



HARDMAN & CO.



Cars – generating different attitudes?

By Derek Terrington and William Terrington

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Cars – generating different attitudes?

By Derek Terrington and William Terrington

20 years ago, a young intern at a leading investment bank was asked for his views on the future of the media industry. His published thoughts included the suggestion that his generation never watched TV. This came as a complete shock to the older generation of analysts and fund managers. Could this apply to the car industry?

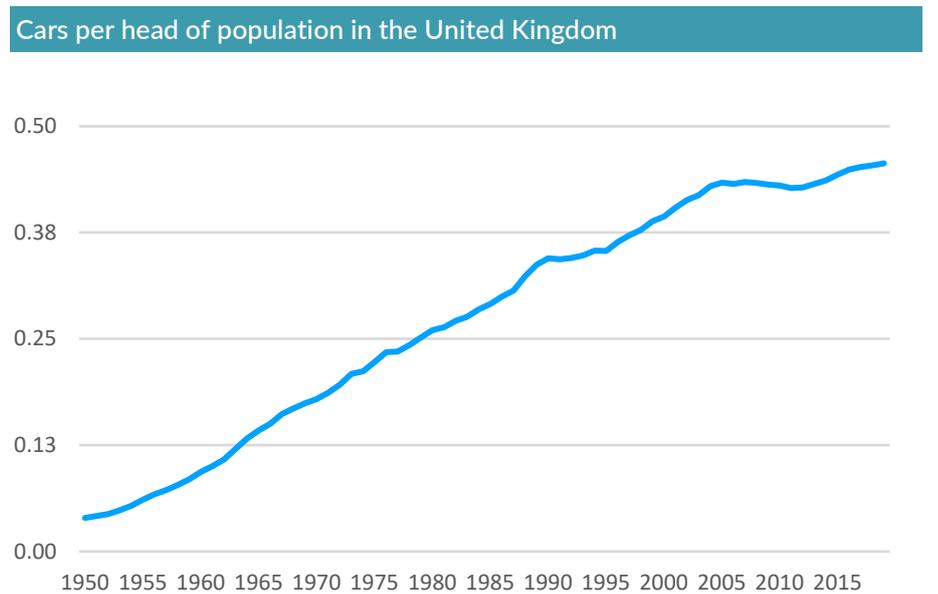
The following article results from an interview between the Hardman & Co analyst, Derek Terrington, and his son, William (age 23). Derek is famous for his research note exposing Robert Maxwell in the 1990s, when he was the leading media analyst at UBS. The note was entitled *Couldn't recommend a purchase*, the acronym of which has been quoted ever since in the City.

The car “culture”

Derek Terrington (DT): *When I was growing up, most of my generation, and that of my parents', thought of the car as the prime object of desire – it was the aspirational consumer good above all others. To the post-War generations, it replaced reliance on crowded, infrequent (and often dirty) public transport, it opened up a new era of go when you feel like it to wherever you want. You could go for day trips to the coast, as well as complete holidays in the car, and getting your shopping wasn't dictated by the bus timetable. Some families graduated from a motorbike (possibly with a sidecar) to a car – the number of motorbikes on UK roads peaked in 1950 at 1.58m and, by 1995, had fallen to just 0.59m.*

It was not only families that loved cars; so did teenagers, and getting a licence, and even a car, was a rite of passage.

You can see just how important the car became if you look at the numbers. The chart below shows the number of cars per head of population.



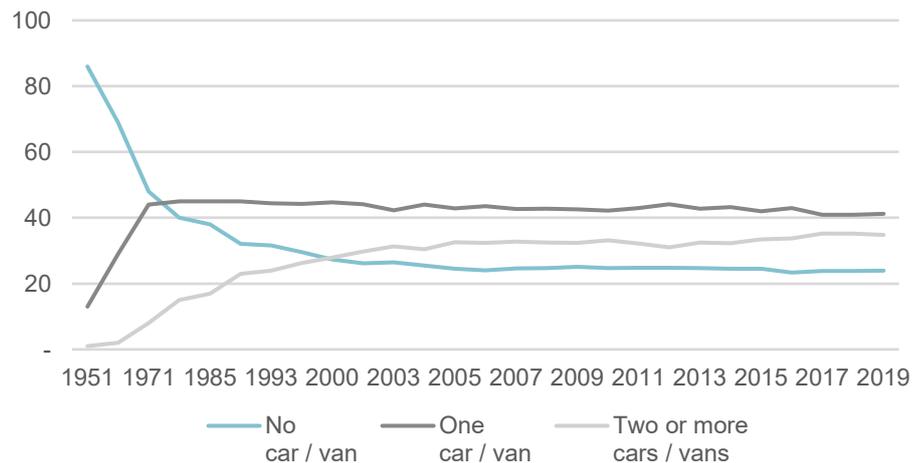
Source: Office for National Statistics, Department for Transport, Hardman & Co Research

