

To: Climate and Environment Panel

Date: 09 March 2023

Report of: Head of Corporate Strategy

Title of Report: Fleet Decarbonisation

Summary and recommendations	
Purpose of report:	To update the Panel on the topic of fleet decarbonisation.
Key decision:	No
Cabinet Member:	Councillor Anna Railton, Cabinet Member for Zero Carbon Oxford and Climate Justice
Corporate Priority:	Pursue a zero carbon Oxford
Policy Framework:	Council Strategy 2020-24

Recommendation: That the Panel resolves to:

- Note the report and to consider any recommendations it wishes to make to Cabinet.**

Appendices

None

Next Steps for Fleet Decarbonisation

Background

1. ODS has been proactively replacing the diesel fleet with electric vehicles for the last decade, though with innovation grant the Council won for Energy Superhub Oxford in 2020 this allowed an acceleration in the replacement programme. Over the last two years ODS has continued to replace vehicles and will meet and potentially exceed a target of 25% of its fleet of c320 vehicles to be electric by the end of this year. Beyond that date there have been no official new targets set for decarbonising the fleet but Oxford City Council has a target of Net Zero Carbon by 2030, which would almost certainly require a net zero fleet. This paper outlines the rationale for not setting a new interim EV fleet target and options and challenges for decarbonising the rest of the fleet over the next 7 years.

Strategic approach to decarbonisation

2. In December 2021, [Oxford City Council clarified](#) its approach to Net Zero would focus on investment in long-term sustainable solutions, rather than short-term measures with long-term cost commitments and minimal co-benefits or cost-reductions to the Council (such as green gas purchase and offsetting). This approach was aligned to advice provided by Professor Nick Eyre. This included the prioritisation of expenditure according to the following hierarchy:
 - a. 'Additional' emissions reduction by the Council from its own activities
 - b. Insetting (i.e. support for emissions reduction by others in Oxford).
 - c. Offsetting actions outside the City, including the purchase of green gas credits
3. Fleet emissions account for 27% of the Council's emissions. The Council/ODS is on track to meet its current target to switch over 25% of the c.320 fleet vehicles to electric during 2023.

Fleet decarbonisation

4. Currently there are two main ways of fully decarbonising a fleet – by switching to EVs or hydrogen-powered vehicles. The other option, Hydro-treated Vegetable Oil (HVO) can be used to partially decarbonise a fleet. Nevertheless, there are significant risks associated with making a bet on any of these technologies today.

Hydrogen

5. Some in the automotive industry are backing hydrogen fuel cells as the optimal long term solution for zero carbon HGVs – as these would operate without batteries, which are heavy. However, hydrogen vehicle technology is still in early stages, and applied to a very limited vehicle pool. Currently it also has extremely high infrastructure costs. Therefore, while ODS is looking at opportunities to trial the use of a hydrogen vehicle, the technology does not offer current options for an ongoing vehicle replacement programme.

Electric Vehicles

6. EV vans and other LGVs are now commonplace and ODS has been using these to replace diesel equivalents that have reached the end of their useful lives. However, economically viable solutions are not readily available to electrify larger vehicles such as large vans, tippers, specialist municipal vehicles or HGVs (including refuse collection vehicles). ODS operates one EV dustcart, however this model is not considered suitable for multiple purchases.
7. EVs are no longer as economically attractive to operate as they previously were, even for the smaller vehicles. This is primarily due to the rising cost of electric resulting in a higher cost of charge per KW and the now reducing cost of diesel prices again. The result is a closing gap in fuel savings between diesel and electric. Also relevant is that ODS operates within a small boundary so its fleet

mileage is not high for many vehicles, whereas fuel savings become more relevant the higher the mileage. When considering this and the difference in initial costs of electric vs diesel vehicles of £5,000-20,000 then the reduced fuel savings from electric no longer offset this. The reduction in maintenance service costs is minimal per vehicle. Additionally, the government is removing subsidies for the purchase and operation of electric vehicles.

8. Lastly, ODS also faces challenges around EV charging capacity as it is nearing the limits of existing depot power capacities and installed additional charging units across Cowley Marsh, Horspath, Oxpens and other satellite locations; some additional EV charging units will be added to Cutteslowe Park. ODS is working with the Council Environmental Sustainability team to look at other options to boost charging capacity for the fleet, linked to wider work around an implementation plan for the Oxford Electric Vehicle Infrastructure Strategy.

