

# DECARBONISING ENGLISH COUNCIL HGV FLEETS

## PERCEPTIONS, PLANS & BARRIERS



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Decarbonising English Council HGV Fleets  
Perceptions, Plans & Barriers

ESDO works towards a healthier, safer and more equal planet.

European Sustainable Development Organisation (ESDO)

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## Acronyms

BEV	Battery Electric Vehicle
CNG	Compressed Natural Gas
COP	Conference of the Parties
ESDO	European Sustainable Development Organisation
FDM	Fleet Decision Maker
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
HFCEV	Hydrogen Fuel Cell Electric Vehicle
HGV	Heavy Goods Vehicle (for our purposes, over 3.5 tonnes: lorries, refuse trucks, buses)
HVO	Hydrotreated Vegetable Oil
ICE	Internal Combustion Engine
LGV	Light Goods Vehicle (for our purposes: vans up to 3.5 tonnes)
LNG	Liquefied Natural Gas
MtCO <sub>2</sub> e	Million tonnes of Carbon Dioxide equivalent
NDC	Nationally Determined Contribution (to emissions reduction)
QI	Qualitative (semi-structured) Interview
RCV	Refuse Collection Vehicle
SUV	Sports Utility Vehicle
ULEV	Ultra Low Emission Vehicles
ZEV	Zero Emission Vehicle (at the tailpipe)





## Executive Summary

The purpose of this research was to understand how prepared English councils are for heavy goods vehicle (HGV) decarbonisation. This includes whether councils understood their current options for decarbonising HGVs; how progressed their planning was; what the barriers to transition were; and the general orientation and understanding of the issue amongst English councils.

Councils operate a unique fleet that few other organisations use. In the Light Goods Vehicle (LGV) segment, it includes vans, minibuses, SUVs, pickups, light trucks and mobile libraries. In the HGV segment, it includes road sweepers, road gritters, refuse collection vehicles (RCVs), buses, snow ploughs, fire engines, flatbed lorries and rigid or articulated multi-axle lorries.

Council fleet decision makers (FDMs) report facing complex and difficult decisions when forming strategies and implementing plans for the transition of their fleets to low emission vehicles. The three biggest issues recorded during the qualitative interviews conducted by ESDO were a **lack** of:

1. **information** on low-emissions vehicles;
2. **funding** for the procurement of vehicles; and
3. development of **alternative refuelling infrastructure**.

Despite the fact that there are already solutions in the market today which can significantly reduce commercial vehicle emissions such as Bio-CNG and HVO, the study found that many councils are focused on Battery Electric Vehicles (BEVs) and have not properly explored other options.

Many did not know about Bio-CNG or HVO and the reductions in overall emissions these fuels can deliver compared to diesel Internal Combustion Engine (ICE) vehicles.

Councils that had already transitioned to Bio-CNG or HVO reported no reduction in operational effectiveness. Respondents that did understand Bio-CNG were still supportive of it as a solution to reduce their council's HGV

emissions. However, the absence of refuelling infrastructure was noted to be the key barrier to adopting this technology.

Councils will struggle to invest in both new vehicles and the infrastructure to refuel them at the same time. Without sufficient, accessible, suitably positioned low emission refuelling infrastructure, they will be less able to achieve their emissions reduction targets.

The study found that:

1. Councils should consider existing solutions available to reduce emissions in the immediate term (i.e., Bio-CNG and HVO);
2. The UK Government should provide early incentives and/or subsidies for councils to transition their LGVs and HGVs to lower-emission fleets, early enough to influence vehicle replacement cycles;
3. Councils should consider combining resources to solve the refuelling infrastructure issue or consider public-private partnerships to do so, that remove much of the capital expense of the refuelling infrastructure to councils; and
4. Councils would benefit from improved information sharing on their LGV and HGV transition.

The choice of alternative fuel is likely to be informed by the availability of refuelling infrastructure that meets council operational and logistical requirements. This is because fuels being considered by councils are closely allied with perceived availability of infrastructure – councils are basing their decarbonisation strategy on current local infrastructure provision.

As the study found a large gap between which alternative fuels were already available, and the perceptions reported by councils, a clear opportunity for education was identified.

Overall, the results suggest that investment in refuelling infrastructure will accelerate adoption of lower emission HGVs by English councils.





## Introduction

Transport is consistently one of the largest contributors to total UK greenhouse gas (GHG) emissions since 2016. Statistics from 2020 (published in June 2022) estimate that transport accounted for 24% of all UK emissions (406 MtCO<sub>2</sub>e). The majority (91%) of emissions from domestic transport came from road vehicles (89 MtCO<sub>2</sub>e).

The biggest contributors to this were cars and taxis, which made up 52% of the emissions from domestic transport (51 MtCO<sub>2</sub>e); HGVs (19% of domestic transport emissions, 18.6 MtCO<sub>2</sub>e) and vans (16% of emissions, 16 MtCO<sub>2</sub>e). (UK Government 2022b).

Decarbonisation of transport is therefore a high priority if the UK is to reach the commitments it has set in its Nationally Determined Contributions (NDCs) as part of the Paris Agreement.

As part of the UK's NDCs, in 2021 the UK government announced, "a commitment to end the sale of new petrol and diesel vehicles by 2030, and that all new cars and vans will be required to be fully zero emission at the tailpipe by 2035" (UK Government 2021a), with "all new HGVs sold in the UK to be zero emission by 2040." (UK Government 2021b).

This is a big task. There are currently 615,570 HGVs and 31,000 buses, with 9,000 buses operating in the UK. (UK Government 2023d)

## Options for HGV Transition

Currently, the options available for HGV decarbonisation include:

- Biomethane compressed natural gas ('Bio-CNG');
- Hydrotreated Vegetable Oil ('HVO');
- Battery electric vehicles ('BEV');
- Hydrogen fuel cell electric vehicles ('HFCEV'); and
- Hydrogen, when viable.

Bio-CNG is purified biogas, a mixture of primarily methane and CO<sub>2</sub>, generated by anaerobic digestion of naturally occurring by-products (including sewage, manure, and other organic waste that would anyway be emitting into the atmosphere). Because of this recycling aspect to its production, Bio-CNG offers a very attractive source of renewable energy, and one of the few immediately viable solutions for emission reductions for HGV fleets.

HVO, also known as 'renewable diesel', is a paraffin-based biofuel produced through purification of organic vegetable or animal fats.

HFCEVs are electric vehicles that use hydrogen fuel cells, sometimes in combination with a small battery, to power an electric motor.

