

<C2>4.17 Is the Future Electric?

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When it comes to decarbonizing transport, local, national and international policy discussions place overwhelming and sometimes exclusive emphasis on technological solutions. Such solutions are largely focused on the electrification of lighter vehicle fleets (cars and vans) and buses, trams and trains. There is an additional, limited role for the sustainable production of hydrogen, biofuels and potentially synthetic liquid fuels in the short term.

The primary limitation of this approach is its inability to keep pace with projected increases in demand for mobility. As economies and populations grow, demand for goods grows, as does the number of people with the desire and means to travel. Globally, total transport activity is expected to more than double¹ by 2050 compared to 2015. This huge rise in the use and ownership of cars, as well as the movements of heavy goods vehicles, aviation and shipping, will more than offset any reductions in emissions from technological change, particularly in the next two, critical decades. It is now widely agreed that there is no way we can meet the decarbonization targets of the Paris Agreement by 2050 without focusing on the amount of movement of people and goods.²

The scale of the challenge comes into sharp focus when our (near-) total dependence on oil – across all forms of passenger and freight transport – is considered. As of 2021, transport is still 95 per cent dependent on oil. Cars, vans and buses tend to stay in circulation for fifteen to twenty years, lorries for around twenty, planes for twenty-five and ships for forty.³ This means that even if, from tomorrow, 100 per cent of new cars and other transport modes were fully electric or fuelled by another renewable source, it would take decades for the fossil fuels

to disappear from this sector. Even an optimistic scenario where global new car sales were 60 per cent electric by the end of this decade would see global CO₂ emissions from cars drop by ‘only’ 14 per cent by 2030⁴ compared to 2018.

As well as the timescales involved, electric vehicles (EVs) are not a panacea, as life-cycle emissions depend heavily on the carbon content of electricity, materials used and battery production. Over the past fifty years, increasing vehicle weight and power have been reducing the rate of efficiency improvements⁵ for cars and vans across the board. The most popular type of car, the large, heavy sports utility vehicle (SUV), made up 45 per cent of all light-duty vehicle sales worldwide in 2021, outselling electric cars by about five to one.⁶ This eroded up to 40 per cent of improvements in fuel economy.⁷ Due to the pandemic, the International Energy Agency reported that carbon emissions in 2020 fell across *all* sectors except for one – SUVs.⁸ Due to the better margins they make on them, manufacturers benefit financially from selling larger, higher-end cars. The US, for instance, incentivizes large EVs by offering emissions credits.⁹ The German government provides direct subsidies for plug-in hybrid electric company cars, many of which are SUVs. Concerningly, many of the statistics published to record the growth in sales of electric vehicles include these plug-in hybrid cars – which make up about a third of global EVs sales¹⁰ – even though they still rely heavily on, and lock in for a long time to come, fossil fuel combustion. One of the fastest, easiest and most efficient methods of reducing emissions would be to restructure incentives to encourage the sale of lighter electric vehicles and to phase out the use of large SUVs in cities immediately: ban their advertising,¹¹ and tax their ownership and use. In the UK alone, phasing out the most polluting large vehicles could cumulatively save about 100 million tonnes of CO₂ by 2050.¹²

There is another, even more fundamental issue with our reliance on electrified transport: it requires a reliable electricity supply, which is simply not guaranteed in many parts of the

world. EVs do not address social inequality within and between countries, especially in the Global South, where e-cars may well be an option only for the powerful and wealthy. And even if they could be made widely available, EVs do not ‘solve’ the problems of road traffic congestion, parking pressures, safety or transport poverty. Car dependence gives rise to urban sprawl and sets in motion a vicious cycle whereby places and jobs become less and less accessible by non-car modes, which leads to subsequent falls in the use of public transport, and in turn reduced revenue and cuts in service levels, resulting in an even greater dependence on cars, and so on. The flipside of the freedom afforded by widespread individual car ownership is that an increasing number of people are being forced to own a car that they struggle to afford and which they maintain at the cost of sacrificing other things in their lives.¹³

So, what can we do? In the shorter term, while the majority of vehicles on the road remain fossil fuelled, a low-hanging fruit is lowering traffic speeds on highways. Introducing a motorway speed limit of 130 kilometres per hour (kph) in speed-loving Germany would lower carbon emissions by 1.9 million tonnes annually.¹⁴ This is more carbon than the total annual emissions of sixty of the lowest-emitting countries.¹⁵ Lowering the speed limit to 100 kph would save around 5.4 million tonnes annually – or more than annual emissions of eighty-six countries, including Nicaragua and Uganda.¹⁶ Yet the debate in the Germany has been going on for decades, with no political party in power prepared to implement the policy. A collective sense of entitlement and dislike of limiting ‘personal choice’ are a lot to blame for this inaction.

