

Appendix B - Purchase of Low Emission Caged Vehicles - Alternative Fuel Research

1.0 Hydrotreated Vegetable Oil (HVO)

Hydrotreated Vegetable Oil (HVO) is a bio-based fuel which is a low carbon alternative to standard white diesel. It is slightly more expensive than diesel and is slightly less readily available due to the relative infancy of the supply chain, however price point and the position on availability are both improving at a steady rate. It is not a fossil fuel but is considered to be a transitional fuel which means that while it can play a significant role in plugging the gap to net zero, it does not eliminate all emissions. HVO can be used in almost all conventional diesel engines and the majority of commercial vehicle manufacturers confirm that their vehicles are compatible and that HVO has no warranty or service life implications.

The use of HVO will be further explored as an option to reduce the council's emissions but does not currently feature in the recommendation to replace the six current 7.5 tonne tipper vehicles with new diesel engined equivalents.

Further research into HVO use has shown that this type of fuel could lead to an 80-90% reduction in emissions, this being solely through the cleaner way in which the fuel is produced. This is to say that the fuel itself still produces carbon through the combustion engine, but reaches us with a cleaner history, and the volume of carbon emissions is still much less when compared to diesel. (HVO produces 0.195 tonnes of co2 per 1,000 litres burned, compared to diesel which produces 3.17 tonnes per 1,000 litres) HVO also reduces nitrogen oxide, particulate matter and carbon monoxide, therefore reducing exhaust emissions and improving local air quality.

Recent research by the Cleansing Services Team suggests that the fuel can be used by almost all of our vehicles and can even be blended with standard diesel meaning that vehicles do not need to be purged of diesel fuel prior to filling tanks with HVO. It is claimed that there is little to no impact in performance between the two derivatives.

The market for HVO fuel has also changed quite dramatically in the last few months. With the product now readily available through our current fuel supplier, and importantly the market price has fallen to the extent that during September 2024, the cost difference ranged between +4p and +12p per litre.

Table 1	2023/24	2024/25
Fuel Cost Comparison	(01/04/23 - 31/03/24)	(01/04/24 - 30/09/24)
	(£)	(£)
Actual Cost ¹	506,148.82	287,217.42
Equivalent HVO Cost ²	686,107.01	331,536.83
Difference	179,958.19	44,319.41
Percentage increase	35.60%	15.40%

¹ Cost of all diesel fuel delivered to the fuel storage tanks at Manston Road Depot

² Equivalent cost if the fuel purchased had been HVO instead of diesel

The table above shows the increased cost of fuel had the council switched to HVO last year and similarly what that increase would have been for this year to date. The cost of the HVO expressed in the table is based on the unit rate per litre at the time that the fuel purchase would have taken place. The fuel use throughout the year is not linear and assuming the usage this year is similar to 2023/24 and that fuel unit rates also remain the same for the rest of this financial year, then the estimated cost increase of using HVO rather than diesel is projected to be **£77,946.92** for the 2024/25 financial year. It should be noted that the fuel costs above relate to all of the council's vehicles that use diesel fuel, although the majority (approximately 75%) of this will have been used by Cleansing Services

A 3 month trial will commence next month using selected Cleansing Services vehicles. The conclusions of that trial will inform next steps in terms of whether HVO fuel is adopted for use by some or all of the existing fleet in the future and how the revenue impact of that decision would be addressed.

2.0 Hydrogen Power

Manufacturers are developing hydrogen fuel celled heavy goods vehicles but these are not at a point where they are commercially available on the market. Some combustion engines are capable (with modification) of using hydrogen but the modification to the vehicle is expensive and the supply chain and infrastructure required for the delivery and storage of hydrogen fuel is currently insufficiently developed to meet the needs of the commercial vehicle market. The use of hydrogen fuelled vehicles has therefore been discounted at the current time.

3.0 Conclusion

Recent investigations in alignment with the council's Net Zero Strategy and Carbon Reduction Plan have indicated that the use of HVO as an alternative fuel is potentially viable and a formal trial will take place from November 2024 using a selection of existing cleansing services vehicles.

Further investigation has also shown that, despite the increased capital cost and the need for investment in charging infrastructure, there is an opportunity to replace two of the required new 7.5 tonne cage vehicles with electric powered versions and thereby avoid purchasing combustion engined vehicles in those instances.

There is some risk to the adoption of EVs as replacements for two of the six required 7.5 tonne caged vehicles. There is the possibility that there could be an impact on service delivery if the vehicles cannot operate for a similar length of time to the diesel equivalent throughout the anticipated service life of the vehicle.

However, the longer term direction of travel must be aligned with the aims of the Net Zero Strategy and based on current technology it is likely that in the future the entire fleet will be electrically powered. It therefore makes sense to gain as much early experience as possible of operating with electric vehicles and the purchase of two 7.5 tonne electric HGV's provides the ideal opportunity to do that.

Subject to the forthcoming trial the use of HVO has the potential to substantially reduce the emissions of the entire vehicle fleet. However it must be remembered that HVO is considered to be a transitional fuel and not a solution in the long term. It is not therefore a permanent alternative to electric or any other zero emission vehicles. It can however help to reduce emissions in the short term whilst the council prepares for a wider scale change to zero emission vehicles.