**Key Decision – YES**

# HUNTINGDONSHIRE DISTRICT COUNCIL

**Title/Subject Matter:** Fleet Renewal and Infrastructure Improvement Strategy

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|---|---|
| **Meeting/Date:** | Overview and Scrutiny Panel (Environment, Communities and Partnerships) – 22 January 2026<br>Cabinet -10 February 2026 |
| **Executive Portfolio:** | Councillor Julie Kerr-Executive Councillor for Parks and Countryside, Waste and Street Scene |
| **Report by:** | Andrew Rogan-Head of Operational Services |
| **Ward(s) affected:** | All Ward(s) |

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**Executive Summary:**

Huntingdonshire District Council (HDC) declared a Climate and Ecological Emergency in 2023, committing to achieve net zero emissions by 2040. The Fleet Renewal and Infrastructure Improvement Strategy will set out the framework for future actions to deliver this goal.

These proposals have been developed in collaboration with the Energy Savings Trust and are designed to align with HDC's Corporate Plan 2023–2028, Climate Strategy, and Building Energy Strategy, whilst meeting the requirements of current national legislation that phases out the sale of new petrol and diesel cars and vans from 2030, and all new non-zero-emission heavy goods vehicles (HGVs) by 2040.

Fleet emissions currently make up around 36% of the Council's total carbon footprint and are a key focus of operational and strategic planning. While the Council's Climate Strategy (adopted in February 2023) commits the organisation to net zero carbon operations by 2040, the need to change fleet and infrastructure is driven not just by climate targets but also by national legislation.

The UK Government has committed to phasing out all exhaust-emitting vehicles by 2040 through a three-stage pathway: 2030 marks the end of purely internal combustion engine (ICE) car and van sales (with some hybrid electric vehicles (HEVs) permitted); 2035 requires all new cars, vans, and heavy goods vehicles (HGVs) under 26 tonnes to be zero-emission; and 2040 mandates zero-emission sales for all new HGVs over 26 tonnes.

While the final choices over exact vehicle specifications will be made at a later date when technology solutions are clearer; adopting this strategy and setting a direction to secure essential power upgrades is necessary to ensure HDC’s continued compliance and operational capability as regulations and vehicle technologies evolve; it will also help us to ensure that our depot facilities are fit for the future.

This strategy provides a structured yet flexible approach to fleet modernisation through phased electrification, aligned with financial, infrastructural, and operational readiness. It directly supports the aims of the Corporate Plan 2023–2028, Climate Strategy, and Building Energy Strategy by contributing to lower carbon emissions and building a sustainable future for Huntingdonshire. The strategy achieves full alignment with the Government's Internal Combustion Engine (ICE) ban whilst building on progress already made through the successful adoption of Hydrotreated Vegetable Oil (HVO) fuel, demonstrating HDC's commitment to proactive and measurable climate action. This measured approach acknowledges changing contexts relating to climate change, political landscapes, and local government reorganisation.

The transition is structured into three flexible phases between 2025 and 2035:

**Phase 1 (2025–2028):**
Focus on securing the essential depot power upgrade and scalable charging infrastructure. Further investments or vehicle replacements are only progressed where supported by a clear business case, maximising adaptability to new technologies and operational needs.

**Phase 2 (2028–2031):**
Accelerate the roll-out of electric and alternative fuel vehicles if justified by strong business cases and supported by approved budgets in the MTFS, in line with the Council’s ongoing fleet replacement programme and the implications of wider legislative changes. Annually review the approach to allow for rapid adoption of emerging solutions and changes in financial or operational context.

**Phase 3 (2031 onward):**
Complete the transition to a fully net zero fleet, making use of the latest advancements where there is a business case. Continue regular reviews to ensure all further investments support best value, service resilience, and environmental leadership.

The phased delivery model provides the Council with exceptional flexibility, allowing vehicle replacements and infrastructure upgrades to be timed and tailored in response to changing market, legislative, political, organisational, or financial factors.
Investment in infrastructure is front loaded, with the need to get all wiring/trunking in place and blanking plates in future charging locations. This will mean chargers can simply be added as vehicles are ordered in line with the programme, rather than all being paid for and installed, and not used for several years. Cost outlines provided in the programme are pessimistic, assuming highest likely costs for each installation.

Importantly, investment in electrical infrastructure represents enduring asset value beyond the immediate fleet programme. The grid upgrade and modular charging systems will permanently enhance the Eastfield House Depot and its capacity, ensuring that the capital infrastructure works remain of significant value regardless of any future operational changes or partnership outcomes associated with the Local Government Reorganisation (LGR). It will also provide options to support partner organisations within the wider public sector; and will contribute to maintaining value in the depot as an asset to the Council.

Even if depot operations evolve under a new organisational structure, upgraded power, site-wide cable routing, and EV infrastructure will strengthen operational resilience, support shared service use, and increase the site's overall asset value. The investment is both sensible and future-focused, addressing current service requirements while enhancing the site's long-term operational and property value.

**Recommendation(s)**

Cabinet is asked to:

i. Adopt the Fleet Decarbonisation Strategy as the strategic approach to transition the Councils fleet to net zero emissions in response to the Council's Climate Strategy commitments and the UK Government's confirmed phasing out of new petrol and diesel vehicle sales (2030) and non-zero-emission HGVs (2040), ensuring alignment with the Corporate Plan 2023–2028, Climate Strategy, and Building Energy Strategy.

ii. Approve the phased delivery model and implementation plan (2025–2035) as set out in the HDC Fleet Programme Report (Appendix 1), including:

- Phase 1 (2025–2028): Grid upgrade to 800–850kVA and modular charging infrastructure.

- Phase 2 (2028–2031): Accelerated vehicle roll-out aligned with business case viability.

- Phase 3 (2031 onwards): Completion of full fleet transition to zero-emission vehicles to deliver a modern, resilient, and cost-effective low-carbon fleet.

iii. Approve the enabling infrastructure capital investment of approximately £600,000 for depot grid upgrade, trunking and cable installation; and the incorporation of this figure for budget setting for the MTFS from 26/27; noting that this investment represents a long-term enhancement to Council assets regardless of future service arrangements including Local Government Reorganisation (LGR); .

iv. Note that vehicle capital expenditure over the programme period (2025–2035) will be managed through the Council's existing fleet replacement programme and standard budget-setting cycles, with individual business cases approved annually by the Corporate Director of Finance (Section 151) Officer and Corporate Director for Place in accordance with the established Medium-Term Financial Strategy (MTFS) financial governance process.

v. Delegate authority to the Corporate Director for Place, in consultation with the relevant portfolio holder(s), to explore and develop commercially viable opportunities linked to depot infrastructure, fleet operations, or renewable energy generation that support long-term financial sustainability.

## 1. PURPOSE OF THE REPORT

1.1 This report seeks Cabinet approval to adopt the Fleet Renewal and Infrastructure Improvement Strategy, aligning with the Corporate Plan 2023–2028, Climate Strategy and Building Energy Strategy. The strategy responds to the Council's net zero commitment by 2040 and the UK Government's vehicle phase-out requirements (petrol and diesel cars and vans by 2030; non-zero-emission HGVs by 2040). With fleet emissions representing 36% of the Council's carbon footprint, this transition is essential to achieving net zero targets.

1.2 The report presents a phased delivery model (2025–2035): grid upgrades and charging infrastructure (2025–2028), accelerated vehicle roll-out (2028–2031), and full fleet transition from 2031 onwards. Approval is sought for approximately £600,000 in infrastructure capital investment and delegation of authority to explore commercially viable opportunities linked to depot infrastructure or fleet operation to support long-term financial sustainability. Vehicle capital expenditure will be managed through existing fleet replacement programmes with annual business case approvals.

## 2. BACKGROUND

2.1 Huntingdonshire District Council has committed to achieving net zero carbon emissions by 2040 following recognition of a Climate and Ecological Emergency and the adoption of a Climate Strategy in February 2023 and the Building Energy Strategy (2025).