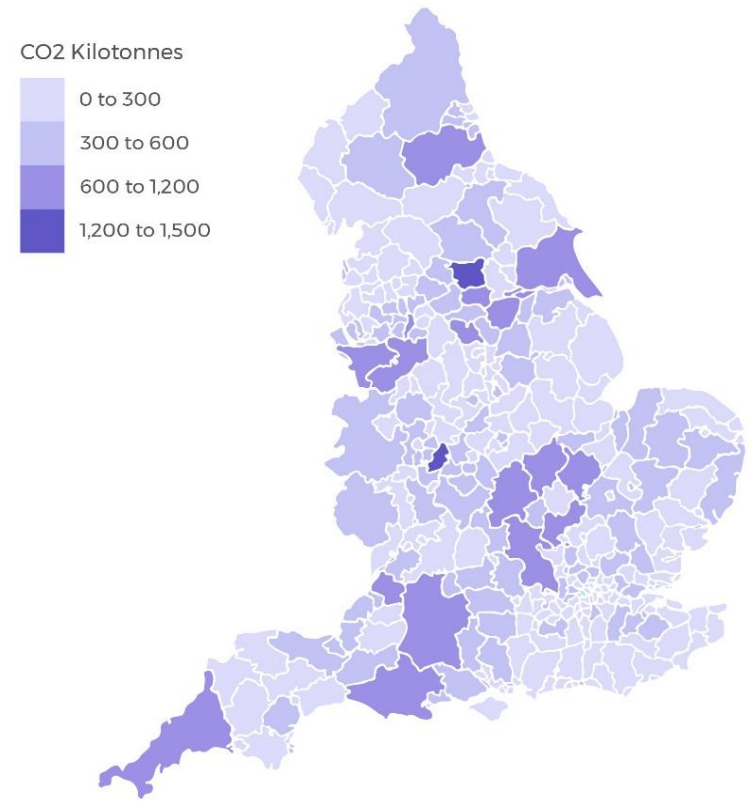




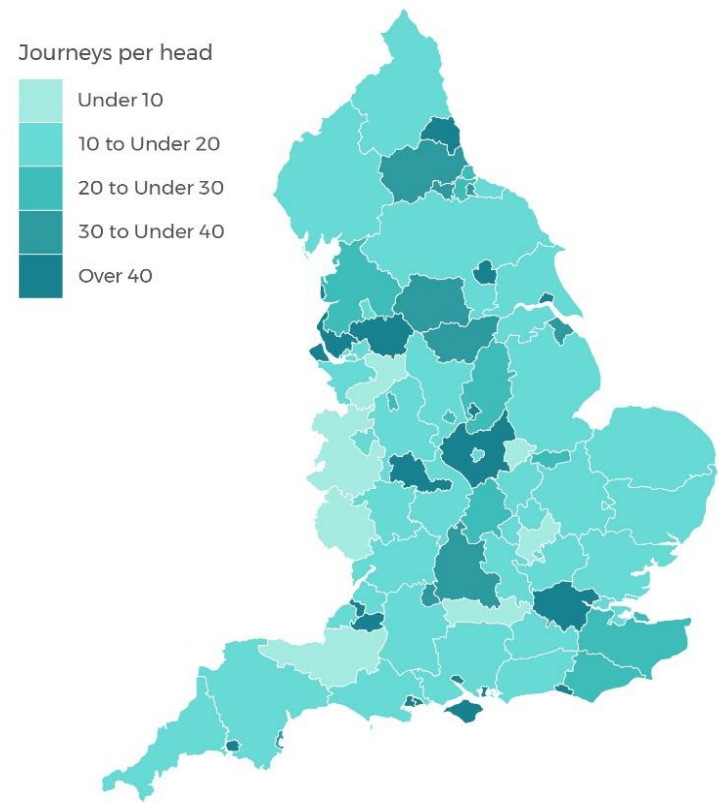
### Inset

Annual emissions from transport in each local authority in 2020 averaged 281 kilotons (UK Government 2022b), although the distribution is highly variable (see Map 1). An indication of fleets' contribution to emissions, specifically from bus fleets, may be inferred from national statistics for regional bus use (see Map 2).

Map 1: CO2 emissions from transport within local authority areas, 2020 (UK Government 2022b)



Map 2: Bus journeys per head of population within local authority: England, financial year ending 2022 (UK Government 2023d)





## Research Methodology

### Objectives

This research sought to understand how English councils are responding to UK Government emission reduction commitments for HGVs. This included understanding the options councils perceive to be available to them and whether the provision of refuelling infrastructure would accelerate these plans. The research focused exclusively on HGVs and buses, with a focus on CNG, BEV and HFCEV solutions as existing options.

This study also aimed to understand the decision-making process for councils to transition HGV fleets to lower emission technologies. This involved understanding council strategies, influences, pressures and knowledge levels on alternative fuels for HGVs and other heavy council vehicles (i.e., refuse trucks, buses, etc.).

This study also sought to understand the educational needs of decision makers in councils. This included understanding where the motivations and pressures for decarbonisation originate from (e.g., councillors, constituents, civil society, consumers, national politicians); what the interactive incentives are (prescription, obligation, inspiration, ethics); and how these motivations influence feelings about the transition deadlines.

### Methods

The study was a primary, qualitative-led study with councils in England only. The study included a literature review of existing reports and policy documents along with qualitative semi-structured interviews (QIs) of council fleet decision makers. QIs were mostly conducted by phone with a small number of video calls. In some cases, emails were used for follow-up questions and clarifications.

The definition of a fleet decision maker (FDM) was someone who is partly or fully responsible for making purchasing decisions on HGV vehicles for an English council. In practice,

this was rarely one person in a council. Decisions on fleet purchases were made by a small purchasing committee, with a sponsor and input and strategic guidance from councillors. This means that both elected councillors and employees of councils were interviewed.

The QIs comprised an introduction of research purpose, disclaimer and permissions (GDPR clearance, assurance of anonymity) followed by the research questions (see *Appendix 1*).

### Sampling

There are 317 councils in England including 21 County Councils, 164 District councils, 62 Unitary authorities, 36 Metropolitan districts, 32 London Boroughs, plus 2 Sui Generis Unitary authorities, (the City of London and the Isles of Scilly), (UK Government 2023b). Multiple people in 217 councils were contacted.

The target sample size was between 40 and 60 QIs across all English councils except the City of London and the Isles of Scilly. It included County Councils, District Councils and Unitary Authorities.

The sampling was a theoretical non-random sample with qualitative findings that are not generalisable across any population. Non-response rates were high and this also ensures the results are not generalisable. However, while the study is not generalisable across a population, it is useful in explaining (rather than quantifying) the challenges for council fleet decarbonisation.

After trying several approaches, the best method for contacting fleet decision makers was to call councillors and ask for a referral to a FDM. This was because most councils provide the contact details of councillors. Councillors who had some responsibility and influence on HGV purchasing







decisions were then interviewed (n=42) and, mostly through councillor referrals, n=35 fleet decision makers were also interviewed. These represented 77 different councils.

No specific quotas were imposed on political party representation in the methodology. However, recognising the potential for different political ideologies to influence the findings of the report, representation across parties was collected on interviewees from council websites. Of the Councillors interviewed, 6% (3) were from the Green Party, 35% (15) from the Conservative Party, 40% (17) from the Labour Party and 16% (7) from the Liberal Democrat Party.

## Data Handling and Analysis

Substantive responses to questions on phone calls were transcribed verbatim (i.e., answers to research questions were transcribed but unrelated comments and conversations were not). All responses were then anonymised (interviewee details stored separately to their answers, using a UID system for file naming).

The response data types determined that this report analysis is largely descriptive, with narrative summaries and graphical presentation of summary data in various chart forms (see *Appendix 3*).

Data was manually categorised by Interpretative Phenomenological Analysis (coding), to reflect (categorical) perceptions of interviewees (e.g., strength of response: 1-5, +ve motivations and -ve barriers), using an inductive design, as opposed to a deductive design.<sup>1</sup>

Where responses could be ordered on a sliding scale, coding reflected the strength of response on a scale of Strong Positive, Dependent Positive, Unsure Inviting,<sup>2</sup> Non-Committal, Negative.

For categorical responses, keywords and phrases were used: Climate Change / Net Zero, Local Environment / Low Emissions, Time / Fleet Renewal, Cost / Scalability, Technology / Skillset; HFCEV, EV, Bio-CNG, HVO, Other / Open, Unknown.

Responses to questions eliciting ordinal categories could be placed in sequence: Complete, In-Process, Scheduled, Unknown; or Active, Planned, In-Discussion, None, Unknown.

Datasets, cleaning, coding, basic analysis and outcomes (graphics, reports and presentations), were collated and composed using generally accessible formats including, XLSX, DOCX, PDF, in Office, Google Docs and LibreOffice. Spatial representations and analyses were carried out in QGIS.

To help present the data geographically whilst maintaining anonymity as far as possible, local area authorities were approximately grouped into broadly regional Voronoi cells (Dirichlet patterns, tessellations, or Thiessen polygons),<sup>3</sup> for illustrative purposes only, and regional differences will not be discussed.

<sup>1</sup> Inductive coding is a ground-up approach where codes are derived from data rather than preconceived notions of what the codes should be. This allows the narrative or theory to emerge from the raw data itself which is apt for exploratory research. This compares to deductive coding which is a top down approach beginning with a developed codebook which can be based on research questions or an existing research framework or theory. The data is then read and codes assigned to excerpts so that at the completion of analysis, codes still closely resemble the codebook. (Ho and Limpaecher 2020).