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Back in 1950, there was broadly one car per 25 people in the UK. By 2004, there was just short of one car for every head of population.

Looking at the data by household is even more revealing.

Car ownership per household in the UK, %



Source: Department for Transport, Hardman & Co Research

So important was the car to peoples' lives that, once a household had acquired one, they wanted a second! A third of households currently have two cars or more.

For many, cars seemed almost to replace religion. Indeed, some dedicated Sunday mornings to washing the car on the front drive, rather than church worship (granted, back in those days, the paint was so bad that, if you didn't regularly clean and polish, it faded).

William, how does your generation view cars?

William Terrington (WT): Well, the culture around cars is certainly changing, especially among younger people, accompanied by a shift in attitudes to different fuels, which is also a challenge for car manufacturers.

My generation is increasingly concerned about the environment, sees the car as commonplace, rather than an object of desire, and more of a convenience than a badge of respect.

My generation's concern about the environment might lead to the growth of car sharing. Certainly, car sharing has tried to market itself as an eco-friendly alternative to owning a car, especially if you live in a city and do not need one that often, and are not particularly interested in cars, but just want the convenience of one occasionally.

However, over the years, the car has established itself as personal transport, not as public or shared transport. If cars were to be shared, the make and model would be of no particular consequence, so it is rather ironic for premium manufacturers, who make desirable cars for private ownership, to invest in this.

My generation has embraced city living, although COVID-19 might be a test of this theme. People living in cities may move away from car ownership to self-driving cars, car sharing or car hire. For them, the car is just a convenience. Indeed, will they want to own a car at all? These trends reduce the power of branding, and potentially make a highly competitive market even more so. This form of disruption, based upon changing consumer tastes, may be as great an issue for the industry as the move to alternative fuels.

Increasingly, my generation treats the car like a mobile phone – something to be rented, not owned. Car dealers and manufacturers have catered to this approach with personal contract purchase (PCP) schemes, which dress up taking on a large debt as a subscription payment, like Netflix. Despite the fact that PCP significantly raises the price of a car, PCP finance has increased hugely in popularity: the marketing has strongly emphasised the idea of being able to always have the latest model parked on your drive, with no commitment to ownership.

The way the consumer uses the vehicle will dictate the fuel used. We'll talk about fuels later, but hydrogen could be the fuel of choice for longer distances. Meanwhile, electric vehicles (EVs), hybrids and fuel-efficient internal combustion engines (ICEs) could account for most shorter-distance journeys.

The slow death of brands?

DT: Does that mean the car becomes a commoditised convenience, rather than a branded good?

WT: The car is long established as a branded good for private transport. While this remains true at the cheaper “value” end, it has particular force in the performance and luxury car markets, where choosing a car brand remains a question of image and taste for most buyers.

However, for those happy with just sharing a car, there is less interest in the make or model, or having a car as a personal possession.

Some of my generation are excited about driverless cars. These might also turn the car into a convenience. In many driverless concept cars, there are no steering wheels or even front-facing seats. The idea is to get in and tell the car where to go. Driverless cars and car sharing match very well, as they both cater for people who are not interested in cars or car ownership, and for whom make and model are of no particular consequence, as they are not meant to be driven, anyway. BMW's motto revolves around – will they change this to “the ultimate *driven* machine”?

PCP contributes to the car becoming little more than a convenience. In short, the customer can have the latest model every three or four years, with servicing included. This means no commitment to owning and keeping the car as the mileage and maintenance increases. This also allows the customer to obtain a car quicker than saving up for one. This appeals to those who view a car as just a necessity, perhaps for commuting to work. In this case, brands matter less than finding the best deal.