2.2 Furthermore, the UK Government has committed to phasing out all exhaust-emitting vehicles by 2040 through a three-stage pathway: 2030 marks the end of purely internal combustion engine (ICE) car and van sales (with some hybrid electric vehicles (HEVs) permitted); 2035 requires all new cars, vans, and heavy goods vehicles (HGVs) under 26 tonnes to be zero-emission; and 2040 mandates zero-emission sales for all new HGVs over 26 tonnes.

2.3 Irrespective of climate targets, taking timely action to secure essential power upgrades through this strategy is necessary to ensure HDC's ongoing operational compliance and adaptability as vehicle technologies and regulatory requirements evolve.

2.4 With fleet emissions accounting for approximately 36% of the Council's total carbon footprint, fleet decarbonisation is the organisation's highest climate priority. This strategy offers a clear, phased pathway to decarbonise the operational fleet aligned with the Corporate Plan 2023–2028 objectives, the Councils Building Energy Strategy and ongoing Climate Action Plan.

2.5 The phased delivery model provides the Council with exceptional flexibility, allowing vehicle replacements and infrastructure upgrades to be timed and tailored in response to changing market, legislative, political, organisational, or financial factors.

2.6 Investment in infrastructure is front loaded, with the need to get all wiring/trunking in place and blanking plates in future charging locations. This will mean chargers can simply be added as vehicles are ordered in line with the programme, rather than all being paid for and installed, and not used for several years.

2.7 This approach means the Council can continually optimise its decarbonisation journey and quickly take advantage of new technologies—such as developments in hydrogen or alternative fuels—without being locked into rigid solutions or incurring unnecessary long-term financial commitments.

2.8 The main priority within this strategy is to secure the critical electricity infrastructure upgrade; and provide initial, scalable infrastructure (such as ducting) even if not formally connected or brought in to use initially. Specifically, raising the depot's grid capacity from its current 100KVA to around 850kVA and delivering the necessary cabling infrastructure are essential foundational steps. Total capital cost for the power upgrade is around £200k with cabling infrastructure estimated to be a further £400k. These costs are only likely to increase in future, particularly if capacity is absorbed by other developments coming on stream.

2.9 Without this, the larger scale roll-out of electric and other alternative net zero vehicles becomes more complex and financially risky. It also limits the future potential of the depot in relation to transformation, or expansion should it be necessary.

2.10 The grid connection needs to be upgraded to around 800-850kVA as soon as possible to allow for the transition to take place in line with the programme.

2.11 Infrastructure installation is designed to be modular and scalable, with wiring and trunking installed early and charging units added progressively in line with vehicle delivery.

2.12 Charging units are based around 7.4kw and 22kw standard AC charging units. Vehicle to grid (V2G) charging was considered in the strategy, however, V2G is only suitable where you have capacity in the supply already, along with flexibility in charging times, where an 8 hour window is more than sufficient to top up a battery.

2.13 Building additional capacity into a new system would result in cost prohibitive pay back periods. As HDC vehicles require charging during peak times (12:30 to 00:00), and start operations at 06:00 in the morning, this leaves a reduced window to charge of 6 hours, which is the “off-peak” charging window. Off peak is the only opportunity to buy at a reduced rate, running from 00:00 to 08:00.

2.14 Reducing the charging window from 14 hours to 6 hours, will mean an upgrade of the supply from 850kva to 1800kva, and an upgrade to the speed of every charger to enable charging in a shorter window which is not cost effective. Furthermore, frequent fast charging can also accelerate battery degradation, mainly due to increased heat and faster chemical reactions inside the battery, which can cause loss of charge capacity over time.

2.15 All equipment will be ‘smart’ even if the load balancing system is not strictly needed in the earlier stages of the transition.

2.16 Huntingdonshire District Council’s fleet replacement programme is based on best practice for asset management, ensuring vehicles are replaced at the point where maintenance, reliability, and operational needs justify investment. This programme is reviewed annually, considering the age, mileage, condition of fleet assets, and developing service requirements.

2.17 Capital expenditure for fleet renewals is approved through the Council’s established budget-setting process. Business cases for each replacement, including alternative-fuel and net zero vehicles, are considered alongside all other capital priorities. The Deputy Chief Executive and Corporate Director (Place), Corporate Director (Finance and Resources) Section 151 Officer and Cabinet play key roles in ensuring capital proposals are aligned with the Council’s strategic and financial objectives.

2.18 This approach is deliberately flexible. Replacement cycles are not treated as inflexible or automatic. Instead, vehicles are procured or their lives extended based on changing operational needs, advances in alternative technology, and the annual financial context.

2.19 This flexibility enables the Council to adopt new, low-carbon vehicle technologies—such as electric, hydrogen, or other fuels—on a year-by-year basis, integrating these options when they offer best value or lowest environmental impact. We have also demonstrated, through the HVO trial and roll out, the ability to pilot and test new technologies; undertake evaluation; and then make decisions based on clear business case reasons.

2.20 This strategy will mean the Council is not committed to a fixed, long-term structure of replacements tied to outdated specifications or locked-in capital costs. Annual reviews and business-case approvals help minimise stranded investment, maximise use of emerging technologies, and achieve the best blend of financial sustainability, operational performance, and environmental leadership for the district.

2.21 The flexible roll-out built into this strategy allows the Council to adapt procurement as cleaner manufacturing processes and improved battery technologies become mainstream. While the “embedded carbon” in current electric and hydrogen vehicles—especially from battery production—remains a valid concern, it is expected to fall rapidly as the UK grid decarbonises, battery recycling progresses, and manufacturers shift to lower-carbon materials and processes.

2.22 Environmental impact at end-of-life is another common concern, however rapid progress is being made in battery recycling, re-use, and regulation.

2.23 The UK is actively investing in advanced recycling processes, with new plants able to recover critical metals such as lithium, cobalt, and nickel. The Waste Batteries and Accumulators Regulations 2009 ban the disposal of all waste batteries (including lithium, industrial, automotive, and portable batteries) by landfill or incineration, ensuring responsible disposal.

2.24 The phased, modular approach means HDC’s future vehicle cycles can select newer battery chemistries—such as solid-state or cobalt-free options—as they become commercially viable, further minimising environmental impact and supporting a robust circular economy for vehicle batteries.

2.25 By delivering fleet replacements in stages, the Council can incorporate the latest evidence and technology developments on safety as the market evolves. Though some concerns have been raised about EV fire risk, the most recent UK data demonstrates that fully electric vehicles are much less likely to experience fire than their petrol or diesel counterparts—by as much as twenty times.

2.26 Hybrids are currently more susceptible due to complex systems, but ongoing advances in battery design, fire management technology, and safety regulations are improving outcomes every year.

2.27 The flexible procurement model guarantees that any up-to-date fire safety standards and market innovations can be built into future phases of the decarbonisation programme.

2.28 At every stage, this approach provides flexibility, value for money, and the ability to take advantage of new technologies or market changes—only progressing or investing further, where justified by a sound business case. The key to all of this is ensuring that we have adequate infrastructure available to support solutions when they are viable, and enable us to respond quickly, and in an agile and proportionate manner. It is recommended that investment now will allow this infrastructure to be provided in a cost-effective and practical way, that will balance the investment cost, payback, potential use and wider considerations such as added value to Eastfield House.

## 3. OPTIONS CONSIDERED

3.1 **Do Nothing**- With the UK's internal combustion engine (ICE) ban set to start in 2030, continuing solely with HVO risks escalating costs and threatens future fleet viability. From 2030, new HVO-compatible vehicles cannot be purchased, limiting HVO's use to existing assets. Delaying action also raises the risk that essential depot power upgrades may become unattainable if growing local demand secures grid capacity first. This approach exposes HDC to operational, financial, and regulatory risks as transition options narrow and compliance becomes more expensive.