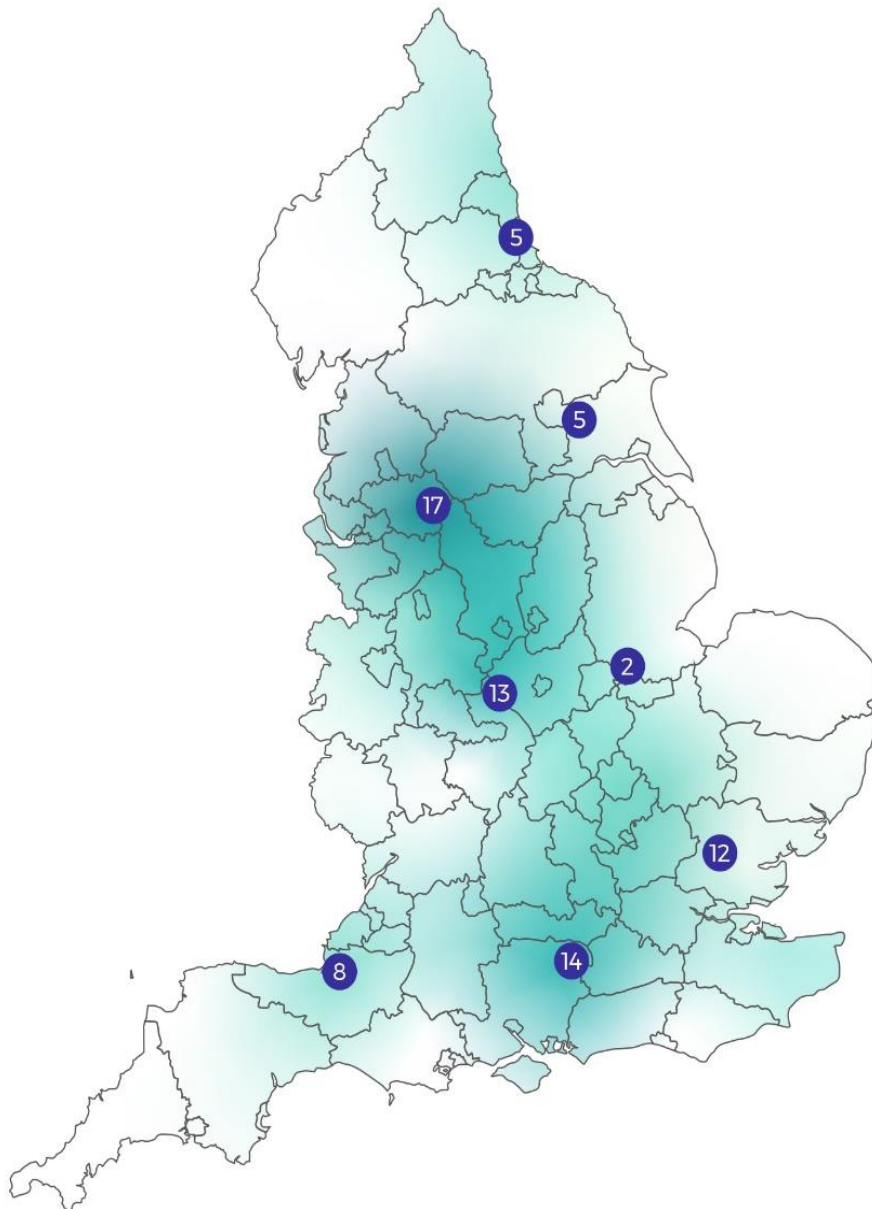
<sup>2</sup> Open to opportunities, but unsure about potential uptake, i.e., unable to give the conditional acceptance of "Dependent Positive", but more invested than "Non-Committal".

<sup>3</sup> Each cell contains an official council office address, but rather than defining local area authorities explicitly by location, the polygon boundaries shown perfectly (mathematically) divide the space shared with neighbouring council locations.





Map 3: Distribution (green 'heatmap') of the 77 councils in England included in the study (shown grouped by approximately 70 miles (100 km) intervals (tally marked within green circles), on a map of local area authorities, and the major road network)





## Findings

### Battery Electric Vehicles (BEVs)

BEVs are undoubtedly a strong zero-emission option for passenger vehicles. However, HGVs are a special case. Depending on circumstances, electric HGVs do not yet always perform as well as diesel models. When making decisions about BEV technology, HGV fleet managers have unique requirements not shared with domestic consumers.

A principal consideration is the range of electric HGVs for council-specific requirements. The range of BEV HGVs depends on the model of the vehicle, functional overheads (e.g., bin tipping for electric RCVs), and the combined weight of freight and the vehicle itself. Accordingly, estimates for a single charge range from 75 to 215 miles, with top speeds between 50 and 75 mph (Ellmore, 2023).

Another consideration is the upfront cost. Electric charging is projected to be cheaper than existing fossil fuels. But, when balancing budgets, the initial capital expenditure for new technology is a major consideration. Compared to the approximately £70,000-£150,000 cost of diesel HGVs, the approximate starting price of electric HGVs is between £140,000 and £200,000 (Ellmore, 2023).

Electrification appears as the predominant solution for the decarbonisation of council fleets according to 56% of the councils who responded to this study. However, the practical challenges of BEVs for most councils have not yet been addressed.

*We have looked long and hard at replacing our entire fleet (54 road vehicles) with electric vehicles. We asked [Association for Public Service Excellence] APSE to assist us in carrying out a survey on infrastructure etc. Unfortunately at this moment in time we have taken the decision not to go down the electric route, but to consider it again in 4/5 years' time. We took the cost of infrastructure and vehicles into consideration as well as reliability and performance of the vehicles etcetera.*

Employed Council FDM, District Council

*Due to the rurality of our district, lower emission vehicles are not suitable at present due to the distance and terrain the vehicles are required to travel across. Once the technology is viable, we will seriously consider low emission alternatives. We are looking at alternative fuels currently to try and reduce our carbon footprint.*

Councillor FDM, District Council

*Electric HGVs are available for routine work requirements but the nature of work and asset lifecycle duration of our fire appliances presents some challenges presently – conventional HGVs work in scheduled patterns to allow planned charging, our appliances are responsive 24/7 so are more challenging from a charging perspective, also there haven't presently been any studies of the effects of low/sporadic use on batteries which may affect life cycle planning.*

Employed Council FDM, City Council

*We need both fit-for-purpose vehicles AND the infrastructure in place before we commit to move away from what we know actually does what we need (i.e., diesel/HVO ICEs). I do not want to split the fleet in any way; i.e., have some electric freighters and some HVO freighters as I need full flexibility to send any freighter anywhere; I do not want to introduce a range limitation on any of the freighters.*

Employed Council FDM, County Council





Initial capital expenditure is a major barrier to fleet replacement with BEV HGVs. At much higher prices than ICE petrol and diesel, Bio-CNG and HVO models; BEV HGVs pose a large burden on budgets in the absence of proportional support through UK Government subsidies and targeted funding.

### Bio-Diesel Compressed Natural Gas (Bio-CNG)

There are approximately 4,000 CNG refuelling stations situated across Europe (CNG Europe 2023, LNG Prime 2023), over a quarter of which are supplying Bio-CNG to

domestic customers. This is in stark contrast to the current development of equivalent infrastructure in the UK: for example, a main market leader, CNG Fuels, operates only 10 public-access stations, with a further three sites under construction and four more planned for the end of this year (Roberts 2023).

Despite its benefits, Bio-CNG was the least known and understood alternative fuel type reported by councils. Hydrogen, BEV and HVO were all better known. Those that did understand it, tended to view it as a better alternative than other fuel types.

*Bio-CNG for council vehicles would be an excellent fuel source and we should explore this option [...] this option would be cheaper than most alternative lower emissions options and would be simpler for drivers and maintenance staff to maintain and run these vehicles. Implementing a supply for this (in theory) should be more straightforward than upgrading substations and installing 100's of charge points*

Councillor FDM, District Council

Bio-CNG is a viable alternative for HGV fleets, but the lack of infrastructure is a problem for many councils. Only c.10%

of the councils in this study considered it an option to move forwards.

*Whilst Bio-CNG is a virtuous fuel it will only be able to be utilised in closed loop operations with significant volume, such as supermarket distribution hubs or dedicated highways depots where the draw of fuel from a single location is large enough to justify and support the infrastructure cost. Also within an urban environment, zero tailpipe emissions from EV is preferable to low tailpipe emissions from CNG.*

Employed Council FDM, District Council

*We do have [FIRE SERVICE] within the organisation which is not standard within the UK [...] As the services provided and mix of in-house and contracted out services varies in each council, the solutions for each authority are different – i.e. providing Bio-CNG to a county highways department where all vehicles are based at the same site, such as [CONTRACTOR], is much more economically and practically viable than providing alternative fuelling for 50 fire appliances dispersed between 25 fire stations across a county. [TRANSITION] was started in 2019 and will complete by 2030, with the exception of some heavy vehicles in use with [FIRE SERVICE], to align with the councils 2030 net zero carbon from operations commitment – the heavy vehicles in use with [FIRE SERVICE] have a 15-20 year life cycle and are not yet available as zero tailpipe emissions, so ICE vehicles purchased this year and next year will still be in use up to 2040.*

Employed Council FDM, County Council





Bio-CNG is sourced entirely from the anaerobic digestion of organic waste and does not involve fossil gases, making it one of the most impactful, immediate, low-emission fuels available for HGV fleets. For example, Aldi is reported to have already adopted Bio-CNG for its HGVs, “cutting emissions by over 90% and saving up to 40% on lifetime fuel costs.” (Bayford 2022). However, there is a high initial outlay in capital investment when installing Bio-CNG plants, and Bio-CNG refuelling stations are supplied from the National Grid, requiring dedicated at-pressure systems to store and deliver the fuel. It has also been noted that sources of organic matter, especially agriculture, may be seasonally dynamic, causing concern of the consistency of fuel supply.

