f-48b1-b35e-e69c61229817

24 https://www.smmt.co.uk/wp-content/uploads/sites/2/SMMT-Sustainability-Report-2023.pdf

reductions from new cars are now expected to derive not from CO2 standards, but from the UK's 2030 internal combustion engine phaseout date for new cars and the new Zero Emission Vehicles (ZEVs) mandate, which will see the proportion of ZEVs sold in the UK rise progressively from now until 2030[25].

Following the UK's exit from the European Union, the government's plans for a parallel CO2 standards regime for new cars sold in the UK currently propose only to "ensure the fleet does not become less efficient over time", and not to "significantly increase the efficiency of the non-ZEV fleet"[26]. Now that the 2030 phase out date for non-ZEVs has been abandoned, this "flat scenario" is likely to need to be strengthened to either the "tightening scenario" in which CO2 emissions targets for each manufacturer decrease by 2% annually to 2030; or even better, the "lightweighting scenario", where manufacturers must also shift production to lighter vehicle classes, if the 6th Carbon Budget is to remain within reach.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067018/outcome-and-government-response-to-the-green-paper-on-a-new-road-vehicle-co2-emissions-regulatory-framework-for-the-uk.pdf

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1154610/zev-mandate-co2-emissions-regulation-consultation-document.pdf

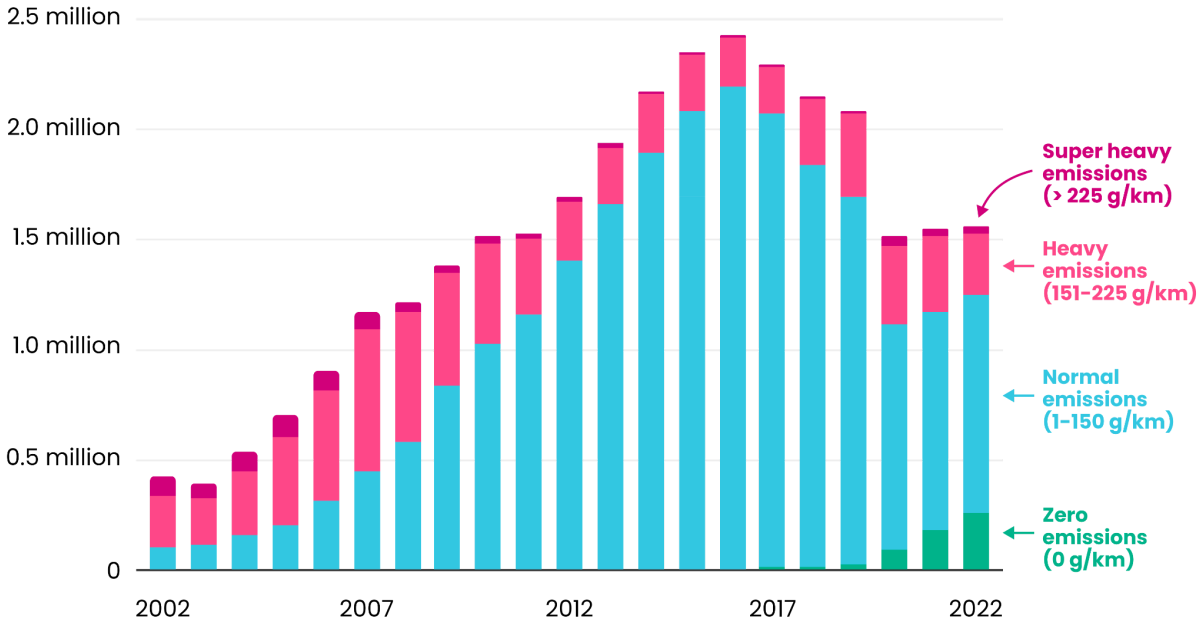

Figure 3. New car registrations by CO2 - UK.
Source: Department for Transport new vehicle licensing statistics 2023.

As can be seen in figure 3, while the covid pandemic resulted in a collapse in overall new car registrations, growing sales of EVs have finally reached a scale where they can begin to move the dial on average new car emissions. But this benign effect is still suffering from the headwind from SUV marketing. Heavy-emission cars had diminished to a niche market segment by the first half of the noughties, and super-heavy emitting cars had been all but eliminated from new car sales. But as manufacturers' SUV marketing drive began to sway new car buyers, these high-pollution segments expanded, reversing the previous trend towards lower average emissions.

In the last three years, as EVs have taken off (and conventional car sales have gone through the floor), their positive influence on emissions from new cars has

been locked in a battle to outweigh the negative effect of the Range Rover tendency.

In 2021, our research for our Badvertising partnership project with the New Weather Institute and Adfree Cities revealed that three quarters of new SUVs and two thirds of all large SUVs bought in the UK are registered to urban addresses[27].