The same principle – simply, lowering speed – also has significant potential to reduce emissions in the difficult-to-decarbonize maritime shipping sector, which was not part of the Paris Agreement and which is projected to represent up to 10 per cent of all global emissions by 2050 if left unchecked.¹⁷ Around 80 per cent of global trade is transported across the

oceans on vessels powered by fossil fuels – largely on the most polluting type of fossil diesel. Electrification is not a viable option for these ships – just as it is not for aviation – but the sector has significant potential to reduce emissions through a combination of ‘slow steaming’¹⁸ and retrofitting to use zero-carbon fuels such as green ammonia. A 20 per cent reduction in ship speeds can save about 24 per cent of CO₂.¹⁹

As this indicates, we need significant behavioural change in addition to technological change, and the two are intimately interlinked: political leaders, town planners, manufacturers and consumers need to adapt, enable and promote new travel habits, as well as the adoption of new technologies. When such ‘behaviour change’ in the transport sector is discussed, it is most typically in terms of ‘mode switching’, whereby like-for-like journeys are swapped from inefficient or polluting to more efficient modes of travel: choosing to take local public transport, walk or cycle over making a short car journey. This is clearly an important step: in the UK, for example, 59 per cent of car trips are less than 5 miles in length.²⁰ Walking, cycling and e-biking – or active travel, as it’s called – can reduce emissions relatively quickly.²¹ Alongside active travel, new, lighter forms of e-micromobility are largely becoming cheaper and outselling e-cars in many parts of the world, including sub-Saharan Africa and some parts of Asia, and they have the potential to undertake longer journeys and those outside urban areas.²² Light rail systems have also long provided vital efficient connectivity in large and smaller towns alike and have mostly been electrified since their inception, while buses are some of the fastest components of the transport system to be making the transition to battery technology.²³

There are two main limitations, however, to focusing on high-quality electrified public transport, cycling or walking as the solution. Firstly, in the absence of car restraint policies, car travel will continue to increase alongside any growth in alternative modes. This has been observed in experiments in European countries, where offering free local bus services to all

passengers primarily saw increased uptake among existing users, walkers and cyclists, with a limited effect on reducing car use overall.²⁴ Similarly, car restraint policies were crucial for the Netherlands in achieving its world-leading rates of cycling; it made cycling more convenient than driving.²⁵ Yet even after the success gained by applying a combination of ‘carrots and sticks’ at the local level, average per capita carbon emissions from personal transport in the Netherlands are as high as those in many neighbouring western European countries because car restraint has not been applied to longer-distance car travel, which accounts for most of the mileage and thus carbon emissions.²⁶

Mode switching for the shortest journeys within relatively built-up urban areas is important, but it will take us only a fraction of the way to the reductions in car mileage by 2030 in developed countries that have been identified as necessary to stay within carbon budgets. In the UK, for instance, a lack of any reduction in transport CO₂ since 1990 means that the transport sector now has only ten years left to reduce its emissions by two thirds. Various modelling studies have identified that total car mileage will need to reduce by between 20 per cent and 50 per cent compared to today’s levels even as the uptake of electric vehicle sales is ramped up.²⁷

This level of change requires not just modal shift but ‘destination shifting’ to reduce distances travelled to satisfy the personal or freight journeys undertaken. This is impossible without political approaches that venture far beyond the transport system itself: regional planning policies that locate homes, jobs and services in closer proximity will need to be rolled out to achieve ‘fifteen-’ or ‘twenty-minute neighbourhoods’, putting services such as schools and health care back into urban and suburban areas from which they have often disappeared and sourcing goods and services closer to home.²⁸ Some types of trips will need to be removed altogether: the Covid-19 pandemic has accelerated trends towards virtual meetings, for example, eliminating the need for international business meetings and conferences while

simultaneously increasing participation.²⁹ Meanwhile, other journeys should be consolidated, with vehicles being shared by different passengers and loads – this practice of lift sharing is a large component of less formal modes of transport in many developing countries and has had a resurgence worldwide due to new technology allowing on-demand ride ‘matching’ and shared payment services. Car-sharing schemes are seeing increased growth in many countries where parking pressures and the costs of owning and running a car are high. Focusing on car *access* rather than ownership as a means to unlocking flexible and equitable personal mobility would be one way in which developing countries could avoid the mistakes related to car dependence that developed countries have made.

There is no way round the fact that transport decarbonization means reducing the use of cars, trucks and planes and the simultaneous removal of the fossil fuels from them. To reverse current travel trends and end our reliance on high-carbon infrastructure will require a significant shift in priorities in how we use our land and how we transform our cities. In already car-dependent societies, successful attempts to reduce vehicle miles will need to be followed by a further reallocation of any freed-up road space to the most sustainable modes. Without this, more car and lorry travel is likely to simply fill up the new capacity and quickly erode the benefits. This is not rocket science but it does require serious political leadership, major funding and a clear strategy on how to communicate both the ‘benefits’ and the ‘costs’ of change to society.

Foremost among the benefits is the promise of a fairer society. Transport systems are inherently unequal, and fewer and fewer people are responsible for the majority of the sector’s emissions. In England, for example, just 11 per cent of the population accounts for nearly 44 per cent of total car mileage.³⁰ Globally, 50 per cent of aviation emissions in 2018 were caused by 1 per cent of the world’s population. About 80 per cent of people in the world have never travelled by aeroplane.³¹ If we can change the debate to focus on these current

injustices rather than allowing the narrative to be dominated by supposedly ‘unfair’ policies that ask for a small reduction in motorway speed limits, a redistributive approach to accessibility and mobility could help reduce the resistance to travel demand-side changes. Even without the prospect of climate change, it has been known for decades that many benefits arise from cutting traffic. It’s good for health, safety and air quality; enables more efficient and equitable use of resources; improves social and economic vitality; and makes for better neighbourhoods.

<Endnotes>

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