### Hydrotreated Vegetable Oil (HVO)

One of the biggest benefits of HVO (as with Bio-CNG), is that many HGVs are already compatible with HVO, meaning capital expenditure on new HGVs is reduced. However, to power HGVs, HVO needs to be mixed with mineral diesel (e.g., 30% HVO). In trials, this reduces GHG emissions up to about 50% versus diesel (e.g., Pelkmans et al. 2012, Suarez et

al. 2019, Dobrzyńska et al. 2020, Verger et al., 2022; although manufacturers tend to claim up to 90%). HVO therefore still produces GHGs, with little reduction in NOx and particulates (e.g., Dimitriadis et al. 2018). Other concerns with HVO are:

- Its price is approximately 10% higher than traditional diesel, and liable to the same excise duty rates under the Hydrocarbon Oil Duties Act 1979;
- HVO demonstrates mixed efficiency depending on the manufacturing process and the source of raw materials. For example, Fatty Acid Methyl Esters (FAME), a version largely made from rape seed oil, performs poorly;
- When produced from palm oil or its derivatives, HVO will be contributing to deforestation and its global consequences, and the high GHG emissions associated with that industry;
- In resource-poor countries, HVO production may compete with food supplies.

While 60% of fleet managers in the study were aware of HVO, only 42% considered it an option for fleet transition, and then only as an interim solution.

*At present we are trialling HVO fuel in part of our HGV fleet as we cannot see any alternative fuel vehicles at present that meet our financial requirements both in terms of cost of vehicles and cost of infrastructure.*

Councillor FDM, District Council

### Status of Council HGV Fleet Transition

Approximately half (49%) of the councils in this study reported that their decarbonisation plans were underway. Only one council in England has effectively completed their plans for transition, because they outsource their bus service to a third party which is working towards a 2035 zero

emission target. Strategies for fleet transition are in place for 75% of councils, with 30% of those councils already employing or considering adopting HVO as an interim solution.

*We are currently carrying out a series of vehicle trials to ensure the concept will work and that EVs will meet the demands we will put on them with a high level of reliability. Funding secured for 2023/24.*

Council Employed FDM, District Council





*As a fleet we only directly operate two vehicles above 7.5 tonnes. They have both been running on HVO fuel since November 2022 and although the vehicles are due for replacement this year we will still continue the use of HVO with their replacement diesel engine vehicles. Our waste management services are currently contracted out but they return "in house" April 2024 and again conventional diesel engine vehicles are being procured and again will run on HVO fuel. Buses are currently retrofitted with Euro 6 compliant diesel engines although a programme to replace them with electric vehicles has now started with the first being delivered a couple of weeks ago.*

Councillor FDM, District Council

## Council motivations

Council FDMs reported high levels of awareness of the general nature of the climate change challenge. Many respondents also reported that their council already either had a clear transition plan, had one in development or the council had declared a climate emergency to show the

priority of the transition in all their decision making. It was therefore clear that Councils throughout England are aware of their role in reducing GHG emissions, and their responsibility towards protecting local environments from transport generated pollution.

*"[In our council] the transition to lower emission vehicles began in December 2022 when a Fleet Decarbonisation Plan was created. The plan is set out in phases and aims to see the Council's fleet being 100% ULEV compliant by 2030, when the UK Government intends to ban the sale of new petrol/diesel vehicles."*

Employed Council FDM, County Council

*"Our council has declared a climate emergency, so there is a strong political and strategic desire for our city to be a healthy place to live / work and air quality to be improved. The project has begun now as it is recognised the amount of work, considerations and funding required to achieve our aims is complex, expensive and time consuming."*

Councillor, District Council

*We want to become carbon neutral. Want to get more involved in renewables. If the lower emission fuels are cheaper to purchase in the long run, then that is a necessity. Funding is a major problem. Infrastructure is also a problem. Contracts that are currently in place predate the need for sustainability.*

Councillor, County Council

When asked about their council's plan for transitioning transport, respondents were quick to explain their transition plans for non-HGV fleets. However, for many councils, there was an absence of planning for HGVs. There were also very

low levels of understanding about when the ban on new ICE HGV sales is coming into force. However, some councils fully understood this, had explored it, and had clear plans and assumptions in place driving those plans.





*It would cost approximately £2.5M to electrify the depot should EVs become a viable option. There is potential for bio-methane to become an option should anaerobic digestion sites become viable if the collection of food waste as a separate waste stream is implemented. It is likely [COUNCIL] will continue to purchase HVO compatible IC engined refuse freighters right up to the current sales deadline (2030 for 26t, 2035 for 32t). I need fit for purpose freighters and an ICEd freighter is fit for purpose.*

Employed Council FDM, County Council

Out of the 77 councils that responded, not one expressed scepticism about climate change or the need for councils to transition their fleets. In fact, most expressed a preference

for this transition to happen faster and appeared somewhat frustrated that in their eyes, there were still many barriers to overcome before the transition could occur.

## Barriers

### Infrastructure costs

The principal barrier councils face when planning their switch to low-emission HGVs is the cost of transitioning their infrastructure. This was true across all solutions (BEVs, HVO, Bio-CNG or HFCEV):

*No plan in place yet, technology is not there yet for electric vehicles and some alternative fuels have no guarantees that virgin materials and palm oils are not being used. Bio-CNG has increased costs, [lack of] availability, and inefficiency. HFCEV technology is getting there but there is no infrastructure readily available yet without capital investment.*

Councillor, County Council

*The location/availability of infrastructure remains an issue for all fleets looking to change to alternative fuel sources. A HGV which runs on CNG has been ordered and this will replace an existing diesel vehicle*

Employed Council FDM, District Council

*We are unable to transition to BEVs at present (other than 5 we have on order for September) because we need to move to a larger depot and therefore we will not invest in EVCI [Electric Vehicle Charging Infrastructure] at our current depot. Our HGV fleet is now largely running on HVO as an interim measure to reduce our emissions.*

Employed Council FDM, District Council

### Incompatibility with Council Fleet needs

The next barrier related to range, reliability, and suitability of BEVs for the unique tasks of council HGVs. However, some councils had invested in trials of BEV vehicles, including for refuse trucks. One council reported that they had already electrified their refuse HGV fleet.

*It would depend on a number of factors such as purchase cost of the vehicles, reliability, refuelling time, running costs and is the vehicle fit for purpose? We would have trial vehicles before committing and ensure the necessary funding is available.*

Councillor, District Council





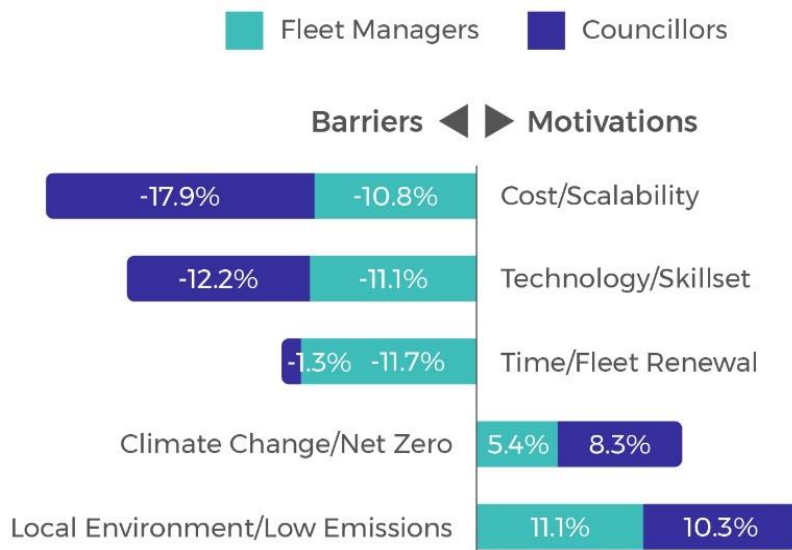
## High upfront costs of vehicles

Many councils reported being under severe budget constraints for the past decade, meaning respondents believed the cost of purchasing more expensive (BEV, HFCEV) HGVs was not currently realistic.

