Committee:	Scrutiny Committee	**Date:** 3 May 2025
Title:	Switch to HVO fuel in fleet vehicles	
Portfolio Holder:	Councillor Neil Reeve	
Report Authors:	Rebecca Griffiths, Climate Change Officer Ben Brown, Director of Climate and Environment	**Key decision:** Yes

Summary

1. Cabinet is due to consider the following report on 19 June 2025 and in advance of that meeting the views of the Scrutiny committee are sought.

2. In April 2024 Cabinet approved the updated Climate Change Action Plan which included an action to put into place a plan to decarbonise the fleet to low or zero carbon emissions by 2030. As part of meeting that action officers commissioned APSE (Association for Public Sector Excellence) Energy to produce a carbon baseline and trajectory report of how the council could meet its Net Zero by 2030 commitment.

3. As part of the APSE report a timeline and cost projection of transitioning UDC's fleet to meet the Net Zero by 2030 target was created. The anticipated cost of transitioning the fleet to meet the 2030 target, by replacing all vehicles with EV's was calculated to be over £11.5 million in the next 5 years. This did not account for additional projected population growth, or the rurality of Uttlesford District. Therefore, the length of collection rounds means the lorries used for refuse collection are unusually large, and currently there is no like for like EV replacement. Therefore, real world capital and revenue costs are likely to be even higher.

4. A viable alternative to full fleet EV conversion is switching to Hydrogenated Vegetable Oil (HVO) fuel. HVO fuel offers a 90% reduction in CO_2 emissions compared to Diesel and is a direct 'drop in' replacement for Diesel. There are no associated capital costs with switching to HVO fuel and studies have shown no impact upon engine efficiency or maintenance costs. Meaning that a switch to HVO is an easily reversible decision.

5. HVO will be more expensive to purchase than Diesel, currently trading at a 40p uplift per litre. However, this is considerably less expensive than the cost of total fleet electrification, as laid out in paragraph 2.

6. By transitioning to HVO, the council is able to dramatically reduce their carbon footprint, and deliver on their Net Zero by 2030 commitment, whilst buying time before any fleet electrification may be necessary. Enabling technological advances within the industry and potential reduced costs of EVs in the future.

7. Based on fuel consumption of our vehicles for FY 24/25, using HVO over the same period would represent a cost increase of circa £146,770.65 p/a.

8. Over the same period, switching to HVO would represent a reduction of 1,113.941 Tonnes of CO_2 p/a. Using the APSE report baseline, this could represent a possible 34% reduction in total council emissions. This is the single largest impact the council can make to reduce its total emissions. It would cut emissions overnight by the largest percentage of any single action.

Recommendations to the Scrutiny Committee

9. To consider the possible switch to HVO fuel in fleet vehicles and provide feedback to the Cabinet which may help in reaching a decision. *The recommendations in the cabinet report are shown below for ease of reference.*

Recommendations (for cabinet)

10. To approve the switch to HVO fuel in fleet vehicles

11. To note the potential additional annual cost of moving to an HVO fuel as set out in paragraph 6.

12. To instruct officers to build the potential additional costs into fleet budgets

Financial Implications

13. The potential additional annual cost will have to be accounted for in budget allocations going forward for FY26/27

Background Papers

14. The following papers were referred to by the author in the preparation of this report and are available for inspection from the author of the report:

    The Council Climate Action Strategy and Climate Action Plan.

    Annual Greenhouse Gas Emissions Report 23-24

    Trajectory report – APSE

Impact

15.