3.2 **Delay infrastructure upgrade**- Delaying the infrastructure upgrade until after LGR is possible, but doing so makes it much more likely that local development or reallocation of resources will result in the depot losing access to the necessary grid capacity. If other developments secure available power first, the cost and feasibility of upgrading later could be significantly reduced, limiting the council's ability to transition the fleet when needed. The grid connection needs to be upgraded to around 800-850kVA as soon as possible to allow for the transition to take place in line with the programme.

3.3 **Exploring external partnerships**- Shared infrastructure for fleet charging or service delivery may offer economies of scale and flexibility, but it introduces long-term risks—especially as organisational priorities, boundaries, or funding arrangements shift during or after Local Government Reorganisation. Changes in governance or priorities can destabilise shared service agreements, disrupt access to depot infrastructure. Over time, evolving partner needs may reduce the control and strategic alignment, impacting costs, operational resilience, and service quality if arrangements no longer fit the either partners requirements.

## 4. COMMENTS OF OVERVIEW & SCRUTINY

4.1 The Overview and Scrutiny (Environment, Communities and Partnerships) Panel discussed the report at its meeting on 22nd January 2026.

4.2 It was clarified to the Panel that the electric freighters were heavier than the vehicles currently used. Concern was expressed about the carbon footprint generated during the production of the vehicles, following which, the Panel heard that this concern was recognised and in addition, noted that Germany had introduced some flexibility into their proposal to ban internal combustion engines by 2035. It was further noted that with flexibility in the strategy the main focus would be to secure power onto the site as this would form the basic structure going forward.

4.3 The Panel heard that the business continuity plans would be updated as technology was updated and in line with the required power provision at Eastfield House. It was also noted that the flexibility of the report and strategy allowed for further development of emerging technologies and the associated operational delivery and for the Council to react accordingly.

4.4 Councillor Shaw reflected that the report had previously been seen and discussed by the Climate Working Group and that he was generally in favour of the Strategy however he did express concerns relating to the optimism surrounding the responsible disposal of lithium batteries. The Panel heard that modelling on typical mileage per kilowatt hour of the vehicles had been undertaken through the Energy Saving Trust and using existing round data whilst also accommodating the anticipated expansion to rounds encompassing new homes under construction. It was confirmed that an anticipated maximum of 850kVs would be required to charged all vehicles from flat to a full charge and that further work had been done to calculate smart charging to bring vehicles of different charge levels to a balanced charge then complete all vehicles to full charge.

4.5 It was noted that the grounds team at St Neots Town Council had acquired an electric lawn mower and that the reduction in noise and fumes experienced by operatives had been well received. This was a sentiment shared by the Council's Operations Team who have been trialling new technologies in order to make informed judgement on their use. It was also noted that smaller, urban authorities were able to make good use of these technologies however significant challenges were posed by the size and rural nature of the district. It was further observed that electrical vehicles tended to have cheaper maintenance costs due to less moving parts however investment would be required to enable the workshop to accommodate parts and training of operatives to service the new technologies.

4.6 The Panel were advised that the DVSA would accommodate and account for the weight of the battery on each vehicle in such a way so as not to loose the capacity of the vehicle and that it's payload would not be reduced. It was also advised that the team had previously loaned a vehicle from a neighbouring authority which had performed well but more information was being sought on performance in extreme temperatures and weathers and that a cautious approach was being taken.

4.7 It was observed that a cautious approach would be prudent as there were concerns about the infrastructure required for the new technology to function and it was acknowledged that this was imperative. It was also advised that research was being undertaken on optimum battery conditions and charging to ensure full life expectancy from the technology.

4.8 Following the discussion, the Panel were informed that their comments would be added to the Cabinet report in order for an informed decision to be made on the report recommendations.

## 5. KEY IMPACTS / RISKS

5.1 The national ban on new petrol and diesel vehicles from 2030 (and on new non-zero-emission HGVs up to and including 26 tonnes from 2035 and all HGVs over 26 tonnes from 2040) requires a proactive and timely transition strategy; delaying action risks non-compliance, stranded assets, and service disruption as older fleet options are phased out.

5.2 Delaying grid and charging infrastructure upgrades as development progresses could make future electrification more costly or infeasible, potentially leaving the Council unable to deliver zero-carbon fleet operations or respond when a business case is established.

5.3 A phased approach is essential as rapid advances in vehicle and charging technology, as well as the unpredictable impact of Local Government Reorganisation, mean flexibility is needed to adapt to changing operational landscapes, emerging solutions, and organisational priorities.

## 6. TIMETABLE FOR IMPLEMENTATION

6.1 2025/26 a formal application to UK Power Network will be initiated for the power to be upgrade to 850KVA at the Eastfield House Depot.

6.2 This upgrade is expected to be completed within 12 months (late 2026, to early 2027)

6.3 Civil works for cabling and trunking should take approx. 3 months to complete and is estimated to be completed by mid-2027.

6.4 All vehicle replacements submitted in August each year through the standard capital budget cycle.

## 7. LINK TO HUNTINGDONSHIRE FUTURES, THE CORPORATE PLAN, STRATEGIC PRIORITIES AND/OR CORPORATE OBJECTIVES

*(See Corporate Plan)(See Huntingdonshire Futures)*

7.1 Climate Strategy
7.2 Building Energy Strategy Cabinet Report - September 2025
7.3 Place Strategy
7.4 Corporate Plan

## 8. CONSULTATION

8.1 This Strategy has been completed in collaboration with the Energy Savings Trust.

8.2 The strategy has been reviewed through the Environmental task and finish group with positive feedback given.

## 9. LEGAL IMPLICATIONS

9.1 The UK Government's national legislation will prohibit the sale of new petrol and diesel cars and vans by 2030, and new non-zero-emission heavy goods vehicles (HGVs) by 2040, making it illegal to procure or expand the fleet with these vehicles beyond those deadlines.

9.2 Ongoing compliance with air quality and emissions regulations (including Clean Air Zones and non-road mobile machinery standards) will increasingly require adoption of zero-emission vehicles, meaning retention of older diesel vehicles may breach local or national air quality directives as enforcement tightens.

## 10. RESOURCE IMPLICATIONS

10.1 Fleet and Depot Management/Operational Services: Largest impact, as this service will oversee procurement of new vehicles, coordinate replacement scheduling, manage asset disposal, and implement all day-to-day fleet operations related to charging and vehicle use.

10.2 Facilities/Infrastructure: Responsible for planning, executing, and maintaining the grid connection upgrades, charging infrastructure, cable routing, and depot modifications necessary for electrification—including any site expansion or civil works required.

10.3 Procurement: Involved in all vehicles, charger, and infrastructure acquisitions; ensures compliance with council and public procurement standards.

10.4 ICT/Digital Services: Required for the integration and management of smart charging system and software platforms to optimise vehicle and energy use.

10.5 Workshop: The workshop will need to evolve in terms of skills, knowledge and infrastructure as servicing and maintenance of zero-emissions vehicle become mainstream. This has potential benefits as we upskill and improve the workshop, and may allow us to accommodate other public sector bodies vehicles, much as we do now.

10.6 Legal/Governance: Will review contracts, funding conditions, legal compliance with evolving regulation (including the ICE ban and relevant safety/building legislation), and governance arrangements of new asset management models or partnerships.

## 11. HEALTH IMPLICATIONS

11.1 Lower noise pollution from electric vehicles during rounds and depot movements, supporting better physical and mental health for residents, crew, and depot staff.

11.2 Long-term public health gains as part of the Council's commitment to cleaner, quieter, more sustainable frontline services, supporting broader climate and health strategy outcomes.

## 12. ENVIRONMENT AND CLIMATE CHANGE IMPLICATIONS

12.1 Major reductions in greenhouse gas (GHG) emissions, with HDC's transition projected to cut fleet $CO_2$ emissions by more than 1,300 tonnes annually by 2040, supporting both local and national net zero targets.

12.2 Significant improvement in local air quality through major reductions in tailpipe emissions of nitrogen oxides (NOx), particulate matter (PM), and other pollutants compared to diesel vehicles, benefiting both staff and the wider public—especially in urban collection zones.