*The running cost would be lower, but the initial outlay would be costly. Councils are cash-strapped, replacing serviceable vehicles before the end of their lifespan wouldn't be on the agenda.*

Councillor, District Council

**Chart 1: Motivations and barriers for councils' transition to low emission HGVs/ buses (comparison of fleet managers and councillors)**



## Perceptions

ESDO's research uncovered the perceptions of low emission fuelling options for HGVs within councils:

1. Many councils were focused on, and distracted by, BEV. They are waiting until BEVs are sufficiently mature and available in all the varieties of HGVs they require, before transitioning any vehicles.
2. A minority of councils were not waiting for BEVs and had begun to transition their HGV fleets to HVO as an interim step towards zero tailpipe emissions.
3. When asked about the potential of Bio-CNG, many

respondents stated this was an attractive option for HGV conversion but would require the infrastructure/investment to support it.

## Awareness of available options

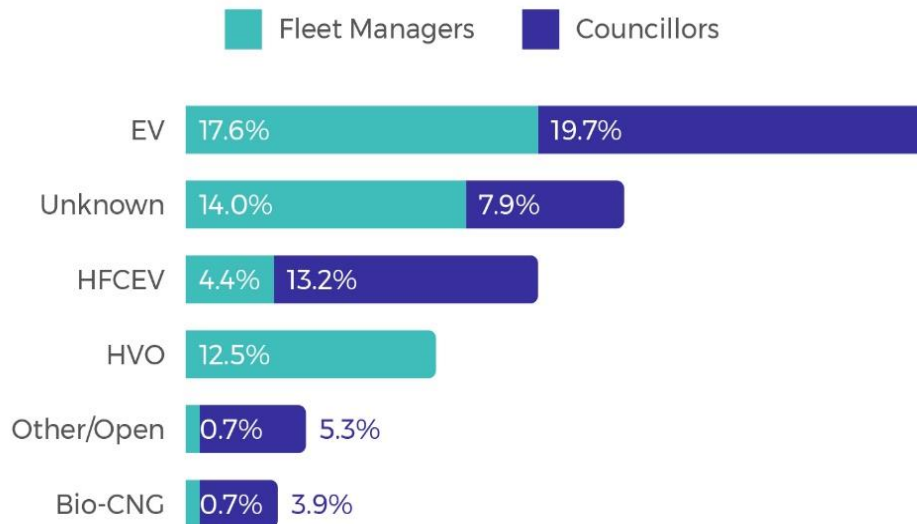
Knowledge of alternative fuel types amongst FDMs is surprising low. Further education and information sharing is needed to help councils make better informed decisions on decarbonising the HGV fleets.







## Chart 2: Councils' knowledge of fuel alternatives for HGVs (comparison of fleet managers and councillors)



*At this exact moment in time the council has no other option other than diesel for its HGV fleet. Again, a hydrogen fuelling station is being considered to submit a bid for funding, but these are at an early stage. Additionally, the council is working with a new EV charging supplier to increase the availability of electric charge points across the borough, but these are less likely to be considered as a viable fuel source.*

Employed Council FDM, County Council

*A hydrogen/electric refuelling station is being built in the area, but the technology and support infrastructure is still not where it would instil confidence.*

Employed Council FDM, District Council

*We have already started, although at a very slow pace. We purchased an 18-ton electric gully tanker last year but we are now limited due to power supply at our main depots. We have explored replacing our refuse collection fleet with electric powered vehicles and other HGVs with compressed natural gas (CNG). However, the complexities and challenges of replacing these now are mainly due to lack of infrastructure available. Major investment is needed to upgrade substations and carry out the necessary civil works needed for a larger electric supply to depots. Other alternatives such as nitrogen and CNG are just not available locally for us to utilise yet. Also, implementing electric charging will impact the amount of allocated parking spaces available to existing sites, so it will be most likely that any major change here will mean relocating vehicle fleet between sites. This has lots of other service-related implications that haven't been explored yet.*

Employed Council FDM, Country Council





*We have looked at alternative fuel vehicles as part of the replacement program. Many specialist vehicles simply don't exist, some EV RCV's have been trialled but unfortunately found to be not fit for purpose due to lack of range. Options for EV social services buses are being looked at presently as part of the replacement program. No firm plan or time scale in place for completion. Hydrogen or CNG may be an option going forward but infrastructure is currently unavailable, the siting of any hydrogen or CNG facilities may bring challenges at our current sites due to site capacity. The additional cost pressures are also prohibitive.*

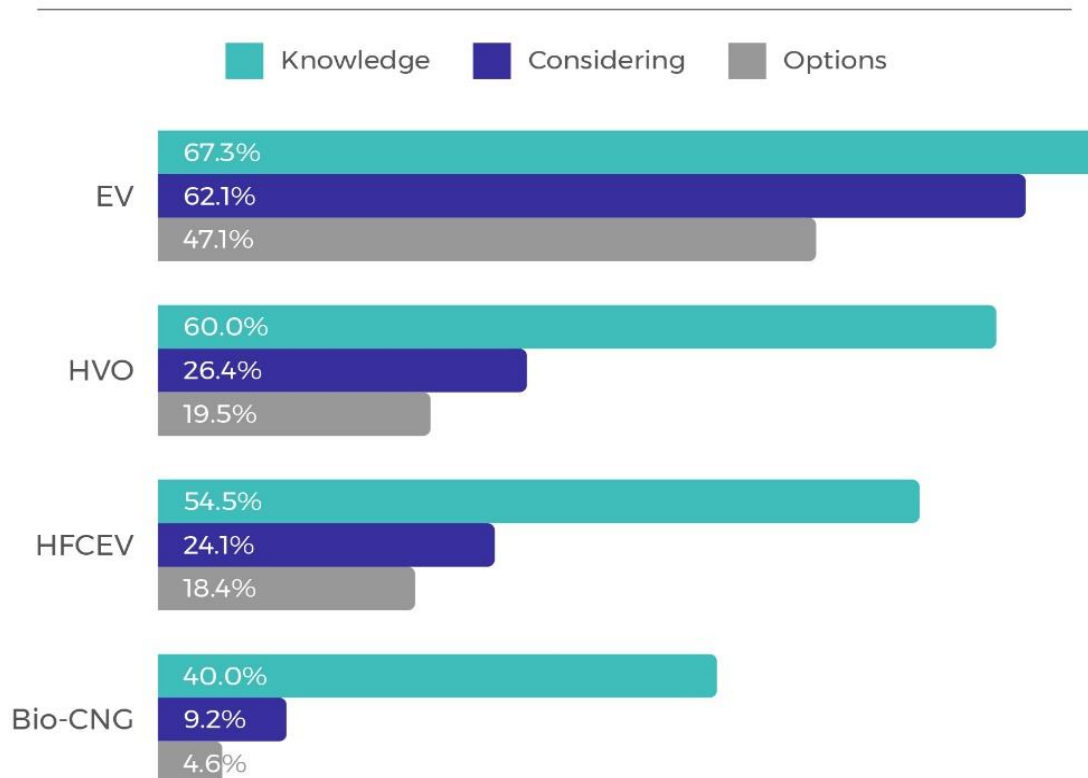
Employed FDM, District Council

### Infrastructure availability and fuel choice

As shown in the comparison of the QI responses in Chart 3, councils report alternative fuel infrastructure to be limited, with 47% reporting BEV charging infrastructure as available in their area; 20% reporting HVO was available; 18% reporting HFCEV available and only 5% reporting Bio-CNG

as available. The effect of the perceived lack of infrastructure on transition planning is clear to see: 62% of councils are considering BEV, 26% HVO, 24% HFCEV and only 9% are considering Bio-CNG.

**Chart 3: Knowledge of alternative fuels and progress in considering each fuel versus options for refuelling infrastructure (all respondents)**





Unsurprisingly, alternative fuels under consideration by both fleet managers and councillors were closely allied to the type of refuelling infrastructure thought to be readily available. The only disparity is HVO which was solely mentioned by fleet managers, not councillors. There was also a marginal preference amongst councillors for EV, HFCEV and Bio-CNG.

The types of alternative fuels considered by respondents were closely allied with perceived availability of refuelling infrastructure. This suggests that the type of local infrastructure impacts council decision-making for how to decarbonise, and that greater investment in infrastructure will accelerate the adoption of alternatively fuelled HGVs.

*Yes it would as that makes the transition more financially viable. HVO we can do onsite so this isn't a problem. Electric charging or hydrogen requires substantial investment.*

Councillor FDM, District Council

There was a strong indication that more refuelling infrastructure, especially for bio-CNG, BEV and HFCEV, would lead to greater adoption. Over a third of councils (37%) indicated that they would 'definitely use' such facilities,

and another quarter would 'under certain conditions'. The remaining 38.1% of councils were either tentatively interested, or unable to commit to such a proposition, often because of depot-based considerations and fleet location.