Communication/Consultation	The objectives of switching to HVO, including the wider concept of fleet de-carbonisation, and our intention to commission APSE energy to carbon baseline UDC's position and produce a trajectory report were reported to Scrutiny, Cabinet and full Council in the Climate Change Action Plan update report in April 2024. In addition to this, the business case for HVO was presented at the Climate Change Board on 27th January 2025 where support was given to progress to full cabinet paper. The proposed switch to HVO is reversible and requires no capital works. Therefore if negative feedback is received post switch it is always possible to switch back to Diesel at no additional cost.
Community Safety	The use of HVO instead of Diesel represents a decrease in risk to communities due to the increase in air quality from the reduction in CO_2 and Nitrogen Oxides. This represents health and wellbeing benefits across the district and on all routes used by refuse vehicles, especially when idling in traffic in more built up areas such as Saffron Walden or Great Dunmow.
Equalities	n/a
Health and Safety	There are no additional safety concerns related to using HVO compared to Diesel due to same density, flash point and viscosity. However, the level of risk depot workers are exposed to will be lower as HVO is 100% FAME (Fatty Acid Methyl Esters) free which avoids stability issues that biodiesel, gas oil and diesel products face. In addition to this, due to the high cetane number of HVO (greater than 70) and low cloud point (-32 degrees Celsius) HVO has improved cold-start properties compared to Diesel which reduces the risk of gelling during cold temperatures. Workers and vehicle operatives will also be exposed to reduced CO_2, Nitrous Oxides

	and PM (Particulate Matter) emissions as a result of switching to HVO which will improve working conditions as a result of improved air quality and reduce their exposure to toxic and harmful pollutants.
Human Rights/Legal Implications	All relevant procurement regulations and guidance will be followed. Advice has been sought from procurement in advance as well as support from APSE and the LGA.
Sustainability	If the switch to HVO from Diesel does get approved, it will contribute to the UDC commitment for carbon reduction to reach net zero emissions by 2030. Switching to HVO will result in an estimated reduction of around 1,100 Tonnes of CO2 p.a., based upon fuel usage FY 24/25. The sustainability of the supply of HVO has been considered and it is recommended that any supplier of HVO is part of the ZEMO fuels Renewable Fuel Supplier Accreditation Scheme (RFAS) which ensures supply is a result of waste product, and not virgin source. Members of the scheme undergo continuous compliance monitoring and annual audit. All supply chain must be traceable from feedstock origin. Requiring this accreditation helps mitigate against concerns around deforestation for plantation of seed oils and the sustainability of feedstock sources. Officers have spoken with procurement colleagues, and being part of the ZEMO RFAS scheme can be implemented as a requirement when procuring from the existing fuel suppliers framework.
Ward-specific impacts	The council have a responsibility to lead and influence action on climate change across the district. Switching to HVO will demonstrate to the district that the Council are taking action to reduce their own carbon emissions and providing a healthier and safer environment

	for their employees and for residents. It will also provide a high-profile case study and learning resource to inspire other councils or waste collection authorities to do the same.
Workforce/Workplace	Staff and tenants working in the Canfield Depot will be positively impacted as a result of the switch to HVO. The fuel switch will be pro-actively managed through a supporting engagement and communications plan for workers to understand why the switch is taking place and the positive impact upon their work environment and health. As listed above in the health and safety section, there will be numerous health benefits and improved working conditions through reduced exposure to toxic CO_2 and PM emissions through switching to HVO.

Situation

16. As a corporate and strategic priority, the Council have committed to take action on climate change by reducing carbon emissions of their council operations, prioritising renewable energy sources and managing our services in a sustainable way.

17. APSE Energy Associates were commissioned to prepare a Carbon Baselining and Trajectory report, which was agreed by Cabinet in April 2024 as part of the 2024/2025 Climate Change Action Plan. In order to create the report a large data gathering exercise was undertaken to understand, as best as possible, the Scope 1,2 and 3 emissions of the council. Switching to HVO is a Scope 1 emission decision (those emissions directly controlled by the organisation, such as fuel use). The consultants carried out; an audit of annual energy, fuel, and water consumption as well as understanding staff mileage and travel, contractor travel, and resource use relating to leased assets.