12.3 Lower noise pollution from electric vehicles during rounds and depot movements, supporting better physical and mental health for residents, crew, and depot staff.

12.4 Long-term infrastructure investments such as smart grid connections and modular charging will provide environmental resilience, supporting adaptation and minimising future disruption as technology and service needs evolve

## 13. REASONS FOR THE RECOMMENDED DECISIONS

13.1 The recommendation of approving the Fleet Renewal and Infrastructure Improvement Strategy is essential for HDC to meet strict national legislation on petrol and diesel vehicle sales and ensure ongoing operational reliability and ensuring long-term service resilience. Critically, the fleet decarbonisation programme supports the Council's net zero target by 2040, cutting carbon and improving local air quality, with clear co-benefits for community health and environment. Early action minimises compliance risks and demonstrates strong local leadership in sustainability.

## 14. LIST OF APPENDICES INCLUDED

Appendix 1 – Fleet Renewal and Infrastructure Programme

**Further Reading**
**Government Consultation on Phasing out New Petrol and Diesel Car Sales**

**Government Transition to Zero Emission Cars and Vans**

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energy saving trust

# Fleet Renewal and Infrastructure Programme

Huntingdonshire District Council

By James Brown

Peer reviewed by Callum Puttock

# Contents



## 15. EXECUTIVE SUMMARY

Huntingdonshire District Council (HDC) formally recognised a 'Climate Crisis and Ecological emergency' in February 2023. A climate strategy has been adopted, which specifies the need for a zero-emission fleet by 2040. This document is a follow up to the initial fleet review, that reflects the changing (improving) electric vehicle (EV) market and outlines a programme for transition to zero emission reflecting capital costs, running cost savings and infrastructure needs, adjusted for the future fleet that includes food waste collections.

### Key findings and opportunities

- The availability and costs of electric vehicles has improved significantly since the initial fleet review was undertaken. Most notably, the cost of an electric refuse collection vehicle (eRCV) has dropped by over £40,000 and more quality options are available.
- This means that whole life costs (at current prices) favour electric over diesel over a seven-year period by around £3,000 a year (this is a £6,000 saving when compared to using HVO). We expect this saving to continue to increase -**Section 6.**
- Savings could be increased by retaining eRCVs for a longer time period (within battery warranty), even allowing for costs of rig refurbishment – **Section 6.2** and **Figure 6-2**.
- The key limitation for take up at present is the need to upgrade the grid connection at Eastfield House. However, this is possible and could be completed within 7 to 15 months for circa £200,000, depending on progress alongside UK Power Networks - **Section 9.**
- The grid connection needs to be upgraded to around 800-850kVA as soon as possible to allow for the transition to take place in line with the programme. Only a small number of vehicles can transition to electric before this on a time managed charging basis. HDC still need to buy 3 diesel RCVs and some 4x4s beyond this year's programme -**Table 7-2**.

- Most 3.5t tippers replacements should be deferred until infrastructure is in place to enable a renewed electric fleet. This will also allow clarity on legislation for 4.25t electric vehicles.
- Investment in infrastructure is front loaded, with the need to get all wiring/trunking in place and blanking plates in future charging locations. This will mean chargers can simply be added as vehicles are ordered in line with the programme, rather than all being paid for and installed, and not used for several years. All charging stations need to be either 7kW AC or 22kW AC. Some will require double outlets, as specified in the programme - **Section 9**.
- Load balancing will be needed to ensure all vehicles can be charged at the same time in the latter stages of the programme (Circa 2030/31 onwards). All equipment should be 'smart' and compatible with this, even if the load balancing system is not strictly needed in the earlier stages of the transition - **Section 9.2**.
- Cost outlines provided in the programme are pessimistic, assuming highest likely costs for each installation. We fully expect detailed planning to deliver significant reductions and have provided a calculation template in this document to help ensure quotes received are in line with industry guidance - **Figure 9-1**.
- **Table 1-1** is a summary of the programme, and **Figure 1-1** is the broader timeline to work to.
- Detailed vehicle replacement programmes for each year are in **Section 7** and details on infrastructure on **Section 9**
- Limited but significant opportunities may emerge from working with a local energy supplier (**Section 10**) and also from trials of eRCVs (**Section 11**).

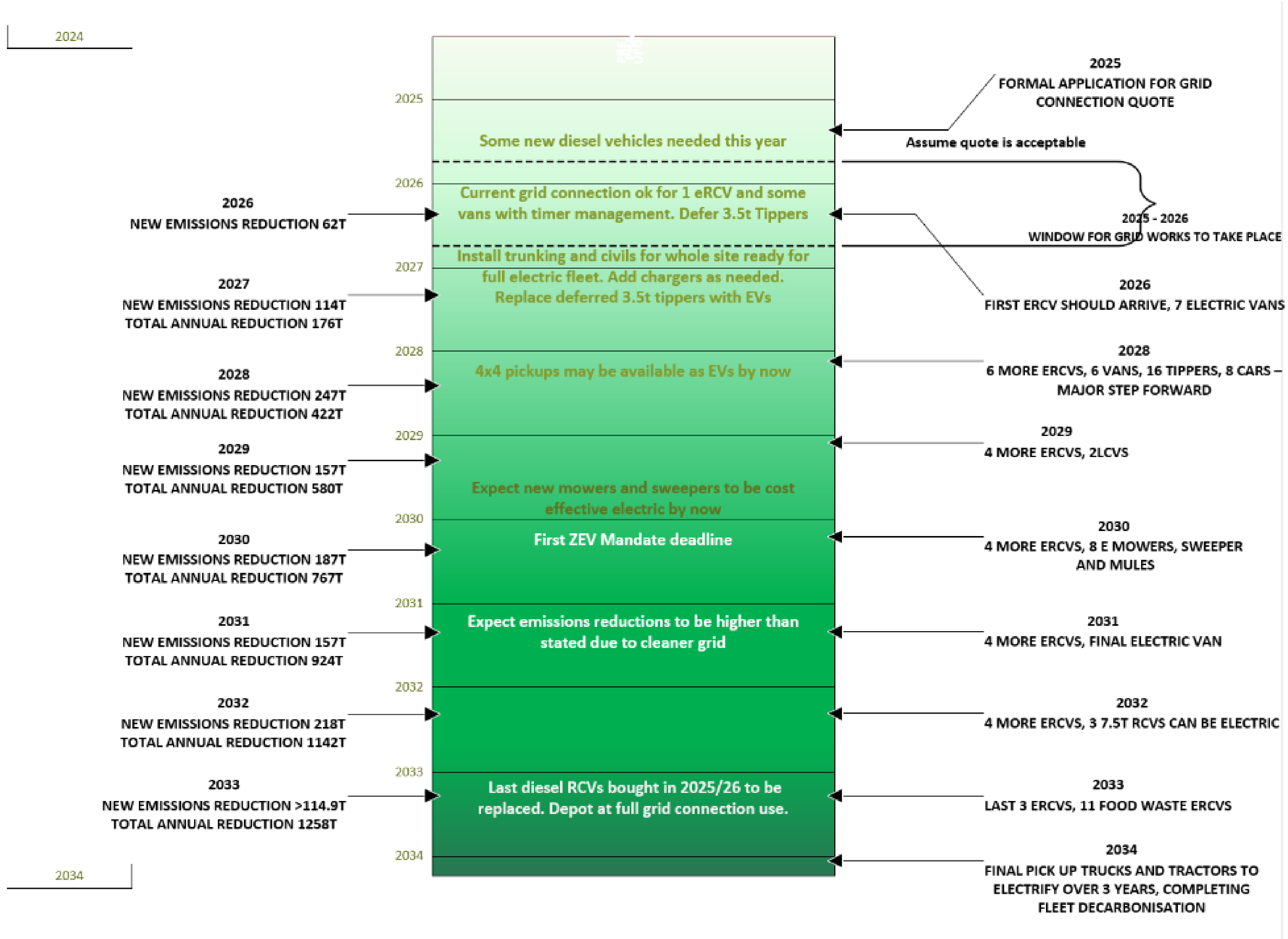
*Table 15-1 – Summary of programme to transition vehicles to EV, with estimated total costs and worst-case infrastructure costs.*