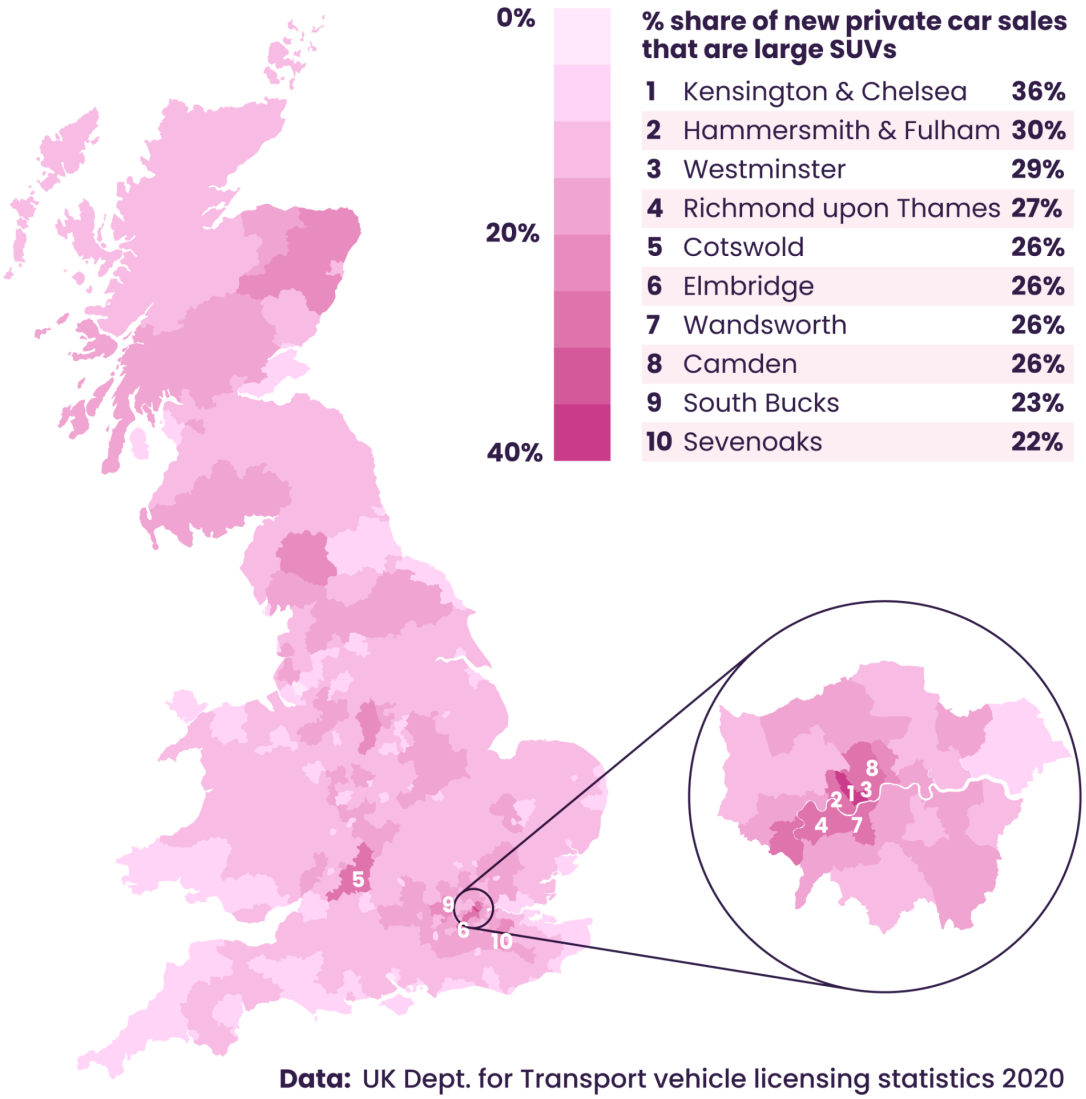

Figure 4. Large SUVs as a share of private car sales by UK local authority. Source: Department for Transport new vehicle licensing statistics 2020.

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www.badverts.org/latest/mindgames-on-wheels-our-latest-report

What's more, we found that the largest SUVs are most popular in three wealthy West London boroughs - Kensington and Chelsea, Hammersmith and Fulham, and Westminster. One in three new private cars bought in these areas is now a large SUV.

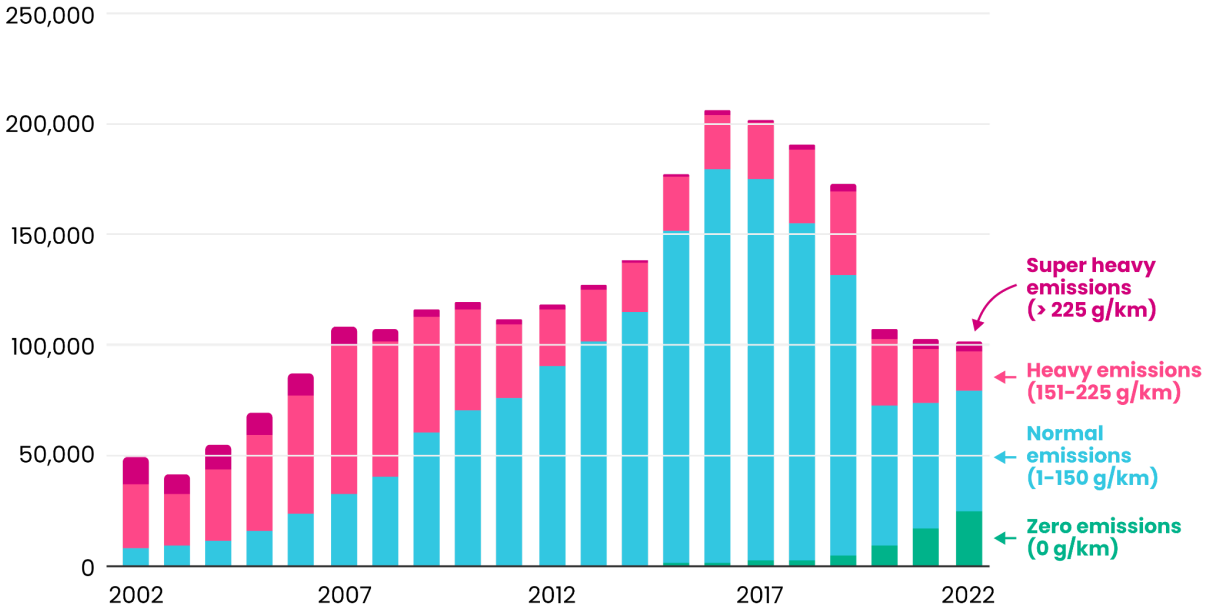

Figure 5. New car registrations by CO2 band - London. Source: Department for Transport new vehicle licensing statistics 2023.

Figure 5 shows that London-wide, EVs are now winning out against heavy-emitting SUVs, aided by policies such as the ULEZ, emissions-based parking charges and the rollout of public EV chargepoints.

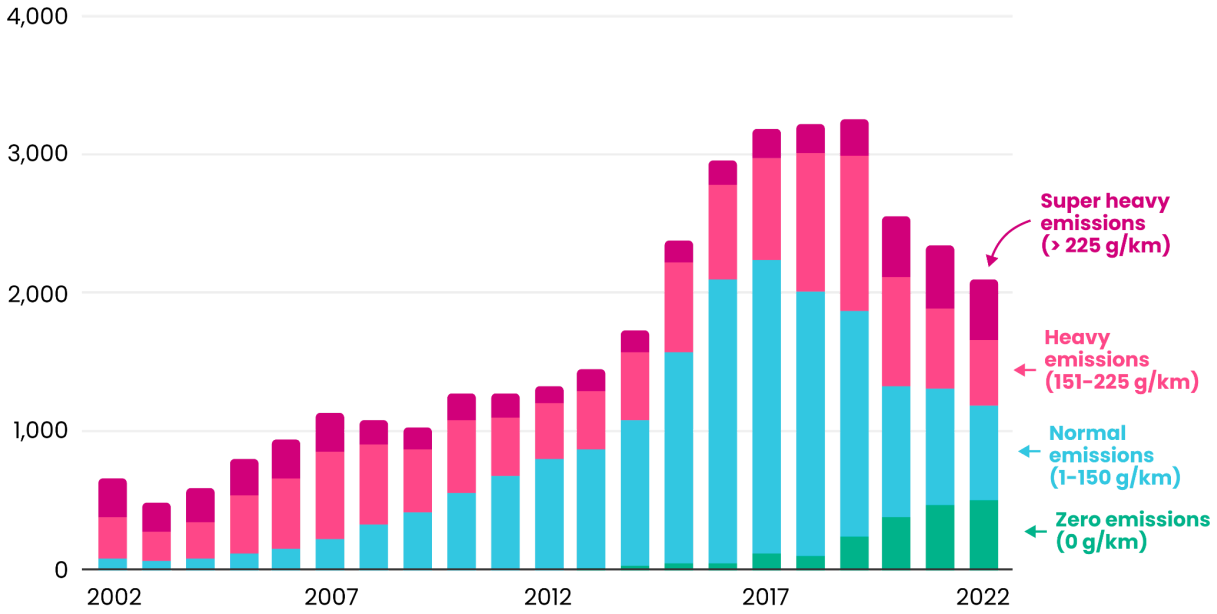

Figure 6. New car registrations by CO2 band - Kensington & Chelsea.
Source: Department for Transport new vehicle licensing statistics 2023.