*Probably but there would need to be a review of fleet revenue budgets as these alternatives appear to be more expensive than conventional fuels. The fleet is currently parked up in the evenings at a number of locations situated around the county so some vehicles may not be near such facilities.*

Council Employed FDM, County Council

*The Council would have need to establish charging infrastructure at its fleet vehicle operating centre at which vehicles are parked/operated. However, given the strategy [...], our operating centres have not at this time been assessed to understand development needs.*

Council Employed FDM, District Council

## Trials Underway

### BEV

Enfield Council is operating its first fully electric RCV (Enfield Council 2023), and Manchester City Council have introduced a fleet of 27 fully electric RCVs (SMMT 2022). In both cases, refuelling is carried out at on-site depots, and EVs are best suited to routes limited to 50 miles within urban centres. Similar approaches in less densely populated areas have faltered due to the lack of refuelling infrastructure

(York: Whitbread 2023), battery range and reliability, and the lack of in-house skills to maintain electric RCVs (Somerset: Mumby, 2022).

One council who trialed BEV RCVs was included in this study and was overwhelmingly positive about the trial:

*The benefits we have seen from EV extend beyond emissions and financial savings – the instant torque is resulting in higher productivity, the reduced vibrations and noise leave our drivers reporting less headaches, lower stress levels and a reduction in them feeling dirty at the end of the day so we're quite committed to adopting electric as the fuel source for our fleet as quickly as possible. Our fleet is currently 51% electric and we expect that to continue. From a simply logistical point of view, I wouldn't be keen*





*on the negative congestion and particulate matter implications caused by having a HGV fuelling station near to our city centre depot, regardless of what sort of fuel is in it. Having a station further out would reduce productive time and air quality, congestion, etc.*

Employed Council FDM, City Council

### Bio-CNG

Camden Council has switched its Veolia RCVs to Bio-CNG, and Reading Council has made the same switch for its bus fleet. Notably, both have introduced on-site (“bunkered”) refuelling facilities at its fleet depots. The attractive nature of Bio-CNG as a renewable source of energy, and the relatively

advanced technology, within the framework of an expanding refuelling infrastructure, undoubtedly suggests this fuel types as one of the best options available to councils, upon which to base their strategies for HGV fleet transition.

## Council Fleet Decision Making

Fleet managers seem less confident than councillors about the long-term prospects for fleet transition, preferring HVO as an interim solution, whilst technology and confidence progresses in BEV. In contrast, councillors omitted to mention HVO, and were overall more confident in emerging technologies and the prospects for HGV decarbonisation. It is notable that councillors occupy an electorate-facing role,

so positive messages about emission reductions may have some additional political function (“political will” was identified as a motivation). Also, it is somewhat unclear from this study to what degree fleet managers are involved in the decision-making process, which may also account for this disparity.

**Chart 4: Comparison of fleet managers and councillors views on the acceleration of fleet transition by introduction of refuelling infrastructure**





## Infrastructure uptake

There were very few cases where low emission refuelling facilities are already being used by councils. In the cases where infrastructure isn't being used, plans for future utilisation seem uninformed. For example, one council reported looking at solar power for EV charging, being entirely unfamiliar with Bio-CNG and having discussed hydrogen. This lack of knowledge was not isolated, and strongly suggests the desperate need for education and information sharing within the sector, especially between

technically oriented council operatives with knowledge of low emission technologies.

Ultimately, councils in England are unified that the lack of infrastructure limits their ability to set their transport decarbonisation strategy. Over two-thirds (68.3%) of all councils included in the study stated that they would both utilise HGV low emission infrastructure AND saw its potential in accelerating the council transition of their HGV fleet to low emission alternative fuels.

*There would be many variables to consider when making the transition to lower emission fuels however, having the infrastructure in place would allow us to make an informed decision on the way forward.*

Council Employed FDM, District Council

*The transition to a zero emission HGV fleet has no definitive start or completion date. The Council has engaged consultants to conduct a feasibility study to create a micro grid by expanding our existing solar farm to incorporate our transport depots and various other civic buildings. Once this study is complete and we have proof of concept the Council will develop and install the required infrastructure for depot charging points. It is anticipated that infrastructure installation will begin sometime during 2025 although this has yet to be confirmed and is dependent on the funding streams available.*

Council Employed FDM, Unitary Authority





## Conclusions

The findings from this study suggest that decarbonisation planning is being informed by *ideals* for reducing emissions, rather than what is possible now. While the motivations for this behaviour are well-meaning (mitigating climate change and improving local environments) it is preventing more action being taken in the near-term.

Bio-CNG and HVO are commercially viable technologies that are already available to councils to decarbonise their HGVs. While they are not zero emission at the tailpipe, they produce significantly less emissions than ICE. While the industry awaits progress on zero emissions technologies, councils should consider Bio-CNG and HVO as interim measures. To support this transition, councils require investment from government or private-public partnerships with emerging Bio-CNG refuelling providers.

UK Government funding for the acquisition of ZEVs should be allocated *early enough* and in parallel to the rollout of low-emission refuelling infrastructure. This would enable councils to meet the UK Government legislative targets and coincide ZEV purchases with HGV replacement cycles.

HGV refuelling infrastructure must be suitable for the specific and unique needs of a council HGV fleet. Specifically, HGV low emission refuelling infrastructure needs to be:

- Sited strategically to facilitate council service operations;
- Appropriate for the best suited HGV technology for council service provision;
- Providing a fuel that is ethically sourced with no hidden carbon costs;

→ Offering a sustainable and reliable fuel supply.

Lastly, regarding decarbonisation strategies, councils in England would benefit from increase information sharing between fleet managers and other decision makers. They should also explore the potential for more collaboration across regions. Strategy may be strengthened by identifying commonalities between local area authorities, with a view to sharing concerns and budgetary stresses, discovering similarities, and finding mutually beneficial operational solutions, including the sharing of infrastructure.

This study confirmed the strongly held views in English councils that there are still many issues remaining if HGV fleets are going to decarbonise. These views are relatively universal, shared between councils across neighbouring regions and throughout England.

The message is clear. In the absence of sufficient and accessible infrastructure, councils will continue to lack good options for decarbonising their HGV fleets.

Councils are facing competing priorities – to maintain seamless provision of transport-related public services and to decarbonise their HGV fleets.

Delivery of these objectives must run in parallel, so that decarbonisation takes place in alignment with vehicle replacement cycles, budgetary pressures, operational logistics, and various other pressures associated with an efficient and reliable provision of public services.





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## Annex B – Contacted Councils

Amber Valley Borough Council	Chorley Borough Council	Guildford Borough Council
Ashfield District Council	City of York Council	Halton Borough Council
Ashford Borough Council	Cotswold District Council	Hampshire County Council
Barnsley Borough Council	Coventry City Council	Harborough District Council
Basildon Borough Council	Crawley Borough Council	Harlow District Council
Basingstoke & Deane Borough Council	Cumberland Council	Harrogate Borough Council
Bassetlaw District Council	Cumbria County Council	Hart District Council
Bath and North East Somerset Council	Dacorum Borough Council	Havant Borough Council
Bedford Borough Council	Darlington Borough Council	Hertfordshire County Council
Birmingham City Council	Dartford Borough Council	Hertsmere Borough Council
Blaby District Council	Derby City Council	Hinckley and Bosworth Borough Council
Blackburn with Darwen Borough Council	Derbyshire County Council	Horsham District Council
Bolsover District Council	Derbyshire Dales District Council	Huntingdonshire District Council
Bolton Borough Council	Devon County Council	Hyndburn Borough Council
Bracknell Forest Borough Council	Doncaster Borough Council	Kent County Council
Bradford City Council	Dover District Council	Kirklees Borough Council
Braintree District Council	Dudley Borough Council	Knowsley Borough Council
Brentwood Borough Council	Durham County Council	Lancashire County Council
Bristol City Council	East Cambridgeshire District Council	Lancaster City Council
Bromsgrove District Council	East Devon District Council	Leeds City Council
Broxbourne Borough Council	East Hampshire District Council	Leicester City Council
Broxtowe Borough Council	East Hertfordshire District Council	Leicestershire County Council
Buckinghamshire Council	East Riding of Yorkshire Council	Lichfield City Council
Burnley Borough Council	East Staffordshire Borough Council	Lincolnshire County Council
Bury Borough Council	Eastleigh Borough Council	Liverpool City Council
Calderdale Borough Council	Eden District Council	Luton Borough Council
Cambridge City Council	Epping Forest District Council	Maidstone Borough Council
Cambridgeshire County Council	Epsom & Ewell Borough Council	Malvern Hills District Council
Cannock Chase District Council	Erewash Borough Council	Manchester City Council
Carlisle City Council	Essex County Council	Mansfield District Council
Central Bedfordshire Council	Fareham Borough Council	Medway Council
Charnwood Borough Council	Fenland District Council	Mid Devon District Council
Chelmsford City Council	Folkestone and Hythe District Council	Middlesbrough Borough
Cheltenham Borough Council	Gateshead Borough Council	Milton Keynes Council
Cherwell District Council	Gloucester City Council	Mole Valley District Council
Cheshire East Council	Gloucestershire County Council	Newark & Sherwood District Council
Cheshire West and Chester Council	Gosport Borough Council	Newcastle Upon Tyne City Council
Chesterfield Borough Council	Gravesham Borough Council	Newcastle-Under-Lyme Borough Council