| Programme year | Diesel vehicles needed | Diesel capital costs (ex VAT & Delivery) | First time electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Budget for infrastructure (worst case) | Emissions reductions from new vehicles | Estimated total annual emissions reduction |
|---|---|---|---|---|---|---|---|---|---|
| 2025/26 | 25 | £1,148,400 | 8 | £578,600 | £97,300 | 13 | £275,500 | 62.0t | 62.0t |
| 2026/27 | 2 | £52,700 | 21 | £1000,200 | >£169,400 | 0 | £441,500 | 92.1t | 154.1t |
| 2027/28 | 0 | £150,000 | 14 | £2,239,065 | £401,100 | 0 | £85,000 | 246.7t | 400.8t |
| 2028/29 | 0 | N/A | 6 | £1,402,300 | £251,900 | 0 | £40,000 | 157.2t | 558.0t |
| 2029/30 | 0 | N/A | 17 | £2,045,000 | £283,600 | 0 | £37,500 | 187.4t | 745.4t |
| 2030/31 | 0 | N/A | 5 | £1,377,555 | £250,100 | 0 | £30,000 | 157.3t | 902.7t |
| 2031/32 | 0 | N/A | 7 | £1,773,000 | >£250,000 | 0 | £45,000 | 218.3t | 1121.0t |
| 2032/33 | 0 | N/A | 14 | £3,205,000 | >£187,600 | 0 | £60,000 | >114.9t | 1235.9t |
| 2033/34 | 0 | N/A | 6 | £480,100 | £57,700 | 0 | £32,500 | 38.8t | 1274.7t |
| 2034/35 | 0 | N/A | 2 | £80,000 | Unknown | 0 | N/A | 4.8t | 1279.5t |
| 2035/36 | 0 | N/A | 4 | £414,000 | Unknown | 0 | N/A | 9.8t | 1289.3t |
| 2038/39 | 0 | N/A | 3 | £320,000 | Unknown | 0 | N/A | Unknown | >1,289.3t |

- This is a summary of the replacement programme for all vehicles that have not yet been replaced by EVs. New diesel vehicles that are required are subsequently included again in the programme in later years for electric replacements (therefore are essentially included twice). However, once vehicles are replaced by EVs, subsequent replacements of these are not repeated, to keep this programme focused on decarbonisation and also taking the view that future replacement cycles of EVs will benefit from flexible replacement intervals, given a potentially longer life cycle.
- The programme is set in the context of charging infrastructure that is likely to be available. In some cases this results in suggestions for deferring some vehicle replacements and also results in some new diesel vehicles being required.
- Amounts allocated reflect current 2025 prices and do not factor in inflation. This is best calculated each year as figures are known.
- EV emissions are based on the 2024 grid factor of 125g/$CO_2$ per kWh.

The summary timeline for the programme and key actions, alongside emissions savings is shown in **Figure 1-1**.

***Figure 15-1*** *– HDC fleet decarbonisation timeline – 2025 to 2034*


2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
Some new diesel vehicles needed this year
Current grid connection ok for 1 eRCV and some vans with timer management. Defer 3.5t Tippers
Install trunking and civils for whole site ready for full electric fleet. Add chargers as needed. Replace deferred 3.5t tippers with EVs
4x4 pickups may be available as EVs by now
Expect new mowers and sweepers to be cost effective electric by now
First ZEV Mandate deadline
Expect emissions reductions to be higher than stated due to cleaner grid
Last diesel RCVs bought in 2025/26 to be replaced. Depot at full grid connection use.
2026 NEW EMISSIONS REDUCTION 62T
2027 NEW EMISSIONS REDUCTION 114T TOTAL ANNUAL REDUCTION 176T
2028 NEW EMISSIONS REDUCTION 247T TOTAL ANNUAL REDUCTION 422T
2029 NEW EMISSIONS REDUCTION 157T TOTAL ANNUAL REDUCTION 580T
2030 NEW EMISSIONS REDUCTION 187T TOTAL ANNUAL REDUCTION 767T
2031 NEW EMISSIONS REDUCTION 157T TOTAL ANNUAL REDUCTION 924T
2032 NEW EMISSIONS REDUCTION 218T TOTAL ANNUAL REDUCTION 1142T
2033 NEW EMISSIONS REDUCTION >114.9T TOTAL ANNUAL REDUCTION 1258T
2025 FORMAL APPLICATION FOR GRID CONNECTION QUOTE
Assume quote is acceptable
2025 - 2026 WINDOW FOR GRID WORKS TO TAKE PLACE
2026 FIRST ERCV SHOULD ARRIVE, 7 ELECTRIC VANS
2028 6 MORE ERCVS, 6 VANS, 16 TIPPERS, 8 CARS – MAJOR STEP FORWARD
2029 4 MORE ERCVS, 2LCVS
2030 4 MORE ERCVS, 8 E MOWERS, SWEEPER AND MULES
2031 4 MORE ERCVS, FINAL ELECTRIC VAN
2032 4 MORE ERCVS, 3 7.5T RCVS CAN BE ELECTRIC
2033 LAST 3 ERCVS, 11 FOOD WASTE ERCVS
2034 FINAL PICK UP TRUCKS AND TRACTORS TO ELECTRIFY OVER 3 YEARS, COMPLETING FLEET DECARBONISATION

# 16. SUMMARY OF PHASE 1 - 2025/26 TO 2027/28

***Figure 16-1*** *– Timeline for 2025/26 to 2027/28*

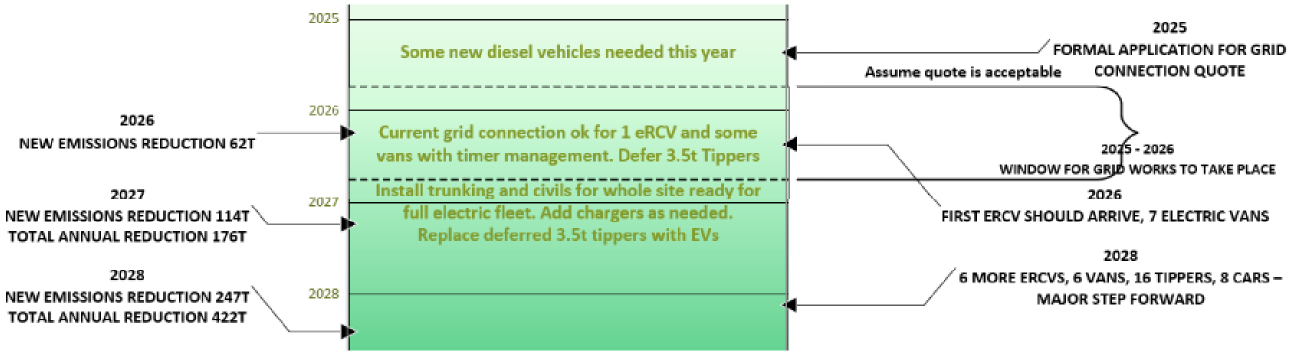



***Table 16-1*** *– Enabling EV infrastructure likely costings 2025/26 to 2027/28*

| Year | Item (s) | Outline cost |
|---|---|---|
| 2025/26 | Grid Upgrade to 800/850kVA | £150,000 |
| | Grid upgrade ancilliaries, items not in DNO quote – such as cabinet base, etc | £50,000 |
| | 1* 22kW and 7*7kW chargers, installed (can be done on current connection with timer) | £75,500 |
| 2026/27 | All trunking, charger locations install ready with blanking plates for fully electric fleet | £324,000^ |
| | Provision for load balancing (maybe possible at a later stage) | TBC |
| | 1*22kW and 22* 7kW charger (subject to 800kVA grid connection) plus final install, etc | £117,500 |
| 2027/28 | 6*22kW chargers and 8*7kW chargers | £85,000 |