However, in the SUV capital of Britain, the Royal Borough of Kensington and Chelsea (RBKC), heavy-emitting and super-heavy emitting new cars like Range Rovers and Land Rover Defenders dwarf the EV segment.

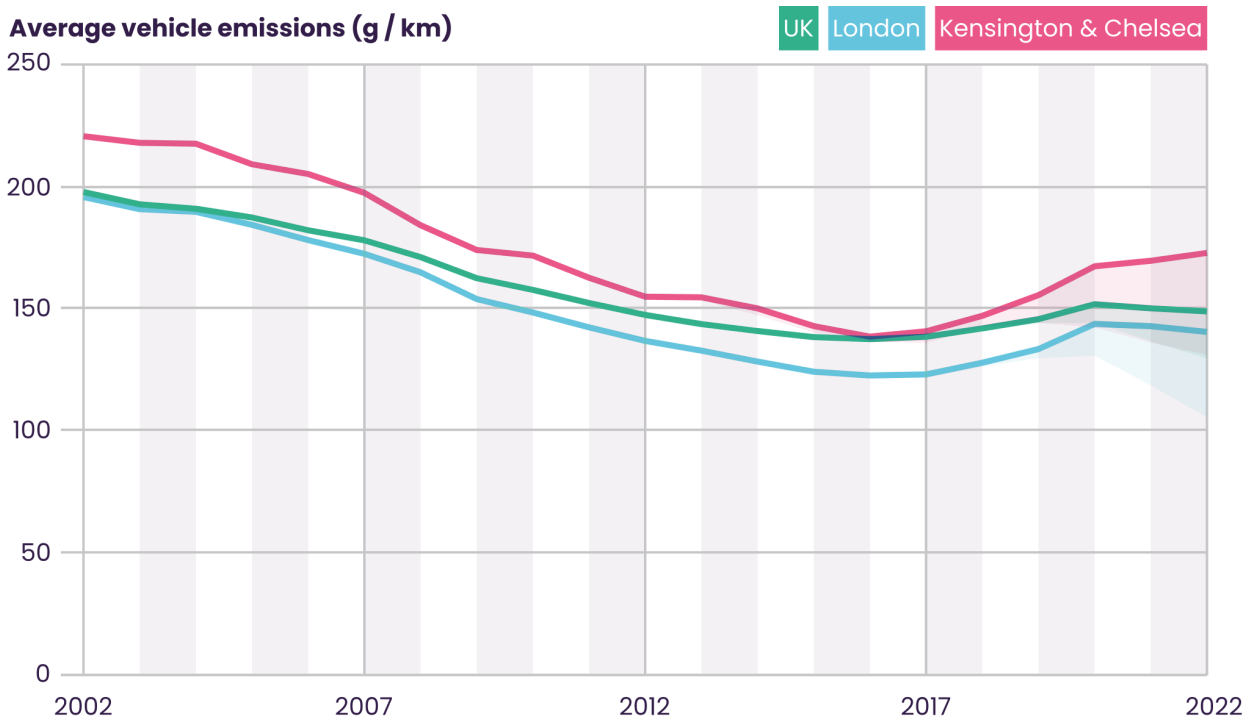

Figure 7. Car emissions are no longer falling if you filter out electric vehicles.

Source: Department for Transport new vehicle licensing statistics 2023 (VEH9901).

Consequently, if we disaggregate EVs from the new car emissions profiles, we can see that at the UK and London levels, the SUV effect means that average car emissions are effectively flatlining - while in RBKC, they are continuing to rise.

The picture here is unfortunately complicated by the changing official methodologies used to assess the greenhouse gas emissions of new vehicles. As the transition from the old NEDC (New European Driving Cycle) test to the new WLTP (Worldwide Harmonised Light Vehicles Test Procedure) test has taken place, a system has been put in place to bridge the gap in official emissions reported by the two test cycles in order

to underpin the approach to vehicle taxation, which is partly based on CO2 emissions.

One component of this was the development of e-NEDC (Equivalent NEDC) which was a figure derived from the WLTP test cycle but adjusted to be comparable with NEDC. The 'Reported' emissions figure in each year was based on NEDC only up to 2017, a mix of NEDC and e-NEDC in 2018, e-NEDC only in 2019, a mix of e-NEDC and WLTP in 2020 and WLTP only from 2021 onwards.

The DfT has published two data sources, VEH0156 and VEH9901[28], showing how new car registration CO2 emissions in the UK have evolved over time. VEH0156 shows average new car CO2 emissions nationally and in each of the devolved nations based on the Reported CO2 figures, as well as disaggregating them into the three different measurement systems where possible. VEH9901 shows average new car CO2 emissions broken down to a more granular, local authority, level and by VED band, but is based solely on the Reported figure.

Below we plot new vehicle emissions as per the new, more robust metrics derived from WLTP tests only, and compare this with the trend in Reported emissions previously used as the official measure.

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https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables

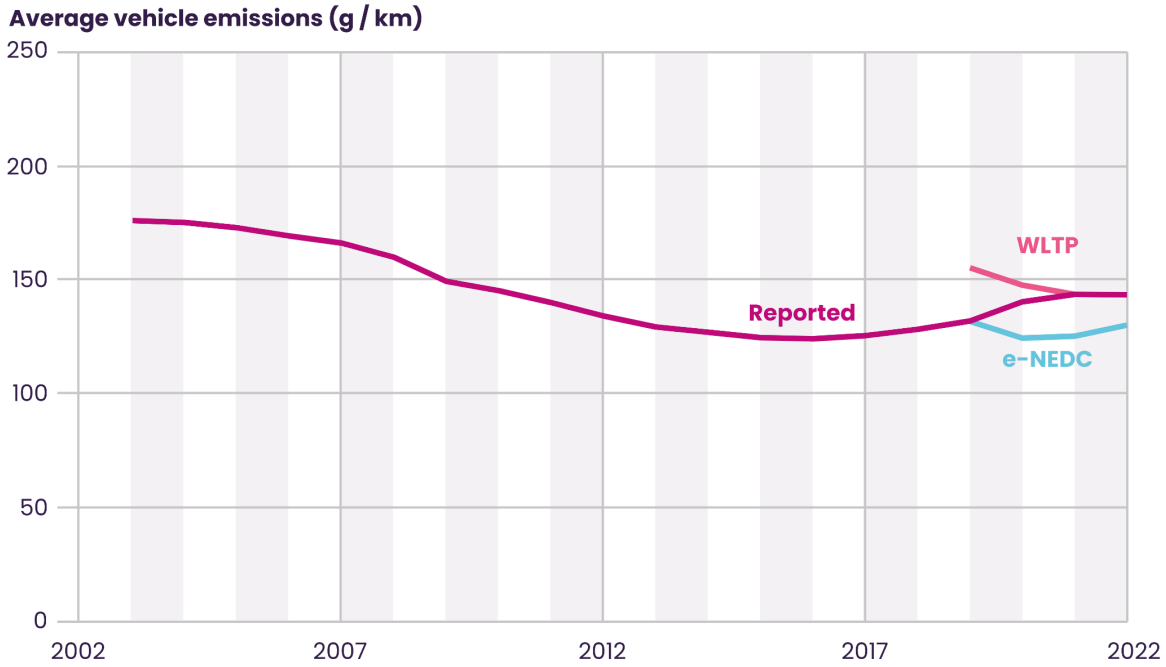

Figure 8. New petrol car CO2 emissions trends, by test methodology.