Decarbonising English Council HGV Fleets  
Perceptions, Plans & Barriers

- |  |  |   |
|--|--|---|
| North Devon District Council               | Sefton Borough Council                   | Three Rivers District Council           |
| North East Derbyshire District Council     | Selby District Council                   | Thurrock Council                        |
| North East Lincolnshire Council            | Sevenoaks District Council               | Tonbridge & Malling Borough Council     |
| North Hampshire Council                    | Sheffield City Council                   | Trafford Borough Council                |
| North Hertfordshire District Council       | Slough Borough Council                   | Uttlesford District Council             |
| North Kesteven District Council            | Solihull Borough Council                 | Wakefield Metropolitan District Council |
| North Lincolnshire Council                 | Somerset County Council                  | Walsall Borough Council                 |
| North Northamptonshire Council             | Somerset West and Taunton Council        | Warrington Borough Council              |
| North Somerset Council                     | South Cambridgeshire District Council    | Warwick District Council                |
| North Warwickshire Borough Council         | South Derbyshire District Council        | Warwickshire County Council             |
| North Yorkshire County Council             | South Gloucestershire Council            | Watford Borough Council                 |
| North-East Lincolnshire Council            | South Kesteven District Council          | Welwyn Hatfield Borough Council         |
| North-West Leicestershire District Council | South Lakeland District Council          | West Berkshire Council                  |
| Nottingham City Council                    | South Ribble Borough Council             | West Devon District Council             |
| Nottinghamshire County Council             | South Somerset District Council          | West Lancashire District Council        |
| Nuneaton & Bedworth Borough Council        | South Staffordshire District Council     | West Northamptonshire Council           |
| Oldham Borough Council                     | Southampton City Council                 | Westmorland & Furness Council           |
| Oxford City Council                        | Spelthorne Borough Council               | Wigan Borough Council                   |
| Oxfordshire County Council                 | St Albans City Council                   | Wiltshire Council                       |
| Pendle Borough Council                     | St Helens Borough Council                | Winchester City Council                 |
| Peterborough City Council                  | Stafford Borough Council                 | Windsor and Maidenhead Borough Council  |
| Portsmouth City Council                    | Staffordshire County Council             | Woking Borough Council                  |
| Preston City Council                       | Staffordshire Moorlands District Council | Wolverhampton City Council              |
| Reading Borough Council                    | Stevenage Borough Council                | Worcester City Council                  |
| Redcar and Cleveland Borough Council       | Stockport Borough Council                | Worcestershire County Council           |
| Redditch Borough Council                   | Stoke-on-Trent City Council              | Wychavon District Council               |
| Reigate & Banstead Borough Council         | Stratford on Avon District Council       | Wyre Borough Council                    |
| Richmondshire District Council             | Stroud District Council                  |   |
| Rochdale Metropolitan Borough Council      | Sunderland City Council                  |   |
| Rossendale Borough Council                 | Surrey County Council                    |   |
| Rotherham Metropolitan Borough Council     | Surrey Heath Borough Council             |   |
| Rugby Borough Council                      | Swale Borough Council                    |   |
| Runnymede Borough Council                  | Swindon Borough Council                  |   |
| Rushcliffe Borough Council                 | Tameside Borough Council                 |   |
| Rushmoor Borough Council                   | Tamworth Borough Council                 |   |
| Salford City Council                       | Tandridge District Council               |   |
| Sandwell Borough Council                   | Test Valley Borough Council              |   |
| Sedgemoor District Council                 | Tewkesbury Borough Council               |   |

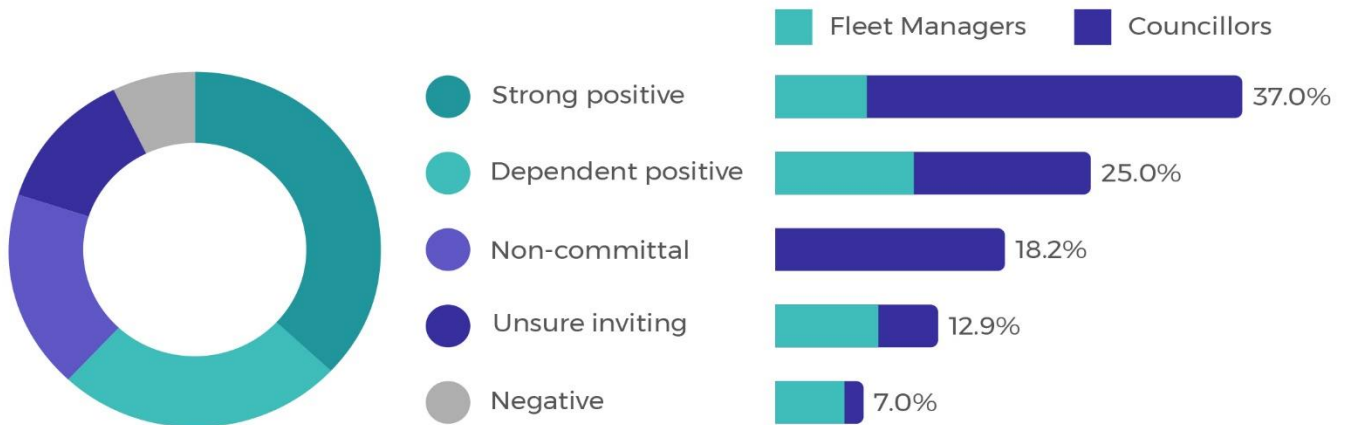




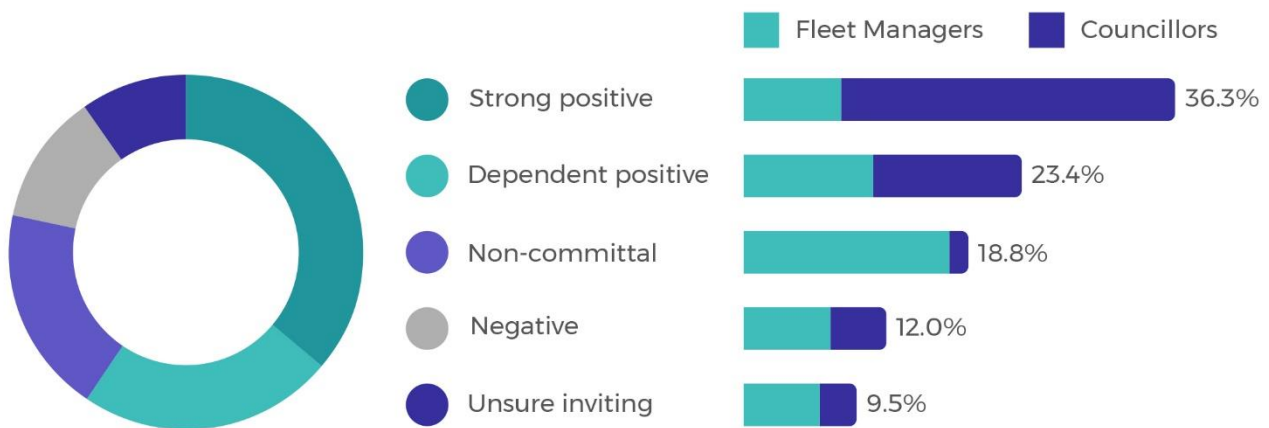
## Annex C – Q1 Responses

### Infrastructure

If refuelling infrastructure was available nearby for alternative fuel types such as Bio-CNG, would the council use those facilities?