18. Part of the work involved in creating the trajectory was working out what investment would be needed to bring the councils emissions to Net Zero (or as close as possible) by 2030. The total estimated cost of this was given as over £21.7million. Over half of this cost relates to bringing the fleet to Zero emissions, as they are currently the councils largest source of operational emissions. As seen in the Annual Greenhouse Gas Emissions report. In order to bring the carbon footprint of our fleet (including refuse vehicles) to Net Zero emissions by 2030, the investment required was projected to be more than £11.5million.

19. The above projected cost does not account for any additional population growth as projected in the Local Plan, or account for the unusually large size of our refuse vehicles. The councils' vehicles are extraordinarily large compared to the average refuse collection vehicle due to the rural nature of the district, and the need to collect large amounts of refuse over a large area. Currently there are no refuse collection vehicles of that size and tonnage available as EVs. Therefore, projected investment to electrify the fleet has been based on the next best alternative. This means that required investment is likely to be larger than £11.5million.

20. A viable alternative to complete fleet electrification, whilst still making progress towards the councils' commitment to Next Zero by 2030 is to switch to HVO fuel in all fleet vehicles that currently use Diesel. It is viewed as a bridging fuel on the way to full fleet electrification that may not yet be financially viable.

21. HVO is Hydro-treated vegetable oil (not biodiesel) created by either hydrogenation or hydrocracking of vegetable oil. It can be made from a wide range of materials including residual animal fat from food industries, tall oil by-products, used cooking oil and more. HVO is a direct drop-in replacement for Diesel in vehicles meaning that there is no capital cost associated with the switch. Existing Diesel tanks on vehicles are simply emptied and re-filled with HVO. Evidence in studies shows that there is no impact on engine performance, efficiency or maintenance costs.

22. Using HVO represents a 90% reduction in CO_2 emissions compared to Diesel and a 27% reduction in Nitrogen Oxides resulting in not only huge progress towards Net Zero Carbon emissions, but also associated air quality and health benefits within the district.

23. Many other Local Authorities across the country have taken this step. For Brentwood Council it delivered a 42% cut in their total council emissions – their single largest move to Net Zero. For Chelmsford they saw no change in milage efficiency or maintenance costs. Rochford council have also made this change.

24. Another benefit is that as HVO is a direct drop-in replacement for Diesel, If after a period it was decided for some reason to return to using Diesel, this would be easily possible with no additional cost of changing back.

25. HVO is more expensive than Diesel. Our procurement team have advised the council which framework procurement of HVO would be run through, and the associated costs. The Framework releases weekly pricing and shows that the HVO baseline price is pegged to the Diesel baseline price (determined by global markets) but has different added costs. There will be an associated CCS margin (for using the framework) and the supplier margin (where the price of HVO and Diesel differs). If the council goes out to tender, it will be this cost that the suppliers bid on.

26. Based on soft market testing and advice from Chelmsford Council, there is currently a 30 - 40p per litre uplift compared to Diesel. Below follows a cost

comparison analysis for the FY 24/25. Fuel prices for HVO are based on data shared by Chelmsford council who purchased HVO over the same period.

a. The council used 435,274 litres of bunkered Diesel fuel, costing a total of £493,406.37
b. The council used 14,401.66 litres of forecourt Diesel fuel, costing a total of £20,846.20
c. Total cost for this period using Diesel was £514,252.57
d. The cost of using the same amount of litres of HVO over the same period would have been £661,023.22[1]
e. This represents a modelled cost increase of **£146,770.65** for the FY24/25 for using HVO compared to Diesel.

27. It must be noted that like Diesel, the price of HVO is volatile and fluctuates in relation to market supply and demand. Depending on the state of the market at the time the council decides to go to tender, additional costs could be more or less than the estimated analysis above. The council would manage these cost pressures and fluctuations in the same way they currently do for Diesel.

28. When considering the impact of using HVO on Carbon emission reduction, using the same FY24/25 baseline, the councils' emissions using Diesel were 1,129.94 Tonnes CO_2.[2] If during this same period the council had been using HVO, total emissions from fuel would have been 15.99 Tonnes of CO_2. Representing a possible reduction of 1,113.941 Tonnes of CO_2 p/a.