Source: Department for Transport new vehicle licensing statistics 2023 (VEH0156 and VEH9901).

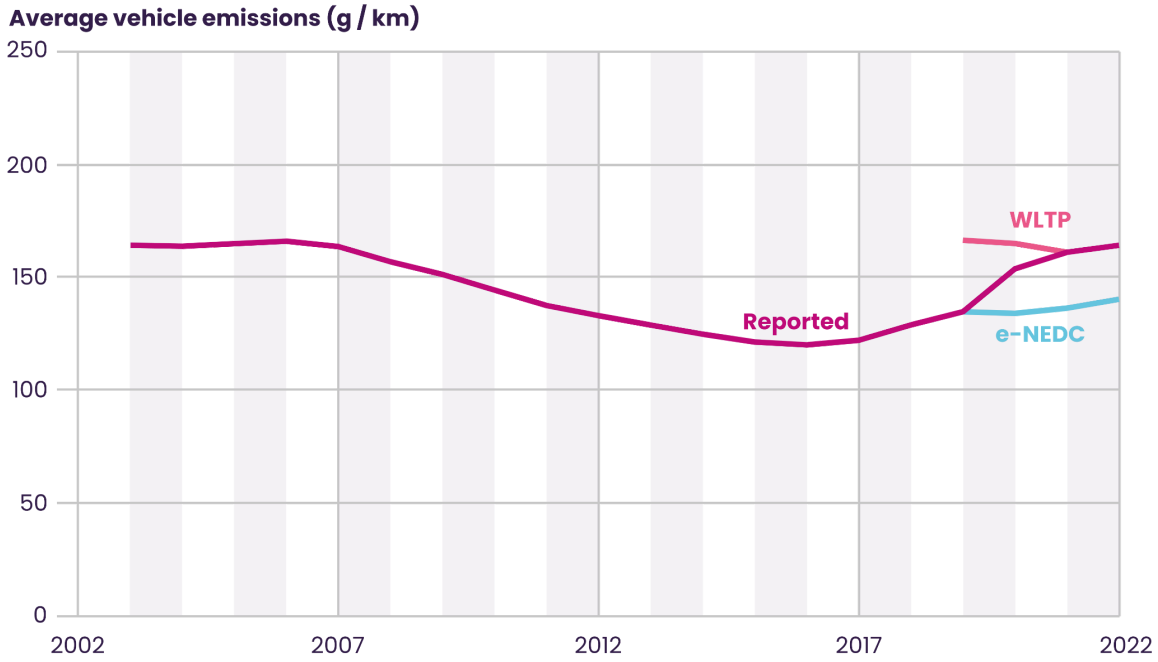

Figure 9. New diesel car CO2 emissions trends, by test methodology.

Source: Department for Transport new vehicle licensing statistics 2023 (VEH0156 and VEH9901).

As shown in figures 8 and 9, the more accurate WLTP testing methodology reveals that average CO2 emissions from new petrol and diesel cars were much higher than official estimates in 2019, but appear to be on a downward trend. Despite this initial difference however, the Reported and the WLTP trends converge from 2021 - showing that by any measure, emissions trends from new petrol cars had effectively flatlined by 2022, and are clearly rising for new diesel cars.

Because only VEH9901 has the granularity to be used for a localised analysis, we have relied on this for the geographical comparisons in this paper, but as it is based on the Reported figure it makes a comparison across the time series difficult. As Reported emissions from 2021 onwards are based purely on WLTP emissions it will be possible to assess trends in internal combustion engine emissions by local authority in the coming years.

Although it is not known for progressive sustainable transport policy, the Royal Borough of Kensington and Chelsea (RBKC) is one of a number of London boroughs that have successfully pioneered emissions-based charging for residents' parking permits[29]. A price of £1 per gCO2/km is applied for each 12 month permit, on top of a base price set to cover the cost of administration (as well as a diesel surcharge)[30]. This is precisely the type of policy approach that has recently been subject

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https://www.transportxtra.com/publications/evolution/news/73773/emissions-based-parking-can-help-cut-car-use-on-the-road-to-net-zero/

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https://www.rbkc.gov.uk/parking-transport-and-streets/residents-parking-and-parking-permits/residents-parking-permits/parking-permit-prices-and-refunds

to attack on the basis of social equity. We obtained data from the first full year of operation of the new charging regime (2021 - 2022) via a Freedom of Information request, to allow us to analyse how residents' cars of different CO2 emissions are distributed across the borough. Unlike the new car registrations national statistics, this data reveals the composition of the residential on-street 'parc' in RBKC - the total fleet of cars that are parked on the roads of the borough by the people who live there.