DT: Will, is this a death threat to brands, especially premium brands?

WT: The prestige of premium brands should continue undiminished. Certainly, for premium manufacturers, investing in car sharing and driverless cars might become a conflict of interest. Even PCP might lead to the devaluation of brands. Perhaps PCP finance, car sharing and driverless cars should be left to cheaper manufacturers.

If car sharing, car hire and driverless vehicles were to be the main form of car usage at any time in the future, it would essentially undermine the manufacturers of premium, luxury and performance cars.

These forms of car usage go against what premium manufacturers have been doing for decades: in the simplest of terms, creating desirable automobiles. These schemes do make up 90% of new car sales; however, this is because the vast majority of customers want the latest car as soon as possible. It could be said that this is the same mentality as with purchasing smartphones, as the majority of those are on contract, and even with household appliances, where there are now pay-monthly options. So, PCP seems to be

encouraging the treatment of the car as an appliance or convenience. Some customers may still have brand loyalty; however, for others, price is the main factor. It seems that premium brands will retain their basic strength in future, though, as there are still plenty of cash buyers, and those loyal to brands, and they are currently investing in alternative fuel technologies in order to make sure that they have a stake in the future of the car, whatever it is.

DT: Aren't there already car sharing schemes? Will they increase in popularity?

WT: Yes, there are already car sharing schemes, such as Daimler's Car2go. However, these are for use in fixed areas in cities only, and remain relatively niche, and primarily use hybrids and EVs. The idea of car sharing, however, is simply not practical for use outside of the city. Someone living outside a city needs to have a car of their own. Daimler had started a new initiative with BMW, called "Share Now", yet the scheme is closing down in London, Brussels and other European cities next year.

Sharing the car in cities, let alone anywhere else, is not proving popular. The car is personal transport, and the idea of having to find the car you want to use somewhere on the street with your phone and having to leave it somewhere within the area in which the scheme operates does seem to be making the idea of getting from A to B quite a bit of a chore. Surely a taxi would be much easier? The idea of getting into a car left on the side of the street, last driven by someone you don't know, is clearly not appealing. It is safe to say that this concept worked, in theory, among those planning it, but it fails to take into account basic practicalities. The irony here is that Daimler and BMW invested in a concept where vehicles were not used as cars, but as conveniences, which goes completely against what the likes of top brands Mercedes-Benz and BMW manufacture.

The objective of car sharing is to cater for those who view cars simply as mobility, a convenience. While car sharing schemes may offer a choice of cars, it is quite a basic choice, and is of no particular consequence. Ultimately, the cars might as well be all the same, with no model name and of no marque: these car sharing schemes are clearly aimed at a minority of those, in cities, who do not want ownership of a car and for whom taxi or similar services are not suitable; the kind of people for whom fit and finish, or desirability are irrelevant.

Fuel

DT: William, let's turn now to fuel. Do you think that traditional car manufacturers deal with disruptive changes in powertrain technologies?

WT: Today, around 90% of the world's cars are still powered by the ICE, while manufacturers are investing in alternative powertrain technologies to meet emission targets, without knowing which technology will prevail.

Manufacturers face huge pressure on profits and cashflow from the current downturn and the need to invest in new technologies. Currently, the focus is on EVs but, in spite of the growth in EV production, the fuel question is far from resolved. There are massive issues of cost and environmental matters around batteries, for example. However, we should also allow for improved fuel efficiency in petrol-driven cars in future, as technology develops.

With competing fuel technologies driving the development of cars, the "electrifying" of manufacturers' portfolios is key, but this does not imply producing battery-powered EVs only. The plan for "electrifying" can include some EVs; however, it also includes plug-in hybrids and regular hybrids, which can switch between petrol and electric.

However, the main way in which this is progressing right now is through "mild hybridisation". This is a rather misleading term, given there is no actual electric motor that drives the car. In short, a 48V system powers an electric compressor, which acts faster

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than the turbocharger, increasing power and efficiency. This is the way in which petrol engines are becoming ever more efficient and less polluting, thus undermining EVs, which are still around a third more expensive, and for which charging times are still an issue, as is infrastructure. There are an increasing number of these “mild hybrids” across manufacturers’ portfolios.