29. Given that the latest Carbon Baselining report from APSE Energy put total council emissions (Scope 1, 2, and 3 where data was available) for FY 23/24 at 3,269 tonnes CO_2 then a switch to HVO could represent a possible 34% decrease in total emissions. This is the single largest action the council can take to reduce their emissions. Currently no other action is able to deliver this scale of reduction in carbon footprint.

30. Council officers have consulted in depth with APSE energy, the LGA and peers and the consensus is that switching to HVO should not be viewed as a long term solution, but rather a step on the way towards full fleet de-carbonisation.

31. HVO generates wider health benefits as, compared to Diesel, HVO tailpipe emissions emit less CO_2, Nitrous Oxides and PM (Particulate Matter) emissions[3].

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[1] Average purchased price for HVO over the same period was 1.47pence per Litre Source: Chelmsford City Council Operational Services Manager and Chelmsford Procurement Team

[2] 1 Litre of Diesel Emits 2.51279 Kg of net CO2 and 1 Litre of HVO emits 0.03558 kg of net CO2 Source: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024

[3] McCaffery, C. *et al.* (2022) 'Effects of hydrogenated vegetable oil (HVO) and HVO/biodiesel blends on the physicochemical and toxicological properties of emissions from an off-road heavy-duty diesel engine,' *Fuel*, 323, p. 124283. https://doi.org/10.1016/j.fuel.2022.124283.

32. We have been advised that concerns around sustainability and traceability of imports, links to deforestation and provenance of raw materials feedstock are addressed through certification schemes that can validate claims about provenance of raw materials. The preferred and recommended scheme is Zemo's Renewable Fuels Assurance Scheme (RFAS).

33. Membership of the RFAS scheme involves annual audits and continuous compliance monitoring in order to ensure protection of land and biodiversity, and use of waste as a resource. The fuel supply chain must be traceable from feedstock origin to customer depot.

34. Council officers have spoken with UDC procurement team who have advised that they will be able to include membership of ZEMO's RFAS as a qualifying requirement as part of the procurement from the existing fuel framework.

35. The options available to the council are
    - **a.** Invest over £11.5million in the next 5 years in fleet electrification
    - **b.** Do nothing towards its Net Zero by 2030 commitment
    - **c.** Switch fuel to HVO to provide an immediate reduction in CO_2 emissions and progress towards Net Zero Fleet

    We recommend option C - Approval of the switch from Diesel to HVO fuel for use in all council vehicles.

36. This project will show case the Council taking action on climate change, in the same way that they have been committed to de-carbonisation through the Social Housing Decarbonisation scheme. It will also represent the single largest reduction in total council emissions in one go.

37. The below table sets out the high-level timeline and key milestones for project delivery of the switch to HVO if approved.

Timeline & Milestones	**Key Dates**
Business case approval at CCBB – complete	27th January 2025
Cabinet approval of switch to HVO and note additional cost	8th May 2025
Give notice on existing fossil fuel contract (90 -day required)	12th May 2025 – finishing on 11th August 2025
Procure new fuel contract for HVO (Register on CCS Framework as advised by procurement. Next quarterly competition on 6th June)	Register by 6th June 2025

Pinto, G.M. *et al.* (2025) 'Hydrogen and CNG dual-fuel operation of a 6-Cylinder CI engine fueled by HVO and diesel: Emissions, efficiency, and combustion analyses,' *International Journal of Hydrogen Energy*, 111, pp. 407–432. https://doi.org/10.1016/j.ijhydene.2025.02.306

Contract confirmation from winning business in framework competition	17th July 2025 Confirmation date
Last order of Diesel Bunkered fuel – commence draining usage	Circa 17th July 2025
Clean out of bunkered fuel container	Once container empty – circa 10th August
Give Briefing to waste services staff about fuel change	Early August 2025
Take first delivery of HVO and commence usage	12th August 2025 onwards
Press story / comms around switch	Autumn 2025

Risk Analysis

38.