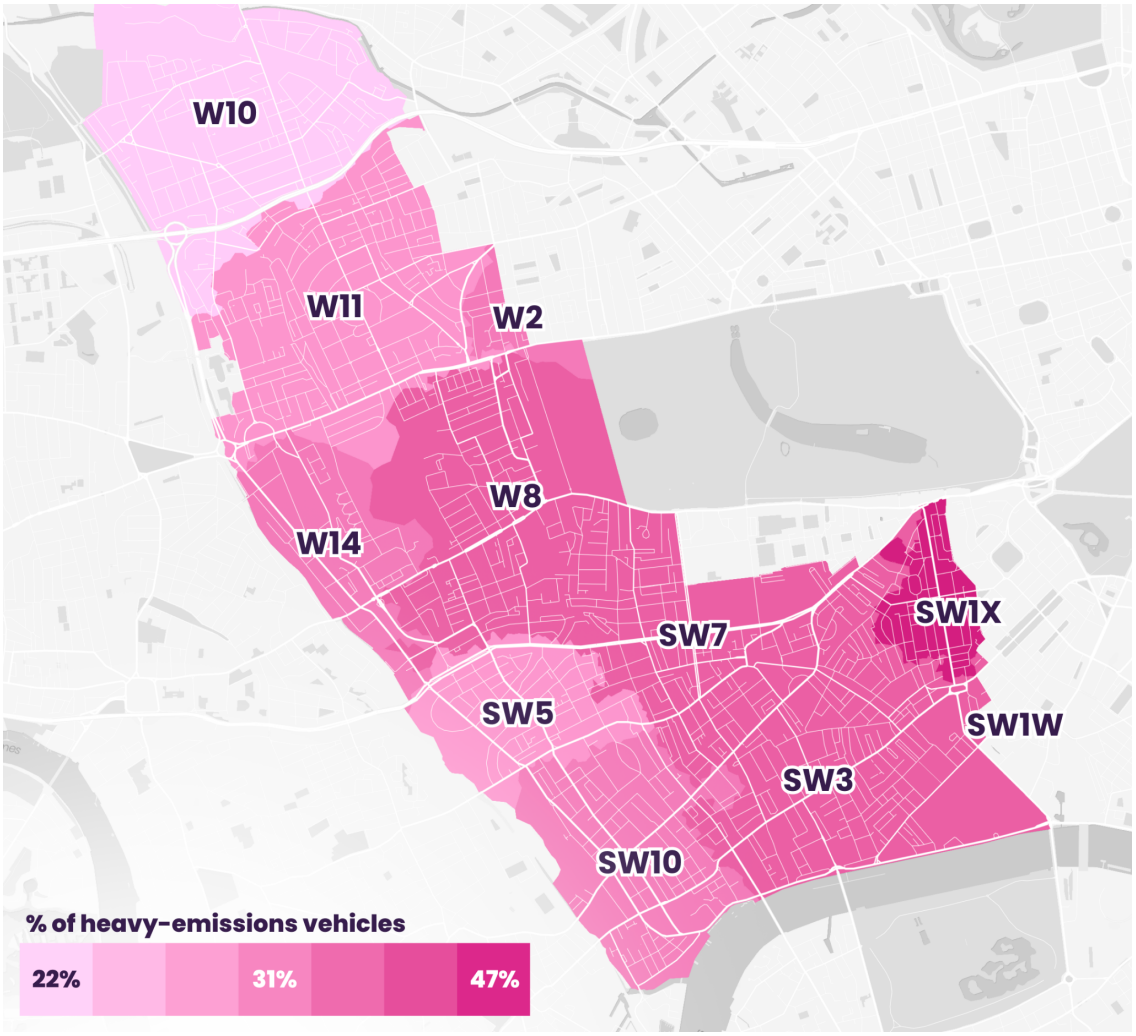

Figure 10. Share of heavy-emissions vehicles (160-220 g/km) owned by residents of Kensington and Chelsea, by postcode district. Source: Residents parking permit database, 2021-2022, via FOI response from RBKC.

We found that residents of postcodes in Chelsea had twice as high a share of high-emissions vehicles as those in North Kensington (where Grenfell Tower is located). SW1X is one of London's most expensive postcode districts[31].

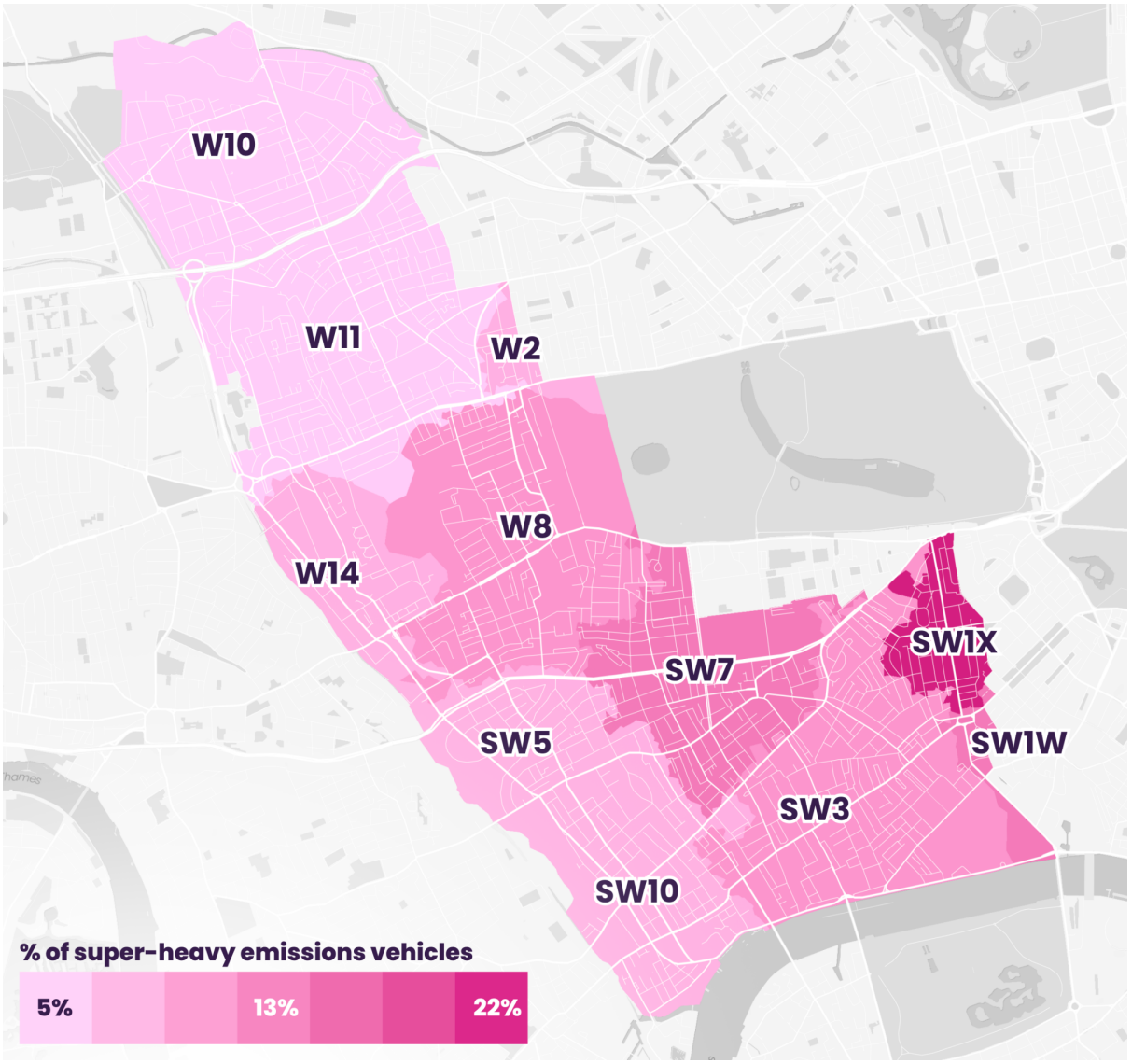

Figure 11. Share of super-heavy-emissions vehicles (>220 g/km) owned by residents of Kensington and Chelsea, by postcode district. Source: Residents parking permit database, 2021-2022, via FOI response from RBKC.

31 https://www.mylondon.news/news/property/londons-10-most-expensive-postcodes-26075215

The contrast is even more stark for super-heavy emissions vehicles like Land Rover Defenders, with nearly a quarter of cars in wealthy SW1X falling into this category, but just one in twenty of those in low-income W10.