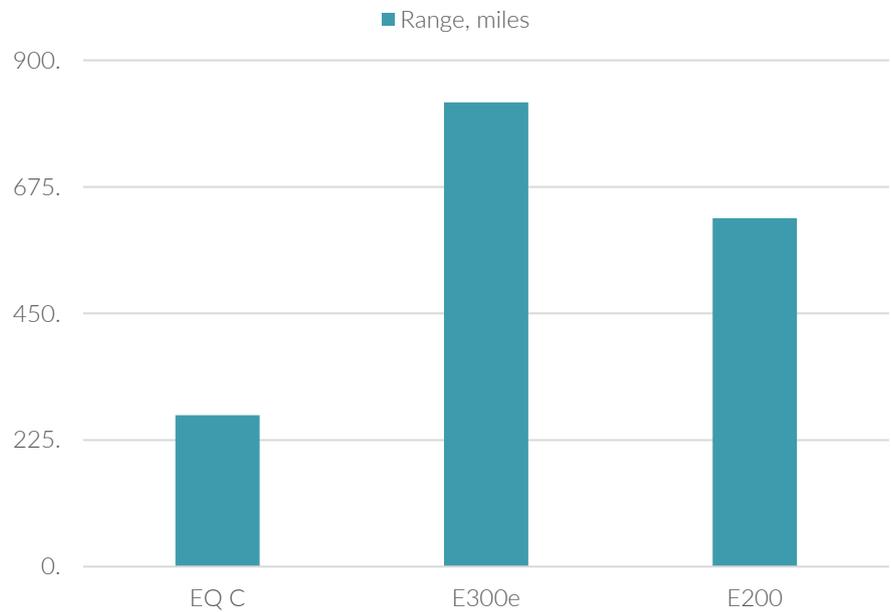
Currently, EVs are viewed as the green alternative, but coming up fast are hydrogen fuel cells, where volumes are quite low at present and where the number of refuelling points is very small. Economies of scale are set to reduce hydrogen costs substantially, and many industry managers and experts view hydrogen as the fuel of the future. Still, investment in hydrogen is not a one-way street. For example, Hyundai invested in hydrogen as early as 2013, but has been held back by the number of refuelling points, and has recently announced investment in two new EV production lines, so that it keeps up with other EV volume producers.

DT: Will battery-powered EVs replace the ICE?

WT: Well, my view differs from most of my generation. I think it is important to consider what a replacement for a petrol engine should be: a vehicle that is as close to a petrol vehicle as is feasible, or even an improvement, if possible, on a petrol vehicle. Battery-powered EV’s do not offer this – if everyone had them, we would all have to charge these cars nearly every night, putting strain on the National Grid, to make sure they had enough battery for the next day. Unless there were to be charging points for every electric car used by a commuter at the car park at work, then, due to the short range (needing increased vigilance in keeping the car topped up), the queues at charging stations at rush hour – rather than petrol or hydrogen stations – would be very long indeed.

At the moment, EVs do not have a range beyond 200-250 miles, which is a fraction, in fact in some instances just a quarter of the range of an ICE car on a full tank of petrol. It should also be mentioned that this figure is a quoted range. In reality, on a stressful winter commute with a de-mister, radio and heating on, the range will be less. The fastest charging time possible for a full charge on the likes of Tesla’s “Supercharger” might be just 75 minutes, but this is still many times longer than it takes to fill up with petrol. To fill up a quarter of a petrol tank takes about a minute. From this perspective, battery-powered EVs are a huge step backwards. It would be wise to consider the expense and environmental impact of making all those vehicles and maintaining all these charging points. In bar chart below are the projected ranges of three Mercedes-Benz cars, the EQ C (fully electric), E300e (petrol plug-in hybrid) and E200 (petrol, “mild hybrid”). The ranges for the hybrid and petrol models were not officially stated; however, this has been worked out by multiplying mpg by tank capacity. The EQ C is the only EV offered by Mercedes, and the E-class is one of the best sellers, used by a wide range of customers.

