Comments on I.Mech.E. response to the OLEV 2035 Consultation **Gordon Taylor** **2020-07-30**

2020-07 OLEV 2035 Consultation: Phasing out petrol, diesel and hybrid cars and vans by 2035 – Institution of Mechanical Engineers and Expert Partners' Response,
https://www.imeche.org/news/news-article/institution-and-expert-partners'-response-to-the-olev-2035-consultation

P 9. 'The modelling takes no account of demand drop or modal shift'. This means that the results are all on the high side.

P 11. 'The model assumes that the electric range of the plug-in hybrid vehicles climbs steadily to about 75km by 2030 and that significant proportion of their driven miles are electric (~65%),..'. 75 km would be about a quarter of the 300 km range of near-term BEVs. However, 'Correspondingly, the range for the battery electric vehicles increases to about 600km by 2030, improving to over 700km by 2050' seems very unlikely. This would increase vehicle weight and cost considerably, while with 300 km range, longer journeys would still be possible with fast charging – e.g. during necessary 'comfort breaks'.

P 20. 'There are potential risks associated with the availability of key resources (e.g. renewable energy and battery materials) and for increased battery production rates required to serve a complete transition to ZEVs by 2035.
There may be potential difficulties in deploying charging infrastructure solutions sufficient to meet the needs of all mainstream and niche consumers in this period'.
But there are also risks that the required volumes of low carbon fuels are not available.

P 20. 'There will need to be access to vehicle data to ensure the plug-in/range extended hybrids are used as intended to ensure the GHG savings are achieved'.
But this can be avoided by ensuring that sufficient low carbon vehicle fuels are available to meet the GHG emission targets.

P 24. Mention of hydrogen and fuel cell vehicles. See also P 30. This is a blind alley for transport.
Hydrogen fuel cell vehicles (FCEVs) have only a quarter of the WTW efficiency of BEVs.
(See: 2006-10 Does a Hydrogen Economy Make Sense?, Ulf Bossel, https://ieeexplore.ieee.org/document/4016414).
Low temperature (PEM) fuel cells, as needed for speedy warmup, require Platinum Group Metals for catalysis. These are very scarce and expensive.
The cost of a renewable hydrogen refuelling infrastructure would be huge.
Hyundai, which with Toyota, is the only maker of fuel cell cars, has just announced that it is switching to BEVs.
(See: 2020-07-28 Hydrogen champion Hyundai races to electric as Tesla takes off, https://uk.reuters.com/article/us-autos-hyundai-tesla-focus/hydrogen-champion-hyundai-races-to-electric-as-tesla-takes-off-idUKKCN24S2TE).

Not Mentioned.

The dual approach with PHEVs and renewable fuels would help to reduce GHG emissions while batteries remain in short supply. PHEVs require batteries of only about a quarter the size of BEVs, but they can account for much of the total mileage. But this still requires ample opportunities for charging, and that the running cost is much less than for liquid fuel.

The Government's primary concern should be meeting the zero by 2050 climate target, while ensuring the supply of Food and Shelter (including heating). The lockdown has shown that the necessary transport associated with these is small – e.g. 10% of normal. Most public transport (train, tram, bus) is already or easily electrified. Much other transport is optional, especially with increased working from home. So GHG reduction should be achieved by switching to electric modes, increased eFuels and reduced road transport volumes.

These should be complimented by progressive taxation of larger, heavier vehicles. This would help with the Net Revenue Loss. All transport – including public bus and rail and domestic aviation and marine - should pay fuel tax on a net carbon basis. This too would help with the Net Revenue Loss. These would reduce transport volumes, so investment in infrastructure such as roads, rail and runways should be reduced in favour of investments in the manufacture of batteries and eFuels.

The Well-to-Tank efficiency of eFuel is only about half that of charging BEVs, and the Tank-to-Wheel efficiency is only about a half at best or a quarter on average. So the electricity consumption for eFuel could be four to eight times that for charging BEVs. To reduce the need for Alt Fuels, PHEVs should be phased out after 2035.