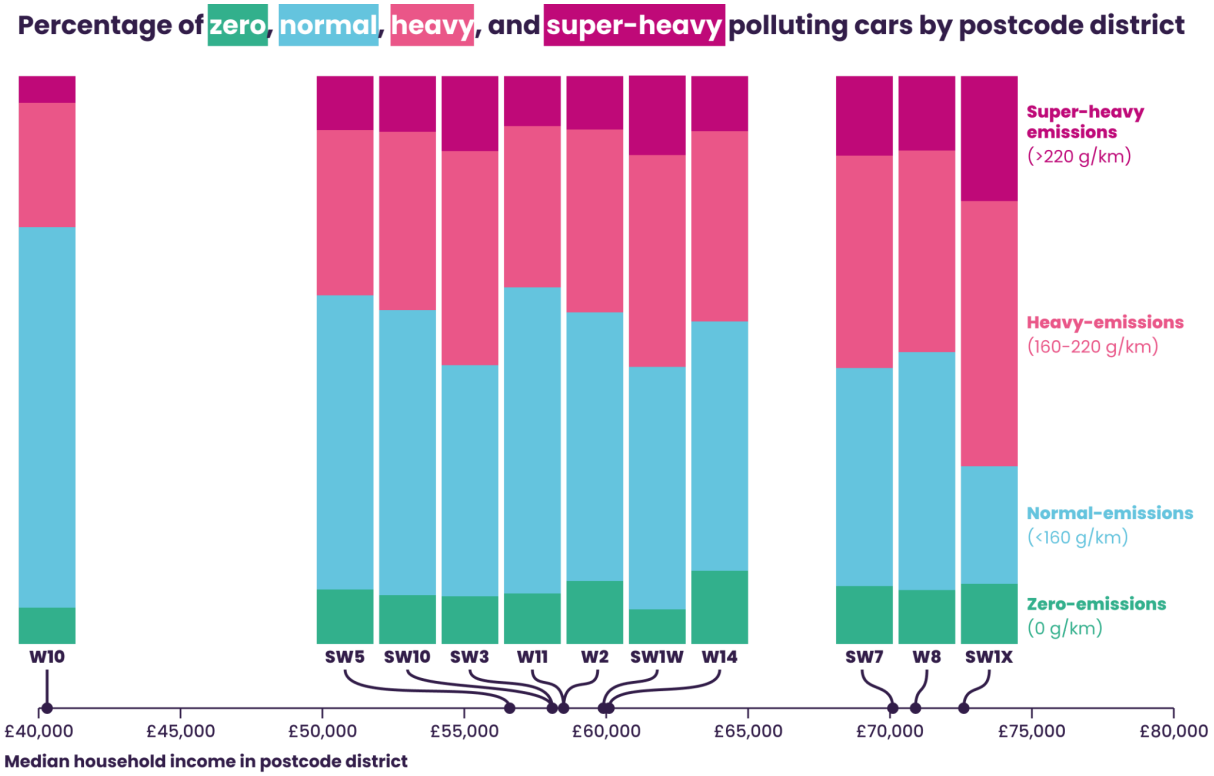

Figure 12. CO2 emissions from vehicles owned by residents of Kensington and Chelsea, by postcode district and median household income.
Source: Residents parking permit database, 2021-2022, via FOI response from Kensington & Chelsea, and Office of National Statistics 2018 small area income data[32].

Plotting our car CO2 emissions categories by postcode district income, we can see that although EVs are marginally more popular in the higher-income postcodes, this effect is relatively small, while cars with

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https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/smallareamodelbasedincomeestimates/financialyearending2018

average emissions only really dominate the fleet mix in low-income outlier W10. Meanwhile the share of high-emissions and super-high-emissions cars climbs steadily with average area income.

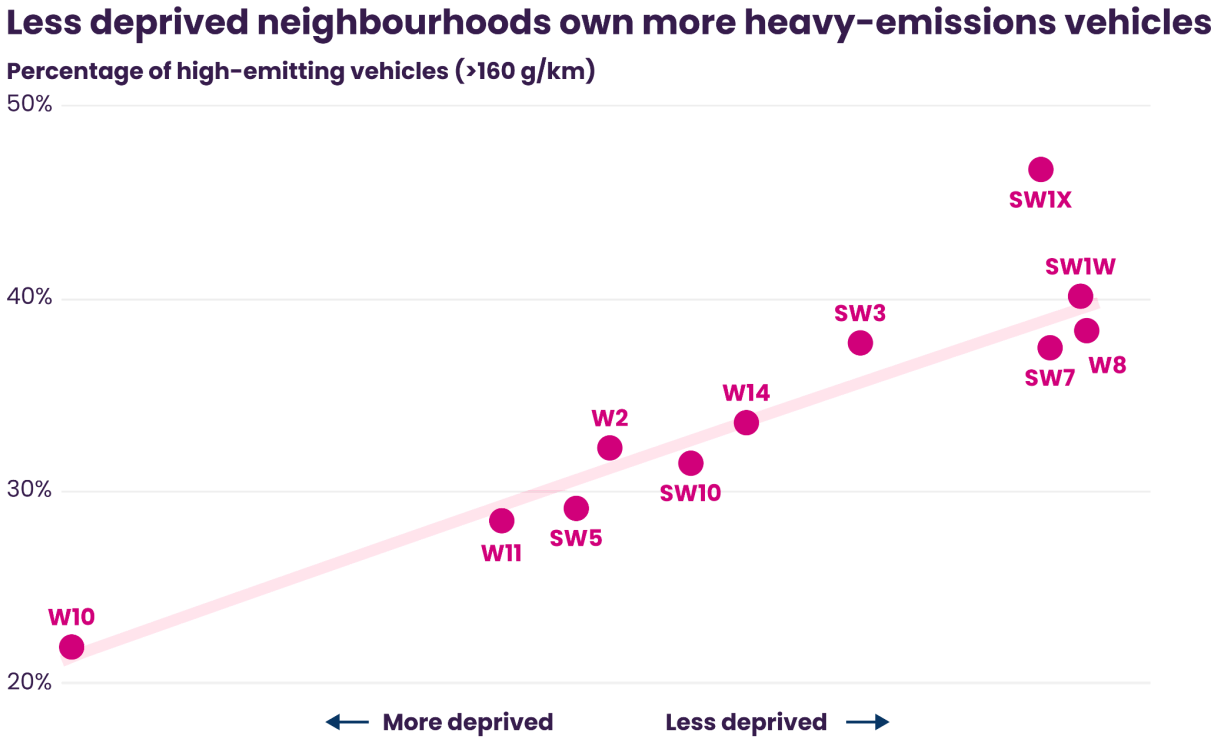

Figure 13. Share of heavy-emission vehicles owned by residents of Kensington and Chelsea, by postcode district and index of multiple deprivation score.
Source: Residents parking permit database, 2021-2022, via FOI response from Kensington & Chelsea, and Office of National Statistics.

If we plot the percentage share of high-emitting cars in each postcode by mean deprivation, we see a clear inverse correlation between deprivation and car CO2. Residents of the least deprived neighbourhoods are choosing to drive much higher emission vehicles than those of more deprived communities nearby.

