



Electric vehicles & Internal Combustion engine: Key facts they forget to tell you

By John Cooper

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ith now about 0.15% of vehicles on Europe's roads being powered by batteries, there are suddenly many offering the view that the end of the internal combustion engine is just around the corner, killed off by affordable zero emission electric cars.

This is justified by pointing at the announcements of several carmakers who are introducing new plug-in models, and by Tesla who took 400,000 deposits for their next new model. We are told that battery costs have come down and that the cars will be a cost effective way of reducing CO₂ emissions.

Indeed it is true that carmakers are investing heavily in electrification technologies, but a closer look at the causes of these announcements reveals some surprises, that can lead to a different conclusion about the future of the ICE.

Electric Vehicles currently serve to meet the targets and escape penalties

Firstly car makers have to comply with increasingly tough CO₂ standards, falling from 130g/km today to 95g/km in 2021, and with proposals for that to fall to 70g/km in 2025 or 2030. In this regulation all electricity is - amazingly - treated as zero carbon, which has the result that, as the target gets lower and they meet the limits of efficiency improvements, carmakers are forced to sell more and more EVs to comply, picking up as many artificial zeros as possible to reduce their fleet average. If they don't comply they are fined for every vehicle at a rate of around €475 per tonne of CO₂.

There are no zero emissions vehicles on a life-cycle basis - the risk of misleading consumers

Of course electricity is not zero emissions, but that is not the only problem hidden by this regulation.

If one looks at the CO₂ emission from the vehicle manufacture, (shown by highly credible university studies)

we see that the manufacture and recycling of the batteries is so high in CO₂ emission, that for the EVs currently on the road, the cumulative savings from manufacture, use and recycling are far lower than that predicted by the Car CO₂ test, and for many thousands of EVs, there have been no life-cycle GHG savings at all. Consumers and citizens believing they are driving a zero emissions car are also misled by such regulation.

So the regulation and test that forces the carmakers to invest in electrification simply does not represent reality of the life-cycle, and given that battery materials extraction and manufacture may be outside of Europe, it could be seen as a regulation that causes export of emissions, rather than outright reduction. One has to question whether the European car industry with its huge number of skilled jobs, is being wisely guided by such a regulation.

The story on affordability also has an unexpected twist. Whilst battery costs are coming down, NGOs are calling for more incentives to help increase EV sales. Today in most countries there is a purchase grant of around €5000 per car, then there is an exemption from any excise fuel or road tax whilst using the car - equivalent to another €5000 of incentive. That's at least €10K in incentives per car even before you take into account daily exemption from some tolls or free parking. Given that full-life CO₂ savings appear to, at best, maybe 5 tonnes per car, that gives the societal cost of GHG reduction at least at €1000 per tonne, and possibly much much more! A power station burning coal pays a carbon price of just €4 today. Why such an enormous difference?

It is also worth reflecting that at the same rate of subsidy, the cost to turn over the whole EU fleet of 250 million cars to EVs would be a staggering €2.5 Trillion, or 15 times the EU budget. One surely has to draw the conclusion that electrification of transport is set to disappoint as the true picture emerges, and that the push to wholesale electrification is simply too early.

Impact on Citizens

The customer take-up for EVs is still very small, because it seems, they do not see the EV as an equivalent offer to replace a petrol or diesel vehicle. Better range and more

charging points will help, but what of the family that can only afford to spend €7000 on a car? They will be buying used petrol and diesel cars for many years, and they may be paying higher taxes to cross-subsidise users of EVs who pay no vehicle or fuel taxes. Evidence also shows that the range of the EV falls with age, how will that impact the second or third user of an EV car?

The Future of the Internal Combustion Engine

Meanwhile the internal combustion engine is being improved and complemented in three important ways that prepare it for the future:

- Efficiency: leading academics in the field tell us that there is indeed further development potential in the ICE, both petrol and diesel, whilst also meeting stringent air quality regulation. This will complement vehicle “light weighting” to further reduce CO₂ emissions of the vehicle.
- Fuels: the Commission is asking the fuels industry to blend sustainable renewable fuels, giving a reduction in the GHG intensity of the energy. This will also bring down the real CO₂ emissions from the fleet average of each of the carmakers, and of course will benefit all vehicles on the road, not just new registrations each year. With the right policy support, further technologies to improve fuels are also possible.
- Electrification and hybridisation: Yes - partial electrification of vehicles, including hybridisation and plug-in hybrids,

can clearly be complementary to the ICE, giving very practical vehicles, with lower real life-cycle CO₂ emissions, avoiding the financial and carbon costs, and weight penalty of larger batteries.

These technologies complementing the ICE can give real and more cost effective reduction in CO₂ emissions in cars, for many years to come. Furthermore, these technologies are also usable in the many other sectors that use ICEs, and finally Europe’s automotive products will be highly competitive in markets outside of Europe where such high levels of incentives are not available.

The current CO₂ in Cars regulation has been very successful in bringing real efficiency improvements in cars. But it now risks misleading the car industry into premature electrification, whilst other technologies are left unsupported and undeveloped. FuelsEurope proposes a thorough review of this vehicle regulation to ensure that consumers and the planet each get a better deal.

Meeting the global Paris targets is important, but we need transparency and a fair comparison between all technologies to find the most cost effective ways to do this, including longer term, a way to converge the carbon prices in our economy. If we do this, it appears that the internal combustion engine, with liquid fuels, can indeed be part of the solution for the longer term.

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