Comparison of ranges of battery-powered EV vs. petrol PHEV vs. petrol mild hybrid from Mercedes-Benz



Note: PHEV = plug-in hybrid EV; Source: Mercedes-Benz UK

In contrast, hydrogen cars, at the moment, have ranges varying between 300 and 400 miles. This is not in the petrol league, but it is a vast improvement on most battery-powered EVs. In addition, hydrogen cars can be filled up at a filling station in a few minutes, just like petrol, and also do not carry around the extra weight of batteries. But, to repeat, hydrogen fuel points remain scarce today (there are only 13 in the UK today).

DT: Could battery-powered EVs become obsolete?

WT: Mine is not a common view, but I think the answer might be yes.

The weak point in the EV is the battery. Batteries are expensive. They are very heavy and take many times longer to recharge than filling up with petrol or hydrogen, and their lifespan will likely dictate the life of the whole car.

What happens to the car when the battery no longer performs as it should? A battery replacement would not only be very expensive, but environmentally unfriendly. Further, most of the CO2 emissions that an EV causes during its life cycle are at production, chiefly because of battery production, whereas, with petrol cars, emissions are much more spread out over the life of the car.

Also, the key materials – lithium, cobalt and nickel – need to be mined, and they are only to be found in certain parts of the world. Mining these materials brings other concerns, and the price of lithium is very volatile.

In addition, even the lithium-ion battery currently used is being challenged by the development of solid-state batteries. However, it will be some time before these come into production, and their initial price can only be guessed at, given that they are still in development. These batteries will also require materials such as lithium, anyway. If they were to be introduced, they would be expensive, like lithium-ion batteries in cars still are, and the price would take time to come down. That is not going to appeal to many people.

As for propulsion, the developments in “electrifying” manufacturers’ portfolios only seem to be helping petrol cars become more efficient. It is important to note that “electrifying” does not mean making every car a manufacturer produces a non-combustion car. The plan for electrifying can include some EVs. However, it also includes hybrids and “mild hybridisation”.

The backlash against diesel will ultimately work in favour of petrol. For battery-powered electric cars to ever make up a majority of the market, there would still have to be vast amounts of development, and for the discussion around the supply of materials and of safety to vastly improve.

Surely the car of tomorrow should feel just like, or even better than, the car of today? That is what hydrogen and even more efficient petrol engines offer. Before the petrol engine, horses were the main way of getting around: you could ride one when needed, and change horses at intervals on a short trip, rather like getting into a petrol car, ready with fuel in the tank, and refuelling at a petrol station.

Hydrogen is the next-best alternative to petrol; however, extracting hydrogen from natural gas is still an issue. The limit on hydrogen at the moment is the number of filling stations. With the longer-term option of hydrogen, and the limitations of battery-powered EVs, it is difficult to see how battery-powered EVs could replace the combustion engine.

It looks like hydrogen could be the winner in the longer term, but it may not be the right fuel for city driving, where EVs may dominate and increasingly efficient petrol-powered ICEs will generate lower emissions.

It may be that how the consumer uses the vehicle will dictate the fuel used. Hydrogen could be the fuel of choice for longer distances. EVs, hybrids and fuel-efficient ICEs could account for most shorter-distance journeys.

DT: How will consumers and governments respond to changing fuel technologies?

WT: Ultimately, I think future fuel technologies will be decided by the market, not by politicians and scientists. It is a question of which fuel is right for which customer. Due to the limitations in range and the need to have a charging network, it is difficult to see how electric cars are a viable solution outside cities. Installing charging networks not only has its own cost, both environmental and financial, but, if battery-powered EVs were the majority of cars on the road, they would be a large drain on the National Grid. So, it would be better for a family living in the suburbs to have an efficient petrol engine, rather than a battery-powered car. In short, the fuel someone needs will be dictated by what they do for a living and where they live.

The market share of EVs remains small, and manufacturers, in particular the German ones, are generally reluctant to take them on, but are doing so to protect their long-term interests. Jaguar is aiming to have a completely EV portfolio by the early 2020s, although this is at odds with other British manufacturers, and would take it out of competition with the German manufacturers, so it is unclear as yet how any marque would make a reasonable profit by converting to EV-only. Tesla is (perhaps) an exception, as it was originally electric, anyway.

The range of battery-powered EVs is barely beyond that of a quarter of a tank in a petrol car, and the challenge of installing an infrastructure to support far more electric cars than we have now is a huge undertaking, and would have its own environmental cost.