*^ Worst case estimate – expect to be much less in practice if efficient trunking arrangement can be made –use **Figure 9-1** to calculate*

***Table 16-2*** *– Vehicle capital likely costings 2025/26 to 2027/28*

| Fleet category/ Year | Diesel vehicles needed | Diesel capital (ex VAT & delivery) | Electric vehicles needed | EV capital (ex VAT & delivery) | Lifetime EV energy cost savings | Est annual emissions reduction |
|---|---|---|---|---|---|---|
| **2025/26 Total** | **25** | **£1,148,400** | **8** | **£578,600** | **£97,300** | **62.0t** |
| 3.5t Van | 0 | N/A | 5 | £199,000 | £30,500 | 20.5t |
| 3.5t Tipper | 5 | £165,000 | 0 | N/A | N/A | Nil |
| Small Van | 0 | N/A | 2 | £44,600 | £4,300 | 3.2t |
| 7.5t-12t | 2 | £165,000 | 0 | N/A | N/A | Nil |
| 26t RCV | 3 | £432,300 | 1 | £335,000 | £62,500 | 38.3t |
| Plant | 15 | £395,100 | 0 | N/A | N/A | Nil |
| **2026/27 Total** | **2** | **£52,700** | **21** | **£1,000,200** | **>£169,400** | **92.1t** |
| 3.5t Tipper | 0 | N/A | 12 | £575,500 | £120,600 | 64.8t |
| Small Van | 0 | N/A | 2 | £44,600 | £6,200 | 3.2t |
| 18t Skip loader | 0 | N/A | 1 | £220,000 | £22,600 | 9.7t |
| Car | 0 | N/A | 8 | £160,100 | >£20,000 | 14.4t |
| 4x4 Pick up | 2 | £52,700 | 0 | N/A | N/A | Nil |
| **2027/28 Total** | **0** | **£150,000** | **14** | **£2,239,065** | **£401,143** | **246.7t** |
| Sweeper | 1 | £150,000 | 0 | N/A | N/A | Nil |
| Small Van | 0 | N/A | 5 | £111,510 | £14,680 | 8t |
| 3.5t Van | 0 | N/A | 1 | £37,555 | £1,363 | 4.1t |
| 26t RCV | 0 | N/A | 6 | £2,010,000 | £375,100 | 229.8t |
| 4x4 Pick up | 0 | N/A | 2 | £80,000 | £10,000 | 4.8t |

## 17. SUMMARY OF PHASE 2 – 2028/29 TO 2030/31

***Figure 17-1*** *– Timeline for 2028/29 to 2030/31*

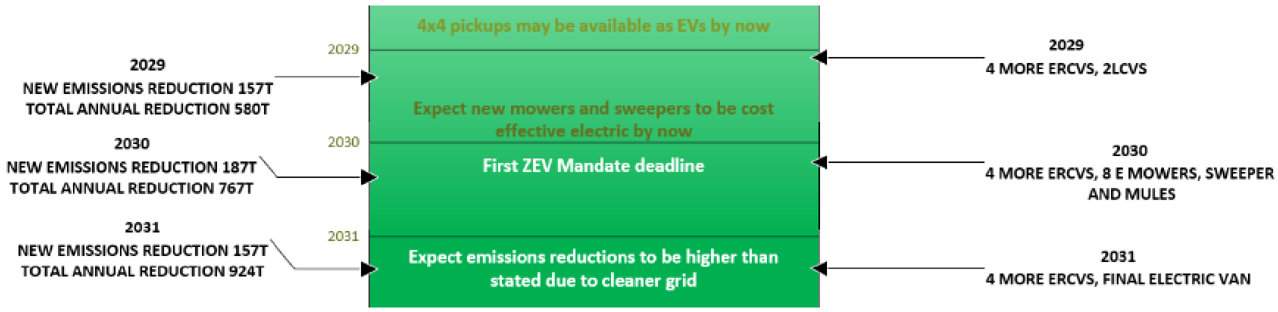



***Table 17-1*** *– Enabling EV infrastructure likely costings 2028/29 to 2030/31*

| Year | Item (s) | Outline cost |
|---|---|---|
| 2028/29 | 4*22kW chargers and 2*7kW chargers | £40,000 |
| 2029/30 | 5*22kW chargers | £37,500 |
| | 12*7kW chargers *May not all be needed if alternate day charging is achieved and proven effective in for low use vehicles* | *zero to £60,000 |
| 2030/31 | 4*22kW chargers | £30,000 |
| | 1*7kW chargers *May not be needed if alternate day charging is achieved and proven effective in for low use vehicles* | £5,000* or zero |

***Table 17-2*** *– Vehicle capital likely costings 2028/29 to 2030/31*

| Fleet category/ Year | Diesel vehicles needed | Diesel capital (ex VAT & delivery) | Electric vehicles needed | EV capital (ex VAT & delivery) | Lifetime EV energy cost savings | Est annual emissions reduction |
|---|---|---|---|---|---|---|
| **2028/29 Total** | **0** | **N/A** | **6** | **£1,402,300** | **£251,900** | **157.2t** |
| Small Van | 0 | N/A | 1 | £22,300 | N/A | 1.6t |
| 26t RCV | 0 | N/A | 4 | £1,340,000 | £250,100 | 153.2t |
| 4x4 Pick up | 0 | N/A | 1 | £40,000 | £1,800 | 2.4t |
| **2029/30 Total** | **0** | **N/A** | **17** | **£2,045,000** | **£283,600** | **187.4t** |
| Mower | 0 | N/A | 8 | £400,000 | Est £20,000 | 22.4t |
| Tractor/Mule | 0 | N/A | 4 | £80,000 | Est £5,000 | Unknown |
| Sweeper | 0 | N/A | 1 | £225,000 | £8,500 | 11.8t |
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 153.2t |
| **2030/31 Total** | **0** | **N/A** | **5** | **£1,377,555** | **£250,100** | **157.3t** |
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 153.2t |
| 3.5t Van | 0 | N/A | 1 | £37,555 | N/A | 4.1t |

## 18. SUMMARY OF PHASE 3 – 2031/32 ONWARD

***Figure 18-1*** *– Timeline for 2031/32 onwards*

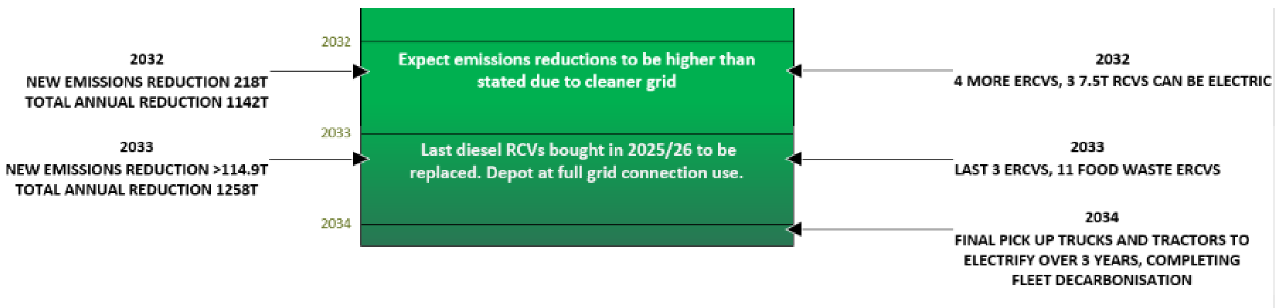


***Table 18-1** – Enabling EV infrastructure likely costings 2031/32 onwards*

| Year | Item (s) | Outline cost |
|---|---|---|
| 2032/33 | 3*22kW Charger | £22,500 |
| | 5*22kW Charger with 2 outlets (10*11kW) | £37,500 |
| 2033/34 | 1*22kW Charger | £7,500 |
| | 5*7kW Chargers | £25,000 |
| Beyond | A further 7 vehicles will require 7kW charging, although this may well be achievable through sharing of existing outlets. | Up to £35,000 – may be zero. |