HVO

9. The use of HVO has been considered as a 'drop-in' fuel to reduce the carbon emissions of remaining diesel fleet vehicles. HVO is a 'second generation' biofuel when made from used cooking oil (UCO) such as rapeseed, sunflower, soybean, and palm oil, as well as animal fats, following a chemical process involving hydrotreatment with hydrogen.¹
10. HVO can offer carbon savings compared to diesel of up to 90%. Dependent on the contract price, this would cost up to £150 - £200,000 per year on top of existing ODS' existing fuel costs.

Problems with HVO

11. The [Energy Saving Trust](#) has summarised the issues with HVO, which arise from its lifecycle biodiversity and climate change impacts. These include:

Carbon emissions

12. Indirect land use change often isn't accounted for (even for 'sustainably sourced' HVO) in the carbon calculations. A lot of the UCO is imported from SE Asia and Americas, where it is not a waste product because it would otherwise be used as an animal feed. The market for HVO is causing many farmers to replace UCO, which in turn is leading to the destruction of virgin forest to produce palm oil.
13. The hydrogen used to treat HVO can be derived from fossil fuel sources and still be considered 100% renewable under the Renewable Transport Fuels Obligation. EST has concerns about the sustainability protection provided by the scheme.

¹ <https://energysavingtrust.org.uk/wp-content/uploads/2022/07/Energy-Saving-Trust-HVO-policy-position-Final-.pdf>

14. The carbon emissions fluctuate year on year due to the source of HVO and the carbon factors used, sometimes by up to 14%. Means the future carbon saving claims may not be reliably counted on.

Cost

15. The HVO price is linked to the global food market. Recent shocks could mean the cost of HVO fuels likely to increase.

Air quality

16. There is mixed evidence on the impact on air quality, with no guarantee that reported reductions in NOx will be achieved. Much depends on the engine injection control and the fuel quality (HVO blend).

Advice from Council's Scientific Advisor, Professor Nick Eyre:

17. We sought input from the Council's Scientific Adviser. He highlighted the following concerns with HVO:

- a. *It's essentially a 'first generation - i.e. food-crop based - biofuel, which have relatively high carbon emissions in production*
- b. *The production process involves hydrogen, which is currently produced from fossil fuels*
- c. *There are serious doubts about the extent to which is genuinely a waste*
- d. *It's at best a niche market product – there is no realistic to it being a generalisable solution for heavy vehicles*
- e. *Any association with SE Asian palm oil has high risks of links to deforestation, and therefore potential reputational risks*

Next Steps

18. Currently, the Council has purchased fleet vehicles on behalf ODS, on which it levies a charge. ODS is in the process of carrying out a detailed market pricing exercise for leasing fleet vehicles, which might increase flexibility around continued transition to EVs. ODS is also seeking to mitigate the cost of the fleet through size reduction (vehicle sizes and overall fleet size), while managing operational risks in providing enough vehicles to meet future need and to compensate for downtime in light of supply chain lead times.

19. However it should be noted the vehicle production industry has been beset by continued problems (chip shortages, the continued knock on of factory closures during COVID, raw materials delays) which has extended lead times and increased prices in the leasing market as well as in purchasing vehicles.

20. ODS will continue to procure LGV EVs as appropriate to meet replacement needs and within the constraints of charging infrastructure it can utilise. Therefore, it is expected the overall proportion of EVs within the ODS/Council fleet will continue to expand.

21. The Pathways to a Zero Carbon Oxfordshire programme, being developed under the Future Oxfordshire Partnership and in which Oxford City Council is participating, will look at what hydrogen infrastructure may be needed to future proof HGV requirements. Where opportunities arise, ODS will also trial the use of hydrogen vehicles.

Conclusion

22. Given the limited availability of EVs to meet all ODS/Council fleet needs, the uncertainty over whether or not hydrogen or EV will become the optimum technology for HGVs and the current constraints on available EV charging infrastructure, officers and portfolio holders agree it would not make sense to set a new interim fleet EV target between now and 2030. That position may well change as technologies and markets develop and as Oxford's EV infrastructure network expands.

23. At the same time it is expected that the proportion of EVs in the fleet will nevertheless continue to increase and it is not proposed to change the longer term target of a net zero fleet by 2030.

24. HVO has been considered as a 'stepping stone' fuel to reduce fleet emissions however the Council Officers and Portfolio Holders have accepted the sustainability concerns raised by the Council's Scientific Adviser and have rejected this as a potential strategy for the time being.

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