To meet the UK government’s plan to decarbonise the economy by 2050, it is proposed to halt the sales of new petrol, diesel and hybrid models by 2035 (the earlier target was 2040). Is this feasible? The AA has warned that there may not be an adequate supply of suitable zero-emission cars by this date. The inclusion of hybrid cars in the ban makes the target hugely demanding.

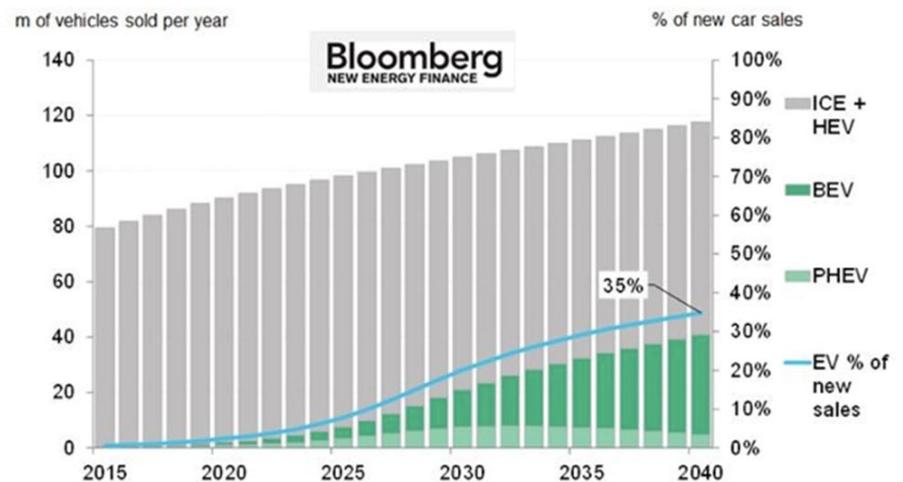
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As discussed above, battery-powered cars are a huge step backwards from petrol cars. To go from the cars of today, which are still pretty much all petrol and diesel, to none at all in 15 years is simply impossible. In 2019, battery EVs accounted for just 1.6% of the UK market, compared with 4.2% for hybrids, 25.2% for diesels and 64.8% for petrol.

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The table below from Bloomberg shows the global picture.

Projected global sales of various powertrains



Note: BEV = battery-powered electric vehicles; ICE = internal combustion engine; HEV = hybrid EV; PHEV = plug-in hybrid EV. Source: Bloomberg

Even if this policy were implemented, petrol stations would still have to be around for decades to come, to support the millions of petrol and diesel cars on the road, and the environmental impact of scrapping millions of petrol and diesel cars, with plenty of miles left in them, would be considerable.

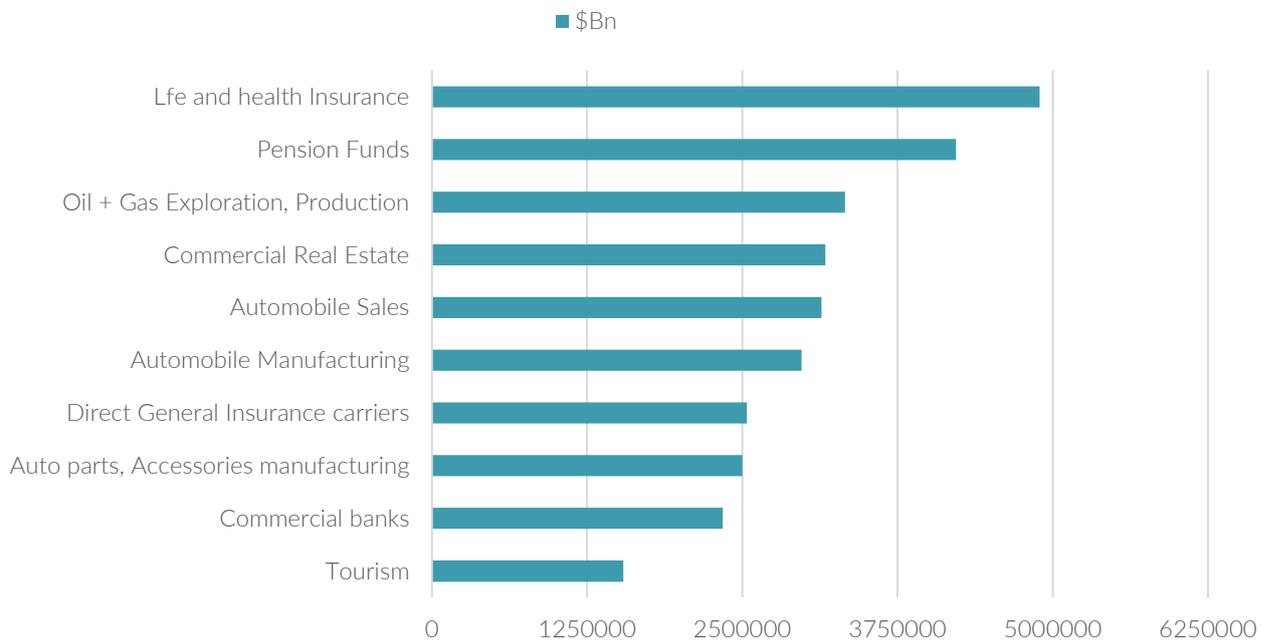
In short, this policy is the same kind of mistake as was the policy to encourage more people to buy diesel. Diesel was never an appropriate fuel for most drivers in the first place: this is a fuel suited to HGVs and towing heavy loads – it was always unnecessary for shopping and the school run. Similarly, and to an even greater extent, battery-powered vehicles cater for very few. The government's target for de-carbonisation is unrealistic and potentially damaging to the car industry. I think this policy is unachievable.