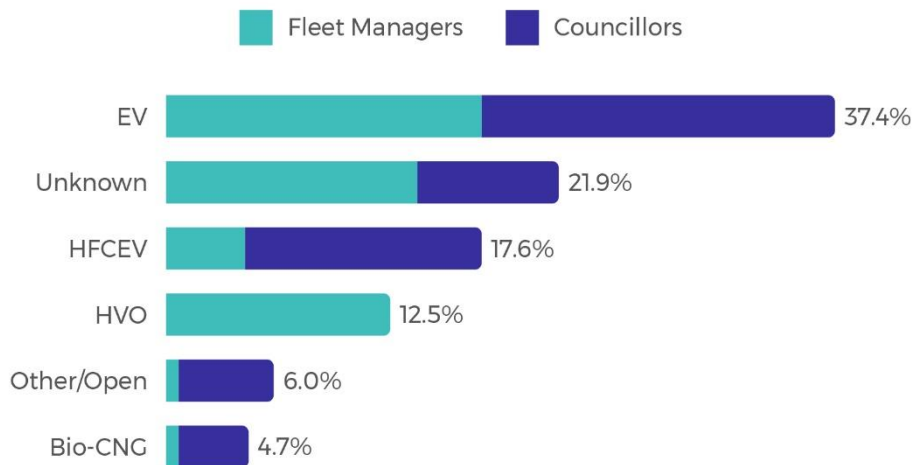


Would having infrastructure for alternative fuel types, such as Bio-CNG, nearby accelerate the transition of council HGVs and buses to lower emission fuels? Why/why not?



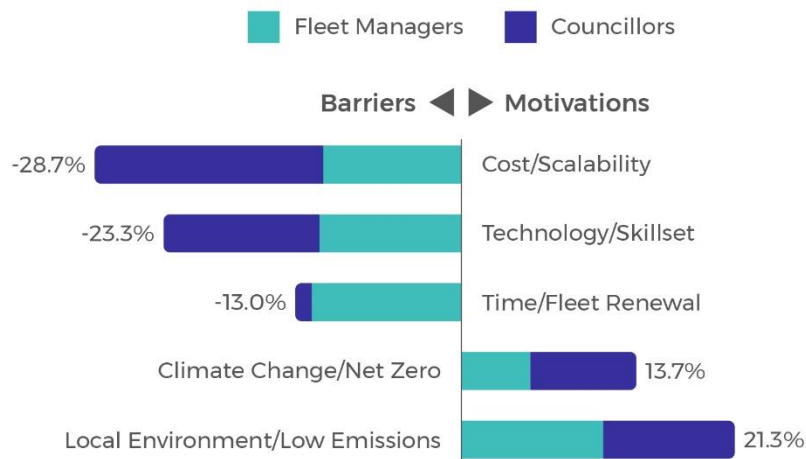


### What options does the council currently have, or believe the council will have soon, to replace diesel for HGVs and buses?



### Pressures

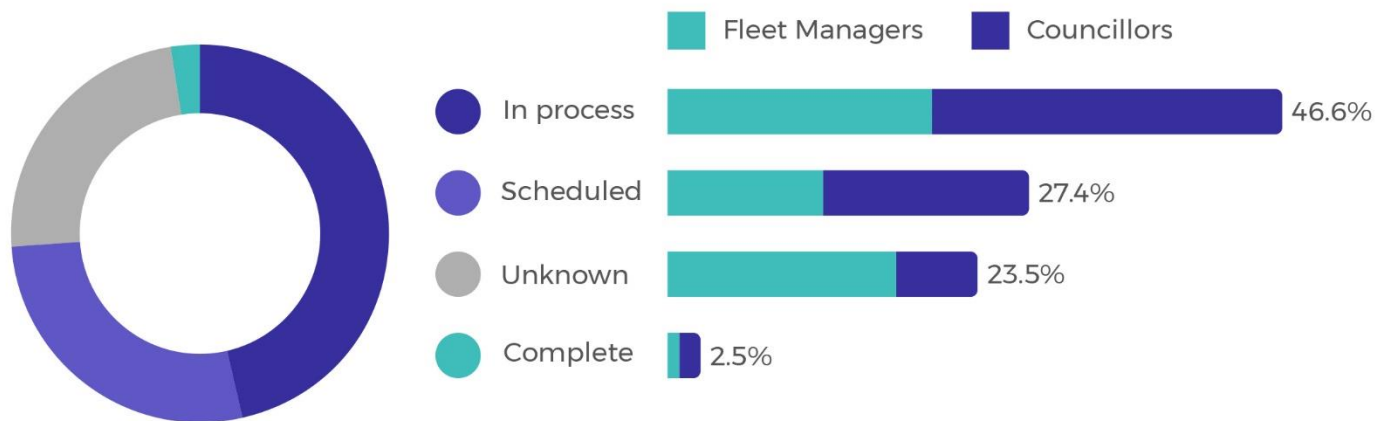
### What are the motivations and barriers for the transition to low emission HGVs/buses in your council?





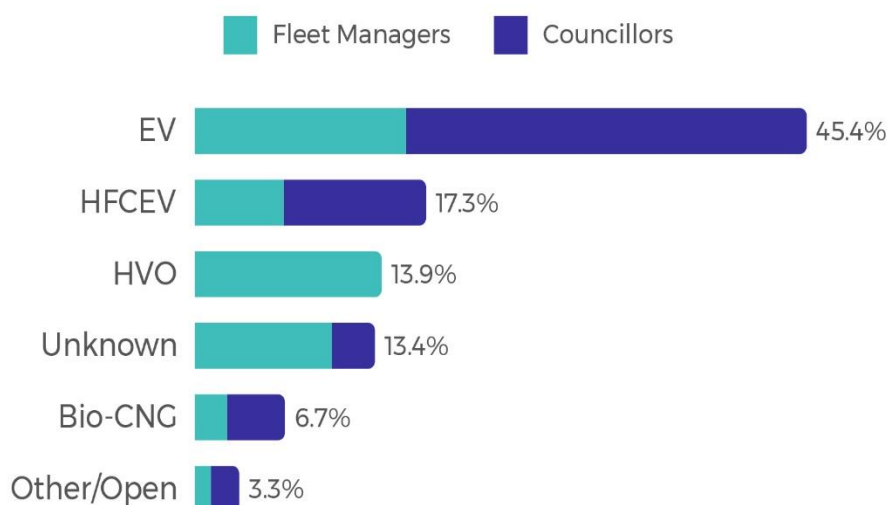
## Transition of HGVs

When will this transition to lower emission HGVs and buses start and be completed? Why at that time?  
If no plan is in place, why is that?



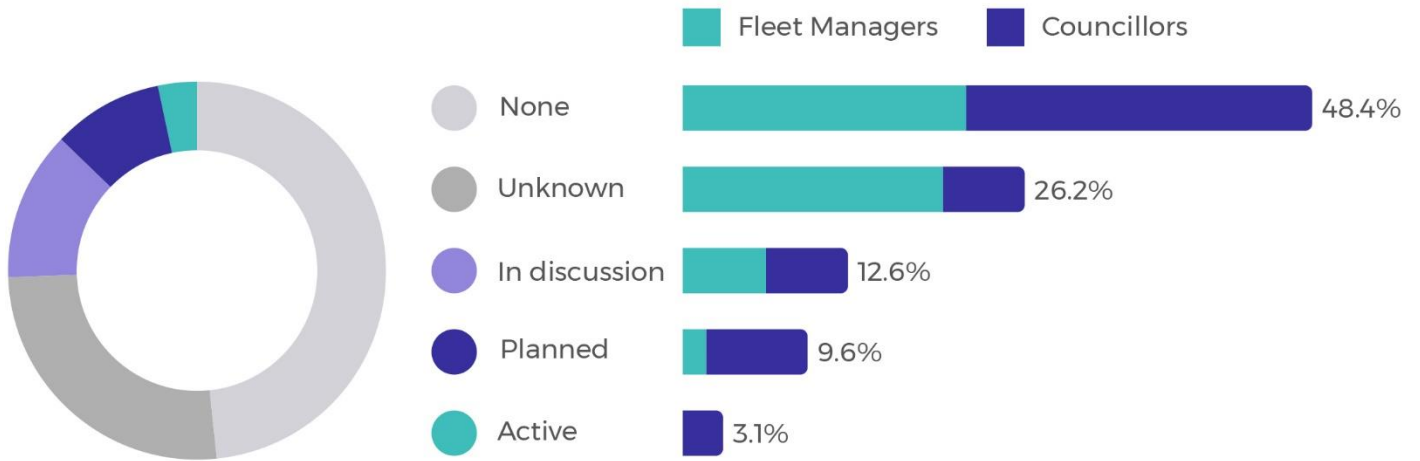
## Refuelling

About the council moving to lower emission HGVs and buses...  
Which fuel types is the council considering in its fleet transition?  
Why those fuels?





### Are Bio-CNG and HFCEV refuelling stations/hubs planned or in development in your council area? Is the council already in conversation with sources of Bio-CNG and HFCEV?





This research is just one of the many ways ESDO's work benefits local communities and advances our six missions.



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