Risk	Likelihood	Impact	Mitigating actions
Risk that when Council formally go out to procurement for HVO suppliers, the market costs of HVO has increased above the previous calculated uplift costs, resulting in additional cost burden on Council, on top of that already set out in this report.	2	3	The volatility of price in HVO is no greater than the council is currently subject to with Diesel, although as noted above, the price per litre is higher. The Council will procure suppliers through the approved existing fuel framework agreements to limit price increases as far as possible. There is always the possibility to switch back to using Diesel if the prices increases in HVO are deemed unaffordable to the council.
Risk that vehicle mileage and therefore fuel use	2	2	Briefings will be given to all staff members that operate refuse collection vehicles from Canfield

may increase due to inability to fill up at forecourt pumps in emergencies. HVO will only be available as bunkered fuel.			Depot to ensure they understand they must ensure they have full tanks of HVO when they set off for their rounds. Careful planning will be needed to ensure fill up at Depot. There is always the option in a dire emergency to put a small amount of Diesel in a vehicle at a forecourt to get it back t the Depot. Approval will need to be given to do this.
Risk of large number of other councils/ businesses making the same decision to switch to HVO, leading to supply issues within the market. This could artificially inflate prices or restrict availability of HVO fuel	2	2	As with Diesel, there is always a risk that world events could restrict supply and artificially inflate prices. There is a risk that short term demand may outstrip supply. However, following on from the economic analysis that APSE energy conducted, a possible inflationary price of HVO is still likely to be a lot less than the over £11m required to fully electrify the fleet. It is also a distinct possibility that as the use of HVO becomes more mainstream the price and availability of HVO may fall, making the additional cost in comparison to Diesel negligible. To mitigate against this, being an early adopter or early mover should help UDC secure a reliable supply chain and secure supply of HVO at least on a quarterly basis. As part of our research, officers have spoken with other councils to learn from their experience. They have cited no problems with supply and price volatility is mitigated through framework procurement where a fixed pence per litre uplift compared to Diesel prices is established. Therefore, we plan to procure

			from the same framework, and will be exposed to no additional price fluctuations than we already are with Diesel. As mentioned previously, if supply of HVO becomes problematic there is always the option to switch back to Diesel at no additional cost.
Insufficient capacity within UDC Fleet Dept to oversee delivery of the switch, resulting in delay and non delivery of the project.	1	3	Officers have produced a robust project plan and timetable and have already begun discussion with procurement to minimise staff resource required to deliver the project. Therefore, this likelihood of this amount of work being too much for staff to deliver is very low. In addition to this, once the switch is undertaken, HVO will be ordered like Diesel as usual by waste staff which represents no additional work or ongoing tasks once the switch is undertaken. A further mitigation has been undertaken by making climate change team officers available to support on delivery and switch of HVO.
Risk that the feedstock origin of HVO fuel is related to deforestation and un-sustainable agriculture practises.	2	1	The risk of un-sustainable feedstock supply of HVO can be addressed through certification schemes that can validate claims about provenance of raw materials. Officers have sought support from APSE, the LGA and peers currently using HVO. The preferred and recommended scheme is Zemo's Renewable Fuels Assurance Scheme (RFAS). Membership of the RFAS scheme involves annual audits and continuous compliance monitoring in order to ensure protection of land and

			biodiversity, and use of waste as a resource. The fuel supply chain must be traceable from feedstock origin to customer depot. Council officers have spoken with UDC procurement team who have advised that they will be able include membership of ZEMO's RFAS as a qualifying requirement as part of the procurement from the existing fuel framework. Therefore, we believe the above mitigation will be sufficient to ensure sustainability of supply the best we can.

1 = Little or no risk or impact
2 = Some risk or impact – action may be necessary.
3 = Significant risk or impact – action required
4 = Near certainty of risk occurring, catastrophic effect or failure of project