***Table 18-2** – Vehicle capital likely costings 2031/32 onward*

| Fleet category/ Year | Diesel vehicles needed | Diesel capital (ex VAT & delivery) | Electric vehicles needed | EV capital (ex VAT & delivery) | Lifetime EV energy cost savings | Est annual emissions reduction |
|---|---|---|---|---|---|---|
| **2031/32 Total** | **0** | **N/A** | **7** | **£1,773,000** | **>£250,100** | **218.3t** |
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 153.2t |
| RCV 7.5t | 0 | N/A | 2 | £340,000 | Unknown | 43.2t |
| Tipper 7.2t | 0 | N/A | 1 | £93,000 | Unknown | 21.9t |
| **2032/33 Total** | **0** | **N/A** | **14** | **£3,205,000** | **>£187,600** | **>114.9t** |
| RCV 26t | 0 | N/A | 3 | £1,005,000 | £187,600 | 114.9t |
| Food Waste 12t | 0 | N/A | 11 | £2,200,000 | Unknown | Unknown |
| **2033/34 Total** | **0** | **N/A** | **6** | **£480,100** | **£66,200** | **38.8t** |
| 3.5t Tipper | 0 | N/A | 5 | £255,100 | £57,700 | 27t |
| Sweeper | 0 | N/A | 1 | £225,000 | £8,500 | 11.8t |
| **2034/35 Total** | **0** | **N/A** | **2** | **£80,000** | **Unknown** | **4.8t** |
| 4x4 Pickup | 0 | N/A | 2 | £80,000 | Unknown | 4.8t |
| **2035/36 Total** | **0** | **N/A** | **5** | **£414,000** | **Unknown** | **>4.8t** |
| 4x4 Pickup | 0 | N/A | 2 | £80,000 | Unknown | 4.8t |
| Tractor | 0 | N/A | 1 | £100,000 | Unknown | Unknown |
| 7.5t Box & Tipper | 0 | N/A | 2 | £234,000 | Unknown | Unknown |
| **2038/39 Total** | **0** | **N/A** | **3** | **£320,000** | **Unknown** | **Unknown** |
| Tractor | 0 | N/A | 3 | £320,000 | Unknown | Unknown |

## 19. UPDATED EHGV COSTS AND VIABILITY

### 7.5t HGVs

Mercedes, through its Fuso subsidiary, has the 7.5-tonne eCanter which is now in full production. The specification offers three battery options with gross weights ranging from 6.5t to 8.5t, providing from 40kWh to 120kWh battery capacity, with the latter claiming a likely 120-mile range from mixed use (the smaller battery would be closer to 40 miles). However, the larger battery model is likely to require a C category driving licence and will be restricted from roads where there is a 7.5t weight limit.

There is currently a payload impact from transitioning to battery electric 7.5t HGVs. It appears likely that a 12t electric HGV will be presented as the alternative to 7.5t diesel vehicles by some manufacturers, where operations are payload critical.

HDC has recently replaced three of the vehicles in this size category with new Diesel vehicles and is in the process of buying the remaining two to replace some of the oldest vehicles on the fleet. As such we would expect this replacement to occur in the middle of the 2030's when the cost and product offer will be transformed from what is available today. This is included in the replacement programme as 'replacement of replacements' based on current quoted EV prices.

### 18t HGV

There are now many electric HGVs on the market. Most can be specified with different types of body, suited to many different operations.
At the end of 2022 the UKs [first electric skip loader started work with Recycling Lives in Preston, Lancashire.]


This is an 18t Renault E-Tech D Wide 4x2 BEV truck. It has a 265kWh battery and Renault's own modelling suggests that carrying a 50% load it could achieve a range of 200-210 km (124 to 130 miles) with external temperatures at five degrees. This would be based on an estimated 200kWh useable capacity. A 360kWh option is available (same size and weight), giving 300kWh useable capacity and substantially more range. However, if less range is needed, costs can be saved through fewer battery packs.
The Mercedes e-Actros website indicates an 18t vehicle is available with a 336 kWh battery, giving a potential range of around 250km (150 miles) in similar circumstances.
The BEV skip loaders typically have an extra one-tonne weight allowance (so an 18t truck would be replaced by a 19t BEV which is taxed and classed the same as an 18t vehicle giving a competitive payload).
HDC only operate one 18t skip loader, LN65UVB. No telematics data is available for this vehicle and refuelling does not take place every day, so daily miles are not visible. Annual mileage was 7,452 in 2022/23, at an average efficiency of 8.8mpg. This would equate to an average of 31 miles a day based on 240 working days, which is well within the range of a single 94kWh battery pack (which would provide over a 50-mile single charging range). However, it is not clear if the vehicle has worked for 240 days or how much the daily usage varies. This means that HDC would need to identify peak daily usage, before being able to specify the most cost-effective battery configuration or have confidence that a BEV could undertake all the existing duties of this vehicle without the need for potentially disruptive in-shift top up charges. We would suggest that at least a 188kWh battery would be needed (giving around 100-mile range). A larger battery would mean less frequent charging would be needed.

### 18t WLC comparison

Many eHGVs are being offered with an eight-year battery guarantee which also equates to around 300,000 miles. This would suggest that an 18t skip loader employed by HDC would operate reliably at 10-years old, and likely beyond.

Based on charging point availability this vehicle's scheduled replacement with electric would need to be deferred from 2025/26 to ensure that there was sufficient charging infrastructure. Alternatively, if a new diesel vehicle is purchased, it will not be due for replacement until at least 2032/33. If deferring is not possible, a used diesel replacement could shorten the lead time for the shift to electric but would come with its own maintenance risks.

We have compared basic costs for vehicles in this class, based on 8,000 miles a year over 10 years and using the current average of 8.8 mpg for this vehicle.

BEV and diesel vehicle purchase costs are based on a quote from the manufacturer for a chassis cab, with extra allowance for the skip-loading body. The assumption is that the BEV would be recharged overnight at an average £0.19 / kWh. We also present the situation if HVO is used as an alternative to diesel, at a price premium of £0.16 a litre. It is worth noting that slightly more HVO is needed due to its lower calorific value than standard diesel.

Whilst maintenance is typically cheaper for a BEV, we have no detailed comparative figures, so have estimated the cost to be 80% of the diesel vehicle due to fewer service parts.

***Table 19-1*** *Estimated annual costs based on WLC for replacement of 18t skip-loader, 10 years, 8,000 miles a year*

| | Renault Trucks 19t (188 kWh) | Renault Trucks 18t (Diesel) | Renault Trucks 18t (using HVO) | Comments |
|---|---|---|---|---|
| Estimated purchase price | £200,000 | £90,000 | £90,000 | |
| Grant | (£25,000) | n/a | n/a | Assumes some RCVs will receive higher rate. |
| Battery residual value | (£18,000) | n/a | n/a | |
| Chassis residual value | (£9,000) | (£9,000) | (£9,000) | BEV RV with battery |
| Total estimated SMR cost | £32,640 | £40,800 | £40,800 | £0.51/mile for diesel, BEV at 80% of this cost |
| Vehicle road fund licence / levy | £4,660 | £4,660 | £4,660 | Assume BEV RFL and Levy from 2025 |
| Estimated energy cost | £35,500 | £50,006 | £59,597 | Electricity £0.19 a kWh, diesel £1.21 exc VAT a litre, HVO plus £0.16 |
| AdBlue cost | n/a | £1,084 | £1,141 | £0.75 a litre, 3.5% of diesel volume |
| Total annual cost | £22,080 | £17,755 | £18,720 | |
| Cost per mile | £2.76 | £2.22 | £2.34 | |
| Annual $CO_2$e emissions | 1.6 t | 13.1 t | 1.7 t* | Based on 2024 emissions factors – BEV figures will drop each year |

**ignores 'out of scope emissions', which still occur.*

A shift to BEVs is very likely to be operationally viable in this sector and will deliver an emissions reduction of at least 11.5t $CO_2$e a year for a BEV when compared to a diesel equivalent. This reduction could increase if any of the energy was generated from the on-site solar installation. This reduction will increase each year as the national grid continues to decarbonise.