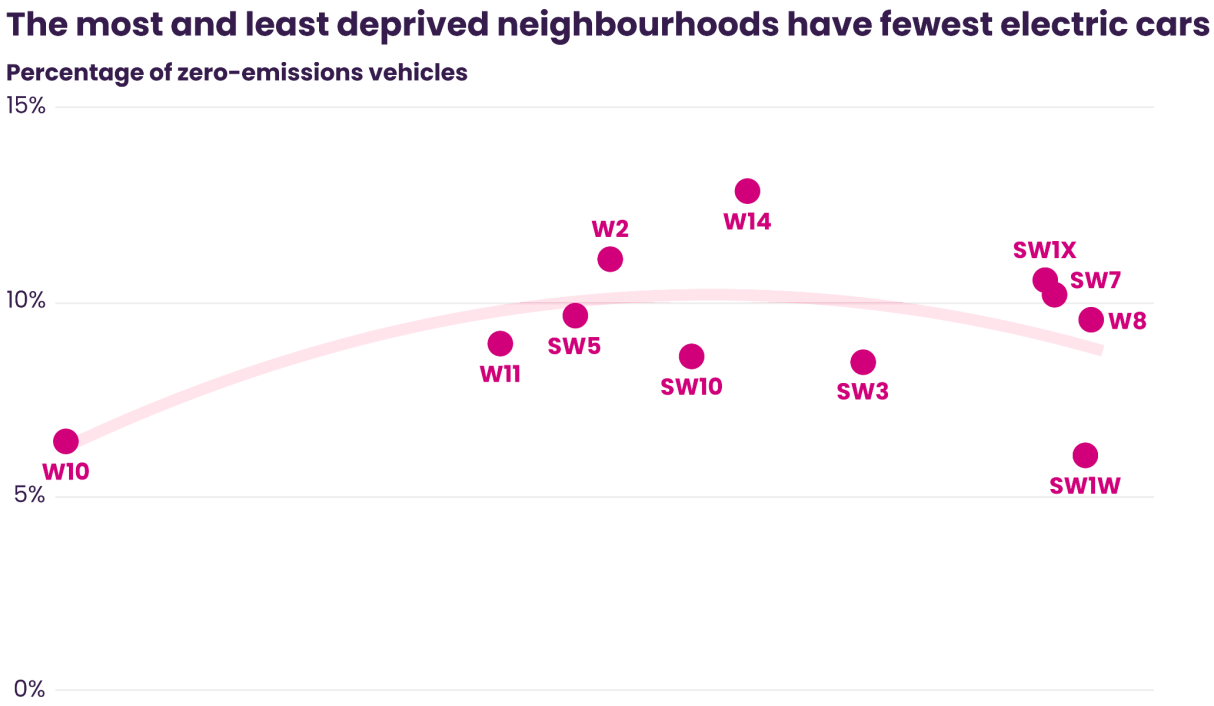

Figure 14. Share of electric vehicles owned by residents of Kensington and Chelsea, by postcode district and index of multiple deprivation score.

Source: Residents parking permit database, 2021-2022, via FOI response from Kensington & Chelsea, and Office of National Statistics.

Intriguingly, although EVs are frequently criticised as playthings of the rich, it is not the super-rich of Chelsea that are most likely to own EVs; it is residents of the middle-income postcodes (albeit within one of the wealthiest boroughs in the whole of the UK).

It is clear from this analysis that RBKC's emissions-based residents' parking charge framework is seeing those who live in the highest income and least deprived postcodes paying far more in parking fees than residents of the lower income parts of the Royal Borough. These charges do not appear to be high enough yet to act as an effective deterrent. Due to the localised prevalence of very large and powerful SUVs in

this wealthy inner West London borough, this disparity may be higher than in other areas of the UK. But wider trends also suggest that higher carbon cars now correlate with higher income car owners.

Cars, cash, carbon

Received wisdom holds that only the rich can afford to drive clean cars, feeding concerns that adopting 'polluter pays' principles in motoring charging could in practice simply mean poorer people paying more.

However, the escalating trend towards larger, heavier cars with more powerful engines over the past decade has seen the assumption that lower income motorists drive higher pollution vehicles become an anachronism - very clearly, in the case of greenhouse gas emissions. In particular, SUV dominance of the luxury end of the new internal combustion engine car market means that there is now a very clear relationship between the price of a new car and the grams of carbon dioxide per kilometre it will emit when in use. This relationship is illustrated in Figure 12 below.

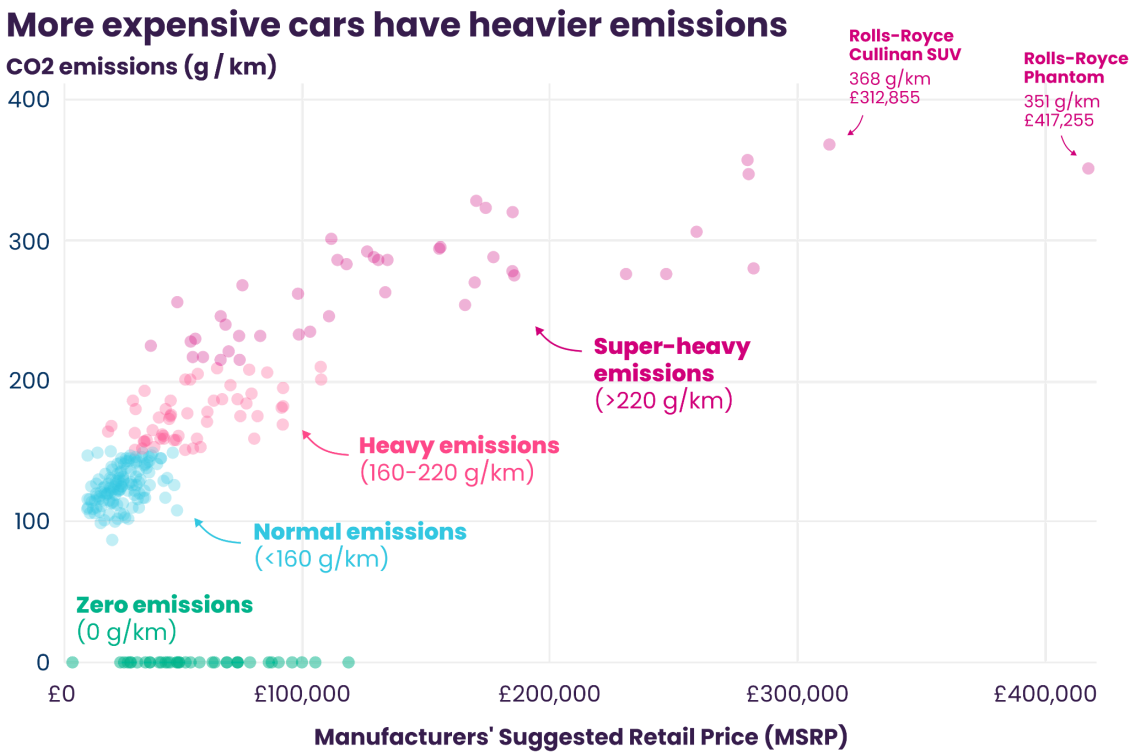

Figure 15. Price of new cars vs gCO2/km, UK market 2023.
Sources: What Car?, Vehicle Certification Agency, manufacturer websites.