DT: How important is all of this to the global economy?

WT: Car manufacturing (including parts and accessories) is the largest industry in the world, just ahead of life insurance. Pre-virus estimates suggest that its total revenues will amount to \$5.5tr in 2020; manufacturing alone accounts for \$3tr of this (see table below).

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Top 10 largest industries globally by revenue



Source: Source: IBIS World

Globally, 90m cars were sold in 2019, but this is forecast to fall 20% to 72m in 2020, compared with a pre-COVID forecast of 91m¹. Currently, the industry is being hit by both the COVID-19-based fall in demand and by disruptive technological changes. Most leading companies have issued profit warnings.

Environmental concerns are driving diesel to the margins and opening up the market for new fuel technologies. New entrants (Google, Amazon) threaten long-established players with new ideas about how cars should be powered and how they will be used by consumers in the future.

Around the turn of the 20th century, cars were powered mainly by petrol, but there were alternatives with battery- and steam-powered vehicles; for example, the Baker-Electric, and the Doble Steam car.

¹ Global Automotive Outlook and Trends: 2020 and Beyond, Counterpoint Research. <https://www.counterpointresearch.com/global-automotive-outlook-trends-2020-beyond/>

Baker Electric



Source: Wikimedia Commons

Doble Steam Car



Source: Wikimedia Commons

Then along came cheap oil, which wiped out all competing powertrains (as we now call them). Now, electricity is once again presenting itself as an alternative to gasoline, but it is not cheap, and some basic environmental issues still have to be resolved.

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The biggest causes of disruption in the industry reduce to:

- ▶ political demands from governments that support de-carbonising and want to aim for carbon neutrality by a specific date;
- ▶ technical questions of choosing the powertrains (ICEs, EVs, hybrids) that deliver cost-effective solutions for the consumer;
- ▶ behavioural issues – will younger people (especially those living in cities) use individual transport, care about cars, and will they buy or hire; and
- ▶ understanding driverless cars – will they be allowed and what are the implications if they are.

DT: *How do you think future propulsion technologies will be decided?*

WT: *At the moment, forecasts for EV sales are very optimistic. Bloomberg expects EVs to account for 35% of total car sales by 2040.*

But it is possible that the idea of the battery-powered EV could be phased out or simply not progress from being a niche product. Hydrogen/fuel cell cars can be filled up at a “petrol” station with hydrogen, and do not carry around heavy, slowly degenerating batteries; they offer zero emissions, but with the convenience that petrol cars have given us. The market share for battery-powered EVs has grown, but is likely to plateau if there is not enough infrastructure for electric cars. The number of charging points in cities is undoubtedly increasing; however, in a city, it is much easier to install such networks. To try and install these across the country is a huge undertaking.

