

UK Air Quality

The Myth of the “Green” Electric Car

We are living through a period of quite dramatic change in many technologies. Not the least of these is the move towards new power technology for personal transport.

Just a century ago personal transport options were all but unavailable to almost all of the UK population, but as the last century progressed, everyday folk gained greater and greater access to affordable personal transport. Effectively most such people bypassed horse and even horse and cart or gig straight to horseless carriage.

We have seen a huge boom in ownership and use of personal transport, particularly since the Second World War; first with ownership of petrol-powered vehicles and then in the last quarter century, the rise in popularity of diesel-powered vehicles. The number of cars has risen from just 2 million in 1950 to over 31 million today (diesel-powered now constituting 40% of the fleet of cars compared to only 7% in 1994).

At the same time as this boom in ownership and use of personal transport has taken place, so our air quality has dramatically and steadily improved from the early post war recent low (mostly caused by coal burning for home heating and cooking and electricity generation).

And yet we hear endless wailing and gnashing of teeth from certain quarters about the terrible air quality and deaths (“premature” or otherwise) caused by this air quality, despite improvement in life expectancy in that time.

As those decades have passed we have also been told of the wonderful opportunities afforded by the electric car (and previously endless cheap electricity to power and heat our homes). Well the latter never quite materialised, but the time for the former has finally arrived and it is now a real and almost practical option for most people.

There remain several significant infrastructure hurdles to overcome between now and the 2040 (and beyond) “ban” on the sale of new petrol and diesel powered cars; availability of charging points and, of course, the need to massively increase electricity-generating capacity, let alone improved speed of charging and battery capacity.

These issues are all solvable over time (though speed of charging might prove to be a challenge), just as the technology to extract oil, and the growth in fuel refinement, production and distribution kept pace with the growing demand from the ever-wealthier western consumers for personal transport.

There remains one deeply intractable problem that makes the idea of the “green” electric car a myth; namely electricity generation technologies.

Using a mix of current generation technology we find that far from being any “greener” than petrol or diesel powered cars, electric cars are in fact “better” in one respect and worse in another, at least nationally.

Using Chris Lilly’s “Next Green Car” analysis and web site as a primary source of data (<https://www.nextgreencar.com>), we can see that more-or-less like for like comparisons of class of current car, yields CO₂ and NO_x (plus PM’s) per kilometre driven (calculating for 5,000 miles per year, in real world conditions with a normal driving style):

Model	Fuel	g CO ₂	mfr	upstream	tailpipe	mg NO _x +PMs	mfr	upstream	tailpipe
Jaguar XF 3.0 V6 RWD Auto	Diesel	280	34	45	203	344	93	102	150
Porsche Cayman 2.0 PDK	Petrol	258	26	45	188	214	73	113	27
Tesla S 100D	Electric	159	53	106	0	414	108	307	0
Tesla S 75D	Electric	152	52	99	0	393	106	287	0
Nissan Micra 1.5 dCi Visia	Diesel	168	21	36	121	267	57	61	149
Nissan Micra 1.0 Visia	Petrol	200	20	35	147	171	56	88	27
Nissan Leaf 24	Electric	110	37	72	0	285	76	209	0
Nissan Leaf 30	Electric	110	38	72	0	286	77	209	0
Nissan Leaf 40	Electric	109	39	70	0	281	78	203	0

Note these calculations DO NOT include roadside particulate emissions from road surface, tyre or brake wear, nor emissions from the end-of-life of vehicle scrap, recycling and waste management.

Note also that I have secondarily calculated upstream electricity generation emissions from several sources based on various generation technologies and the results fully verify those from NGC.

See also the NGC methodology for more information here (<https://www.nextgreencar.com/content/NGC-Emissions-Calculator-Methodology-2016-v2-3.pdf>).

From this analysis we see clearly that there is a general CO₂ advantage per mile or kilometre driven for electrically/battery-powered cars (between 60 and 130 gCO₂ per Km better), thanks to the mix of current generation capacity.

But equally we see that on the basis of the same mix of generation capacity, emissions of NO_x and particulates for electric vehicles are generally worse than for their like-for-like equivalent petrol and diesel-powered vehicles (between 150 and 200 mg NO_x+PMs per Km worse), though not at the roadside, of course.

All of this, before factoring end-of-life and road usage wear and tear, which reduces the relative advantage in the case of CO₂ and increases the disadvantage further in the case of NO_x and particulates.

Note anyone claiming that CO₂ is a pollutant is simply not telling the truth. On planet earth Carbon and Carbon Dioxide (CO₂) are essential constituents of life, and without them NO life would exist. Atmospheric CO₂ and closed system “green house” warming effects are separate issues entirely.

The only solutions to these facts are to move to nuclear, hydro, wave, wind and/or solar electricity power generation and/or the development of dramatically more efficient fossil fuel electricity generation technology.

Until we see this major intractable obstacle overcome, the “green” electric car, for all it’s supposed allure and environmental credentials, remains a myth peddled by politically/emotionally motivated and commercially cynical lobbies and “rabbit caught in headlight” frightened politicians, throwing the woolly hats a nut cutlet.

This is no call for complacency or rampant, unbridled emissions of air pollutants. There remain many, many issues to tackle, including slack, lazy government and rich individual and corporate greed, plus every day ignorance and complacency.

Rather it is a call for reason, balance and fact based argument, before dubious hysterical, zealous and knee jerk judgement.

And above all a call for firm, continuing governmental support for the REAL sustained improvements that have been wrought, so far, in people’s lives in the last 100 years.

Rather than the modern penchant to ban or subsidise everything in a panicked sop to a minority of vitriolic dreamers, government, entirely paid for by the taxpayer (“there is no such thing as public money – there is only taxpayers’ money”), should honestly and forthrightly live up to the broad social contract; to keep the nation safe, prevent excess of greed and set and impose the legal limits to balance economy and environment for everyone’s benefit, **but with a light touch**.