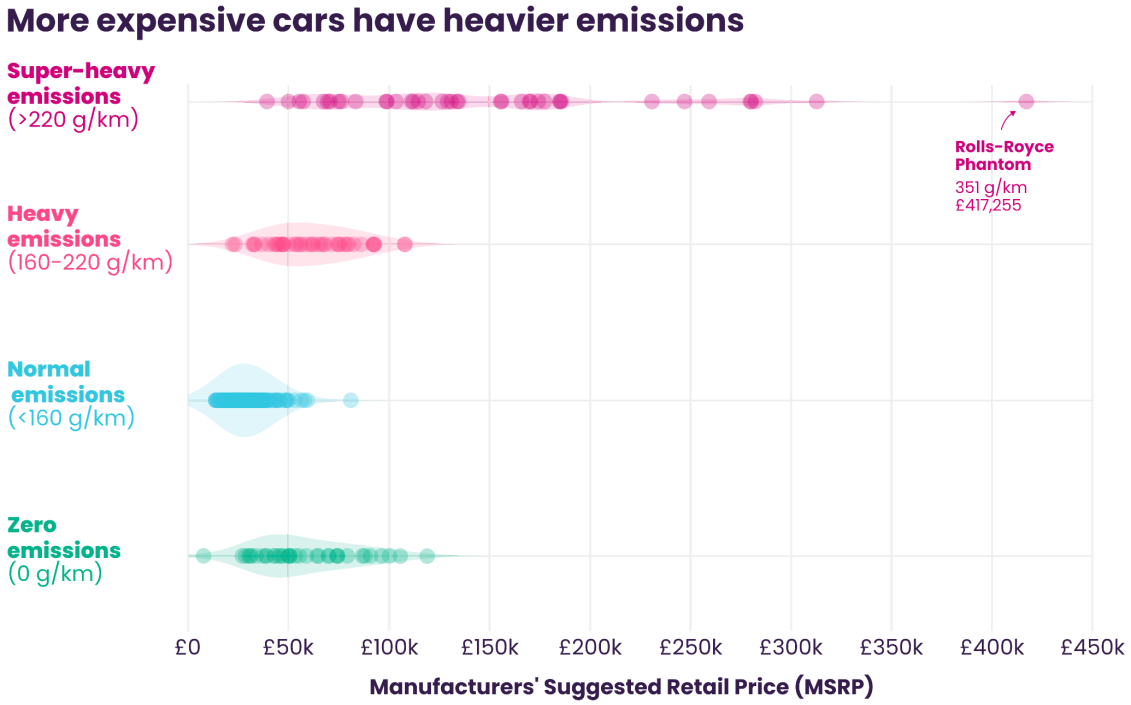

Figure 16. Price of new cars vs gCO_2/km, UK market 2023.
Sources: What Car?, Vehicle Certification Agency, manufacturer websites.

Perhaps unsurprisingly then, our analysis of National Travel Survey statistics on vehicle CO2 emissions by income reveals that those in the top income quintile - the richest fifth of English residents - are 81% more likely to own a super-heavy emitting car (226 gCO_2/km or above) than car-owners in other income groups[33].

Likewise, because of the SUV effect actually increasing the average carbon emissions of new cars sold in the UK in recent years, ICE cars bought in 2013 will on average have lower carbon emissions than ICE cars bought in 2023. Yes, for the avoidance of doubt: ten year old cars are likely to be slightly better for the climate than brand new ICE cars rolling off the production line and onto the UK's roads today. Seven year old cars will have, on average, the lowest gCO2/km in the UK's ICE fleet.

This combination of higher purchase prices for higher CO2 new cars and changes in the average emissions of new cars over time means that in 2023, lower income motorists are now more likely to be driving lower carbon cars than those on higher incomes. Their cars will typically be smaller and have more fuel efficient engines, as well as being substantially older.

When you put this together with the fact that people in the top income quintile drive over three times as many miles each year as those in the bottom income quintile[34], it becomes clear that the carbon impact of the driving habits of the richest may be an order of

[33] Authors' own analysis of National Travel Survey data from 2015-2022.

[34] National Travel Survey (2023), DfT, NTS0705: Average number of trips and miles by household income quintile and mode: England, 2002 onwards

magnitude more damaging to the climate than those of the poorest.

Conclusion

As SUVs have risen to dominate car sales to the richest households, the historic link between low incomes and polluting cars has been broken - and reversed. As a result, social justice arguments against charging motorists according to how much they pollute have been first nullified and then overturned.

There is now just as strong an argument for carbon emissions-based parking and road user charging - particularly targeting the heaviest emitters - on social justice and redistribution grounds as there is on climate grounds. Pricing carbon into car access and parking fees will disproportionately impact the richest motorists. While new charges for private car use are far from being the only things required to meet climate goals - new large scale investment in public transport provision being a notable example not discussed in this paper - they will inevitably be required in some form[35].

Drivers of heavy emitting cars are likely to be people that have the means to buy an electric vehicle which has no tailpipe carbon emissions at all; the retail price of each vehicle class is similar, while super-heavy emitting cars are the most expensive on the market, costing far more than a typical EV. In the midst of a rapidly worsening climate crisis, it should not be controversial to target higher charges at fossil-fuel-hungry vehicles that

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35 https://www.justtransition.scot/publication/can-we-reduce-car-use-fairly/

may be more than three times as damaging to the climate as the average new car, and which are disproportionately owned by those on the highest incomes.

Specifically targeting new charges at the heaviest-emitting vehicles is a policy approach that is likely to be both highly effective in decarbonisation terms, and also highly equitable. Despite falling costs, EVs are still relatively expensive to buy, often meaning they are not yet in reach for those on lower incomes. Higher charges for heavy emitting cars can both raise revenue for public transport and active travel improvements at the same time as incentivising those who can most afford to to switch to EVs faster.

Poor policy design, government indifference and reluctance to intervene in the car industry's business (always framed as 'consumer choice') over the past decade has seen a profit-driven disaster unfold on our streets, one that is costing children's lives as well as accelerating the climate crisis[36]. Road user pricing is urgently needed to plug the growing black hole in treasury revenues from falling fuel duty as EVs grow in popularity. The analysis set out here shows that it can include a crucial element of carbon in its pricing framework, safe in the knowledge that this will disproportionately fall on those who can most easily afford to pay more for the privilege of private motoring.

But we do not need to wait for road user pricing to act; local authorities too have levers to pull, through the fee structures they apply to both short stay parking and to

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https://www.sciencedirect.com/science/article/abs/pii/S0022437522000810?via%3Dihub

residents' parking permits. We therefore recommend that local authorities where a high share of private vehicles are parked on the street, such as Kensington & Chelsea, introduce a new 'heavy-carbon parking surcharge' for the heaviest CO2 emitting cars. This could follow the familiar structure used for income tax bands, with emissions above certain thresholds - 160gCO2/km for heavy- and 220gCO2/km for super-heavy-emitting cars - charged at escalating rates. At the time of writing, Camden Council is consulting on introducing just such a sliding scale for residents' and businesses' parking permits[37].

We all pay the price for excess carbon emissions. But the 'polluter pays' principle can sometimes be challenging to implement in a society that has embedded dependency on high carbon products and activities. When it comes to carbon emissions from cars however, pricing the biggest excesses properly will have few downsides. The Chelsea Tractor has launched an assault on the future, and if we don't fight back fast, we will all find ourselves under its wheels.

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https://consultations.wearecamden.org/supporting-communities/cleaner-fairer-parking/user_uploads/all-parking-products-5.pdf