Manufacturers are taking different approaches to electric cars: a few are making electric versions of well-established models, while the majority are making battery-powered vehicles in separate ranges. High-performance petrol cars are very important to the German car industry, in particular, so it is unlikely they would want to do away with petrol entirely. At this point, it seems as if the future will be dominated by very efficient petrol engines, with diesel, EVs and hydrogen cars as alternatives, but with hydrogen as a long-term winner.

For electric cars, many adverts and manufacturers’ websites try to portray a 200-250 mile range as some compelling reason to buy one, yet this is the range of about a quarter of a tank of petrol. And, according to the company itself, the range of the current crop of Tesla models is between 314 miles and 379 miles.

It is optimistically claimed that networks for fast chargers are easily available, when this is really not the case: fast chargers do not have capacity for more than 3,500 vehicles. Otherwise, charging is extremely slow, and unless a difficult-to-locate charging point is found, it has to be done at home. Plus, if an electric car runs out of power, it will have to be towed to the nearest charging point. So, electric cars are probably not useful for anything other than commuting, and preferably city commuting. They are most likely to be used for short trips. They will not be useful for going on holiday.

Purchase price is another issue: electric cars still cost around a third more than a petrol equivalent with the same amount of output. Electric cars, at the moment, have nothing to pay in road tax, while to use charging points can require subscriptions and individual charges, not to mention the cost of installing a fast charger at home.

Road tax would have to increase if the majority of consumers switched to these cars. Presumably the government would start to apply rates similar to those of ICE cars, in order to pay for the maintenance of highways and infrastructure. Putting this together with the aforementioned issues does not make battery-powered electric cars a better proposition than the combustion engine, at least in the vast majority of applications. The

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fact that these cars produce no CO2 when being driven has become the all-consuming factor, a stance that cannot last forever.

DT: *I've got to ask you whether you think Tesla will prosper in the future?*

WT: *At the moment, Tesla is the sole EV-only manufacturer and offers a comprehensive range of electric cars. The German manufacturers are very cautious about battery-powered EVs, only offering a few electric vehicles as an aside from their petrol and diesel cars. If, tomorrow, German manufacturers were to offer complete ranges of electric cars, it is probable Tesla would struggle, and might go back to being very niche, as it was in the 2000s.*

Tesla's sales are still tiny compared with German manufacturers, anyway. Even now, Tesla cars are a long way from mainstream. In the first half of 2020, total EV sales in the German new car market were 44,307, giving a market share of 3.7%, a number flattered by a 35% fall in total German car sales in the same period. Boosted by government subsidies, German manufacturers invested heavily in EVs, and leading German brands dominated the domestic EV market. Of those 44,307 EVs, just 5,103 were from Tesla.

German manufacturers, in particular, have taken advantage of the improvements in electronics, and this has only helped to make petrol even more efficient, especially with what is known as "mild hybridisation" (see above). With these advancements in petrol engines, and with the availability of hybrids, some of which can run electric-only for short periods, the case for the battery-powered car becomes less compelling. In short, Tesla's future is not guaranteed.

Conclusion

DT: *So, to wrap this up, has the car culture changed, and has the fuel of the future been decided?*

WT: *Yes, I think my generation's attitude to cars is different from yours in several ways, but the answer to the second question is no. The orthodoxy is that EVs have won. I don't think it will be that simple and that hydrogen, and ever-more efficient petrol engines and plug-in hybrids, could be coming up from behind.*

About the authors



Derek Terrington is responsible for covering media stocks at Hardman & Co.

He has more than 30 years' experience in the City, and was rated top analyst in the Institutional Investor Survey for the Publishing sector for four years from 1988 to 1991. He has worked at leading City brokers and financial institutions, and was Head of Media Research at UBS, KBS and Commerzbank, as well as Partner and Head of Research at Teather & Greenwood. On the buy side, he has been a media analyst at AXA Fund Managers.

Derek joined Hardman & Co in 2013. He is a graduate of the University of Cape Town, with an MA in Economics, and is an FRSA.



William Terrington is a graduate of Birkbeck, University of London, with a BA in French and German.

He is also a motoring journalist for Mercedes Enthusiast magazine, has a sound knowledge of the automotive industry, specialising in the German marques, and always keeps current on the latest developments in technology and powertrains.

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