There are currently increased costs in replacing the 18t HGVs with a BEV of around £4,300 a year based on current energy costs and the relatively low annual mileage undertaken. This reduces to around £3,400 a year if compared to HVO.

Whilst using HVO in diesel vehicles delivers a significant 'reportable' reduction in emissions, this is at a significant financial cost over diesel and may or may not reflect an actual reduction in terms of overall climate change impact because of the potential for indirect land use change and the liberal classification of used cooking oil (usually the primary feedstock for HVO) as waste.

Using a BEV with grid electricity at current prices means that each tonne of $CO_2$ emissions saved costs around £375 to achieve, which is more than the carbon price of £250 discussed in the previous review. Using eHGVs will be quieter and will improve air quality, so HDC would have to 'weigh up' the benefits of the additional expenditure in this category.

## 20. UPDATED ERCV COSTS AND VIABILITY

### Update on battery electric refuse collection vehicles

One of the best-selling electric refuse collection vehicles (eRCV) in the UK has been the Dennis Eagle eCollect, with over 100 sold. The specification has not changed for over three

years (it is still offered with a 270kWh battery) with a narrow body and a top speed of around 40mph. Whilst many users have reported good performance, some have faced challenges on hilly terrain and the nature of charging infrastructure required is proving to be focused around only one provider's option. This vehicle is priced at £460,000.
Another vehicle with many examples in circulation is the Electra eRCV based on a Mercedes Econic chassis. This vehicle specification has been more dynamic with increasing battery sizes and some technical improvements. However, users we have spoken to have reported varying levels of reliability. Prices were typically slightly below the Dennis Eagle product for equivalent specification.
The Lunaz eRCV has been withdrawn from the market with the closure of that company.
Other OEMs have now entered well developed products into the market based on existing diesel chassis. Mercedes have started to sell its own Econic eRCV with a choice of battery sizes which has so far received excellent feedback. A Volvo eRCV was recently purchased by Wiltshire Council for a reported £323,000. Whilst battery size and body and bin lift specification was not reported, it appears that this is most likely to be the 376kWh variant. Similarly, Volvo's sister company' Renault Trucks have provided a quote for a 376kWh base vehicle ready to install the RCV body at £245,000. With a generous £90,000 allowance for a body build and electric bin lift, this equates to around £335,000. Reports on usage of all three OEM vehicles have been very positive to date.

### Updated whole life costing model for electrification of RCVs

HDC's 28 26t RCVs are usually replaced at a rate of four per year. A previous fleet review noted average efficiency at 4.35mpg, with a 14,400 average annual mileage and emissions of 48t of GHG per vehicle.
Based on the assumption that an eRCV uses 30% of the energy of a diesel RCV, past analysis concluded that a 300kWh useable battery capacity would suffice every day for 17 of the RCVs and a further seven would only exceed this once or twice a year, with mitigation possible from a depot based top up charge within the normal duty cycle. Two more vehicles had questionable data and only two regularly exceeded a likely 300kWh energy consumption on any given day, suggesting their rounds replacement should be the last, giving several years for battery energy density and capacity to improve. The full detailed report on eRCV suitability is available in Section 10.2 of the initial fleet review. We have been advised food waste rounds will not affect the mileage of existing RCVs.
With substantial reductions to electric vehicle procurement costs, we have re-evaluated the cost of replacement of a typical diesel RCV with an eRCV.
Because a BEV drive train has far fewer wearing parts it should cost less to maintain than a diesel equivalent. Some manufacturers even offer a ten-year, 300,000 mile battery warranty. The initial comparison is between electric and diesel vehicles over seven years. We have also considered the impact of keeping the electric vehicle for longer. However, it is acknowledged that after seven years, that a rig refurbishment is likely to be necessary at a cost of around £20,000 (included in Figure 6-3). We have also assumed charging losses of electricity at around 8%.

***Table 20-1:*** *Electric 26 tonne RCV fleet – factors used in the WLC energy model*

| RCV Factor | Electric | Diesel | HVO | Notes/Units |
|---|---|---|---|---|
| Annual Mileage/Vehicle | 14,400 | 14,400 | 14,400 | Fleet data |
| Energy Efficiency | 3.36 kWh/mile | 4.3 mpg | 4.1 mpg | EV and HVO calculated from diesel using factors. |
| Cost of energy/fuel | £0.19 | £1.21 | £1.38 | Base Cost April 2025. |
| Annual Inflation | Used today's prices, not included inflation due to unpredictability for fuel/energy | | | |

The cost savings from eRCV chassis maintenance are significant but the cost of maintaining the rig will be similar for both vehicle types. Future carbon taxes have not been considered but may be significant. Additional costs for Euro VII engines may add to future costs of diesel purchases. Reductions in electric energy costs may be achieved through additional generation or power purchase agreements.

***Table 20-2** Seven-year net capital cost of an electric and diesel RCV*

| Cost Summary | Renault D-Wide Electric 376kWh | Dennis Eagle Elite Diesel | Dennis Eagle Elite HVO | EV Cost (-Saving) | Notes |
|---|---|---|---|---|---|
| Vehicle Capital Cost | £335,000 | £217,000 | £217,000 | £118,000 | OEM data |
| Residual Value (Chassis) | -£10,000 | -£10,000 | -£10,000 | 0 | |
| OZEV Grant Funding | -£25,000 | n/a | n/a | -£25,000 | *First 100 UK vehicles, after which, £16,000 |
| Residual Value (Battery) | -£30,000 | n/a | n/a | -£30,000 | Estimated as 30% of battery |
| **Total lifetime Vehicle Cost** | **£270,000** | **£207,000** | **£207,000** | **£63,000** | |

The higher up front capital cost of the eRCV fleet is apparent in Table 20-2. The eRCVs still have a significant additional up front capital cost of up to £118,000 (much reduced from previous quotes). However, when the potential grant and residual value of the battery is taken into account, the lifetime gap drops to around £63,000. The residual value of the batteries could be higher than our estimate (they should have a long second life in energy storage and can be refurbished) and it is quite possible that in seven or ten years, an electric chassis will be worth much more than a diesel chassis, and possibly even have significant residual life. However, this is not realised until the vehicle is disposed of.

Table 6-3 shows estimates comparing the total costs of ownership of RCVs over seven years with costs such as capital, fuel, maintenance and VED all taken into account.

***Table 20-3** Seven-year WLC – includes fuel, AdBlue, VED and road user levy*

| Cost Summary | Electric | Diesel | EV Cost (-Saving) | HVO | EV Cost (-Saving) | Notes |
|---|---|---|---|---|---|---|
| Total fleet net capital cost | £270,000 | £207,000 | £63,000 | £207,000 | £63,000 | From previous table |
| Total energy cost | £64,430 | £128,948 | -£64,518 | £147,065 | -£82,635 | Includes inflation, assumes all depot charging |
| AdBlue Cost | | £2,611 | -£2,611 | £2,738 | -£2,738 | No inflation |
| SMR (ex-tyres) costs | £67,200 | £84,000 | -£16,800 | £84,000 | -£16,800 | Estimate with eRCV at 80% of ICE figures |
| VED + road user levy | £3,262 | £3,262 | £0 | £3,262 | £0 | DVLA V149/1 - 2025 Policy |
| Whole life cost | £404,892 | £425,821 | -£20,929 | £444,065 | -£39,173 | |

We would expect eRCVs to save about £64,000 in energy costs over seven years. They would also eliminate the need for 'adBlue' exhaust additive costs. Other savings arise from reduced chassis maintenance costs, although these may be offset by more body and lifter maintenance costs later in the life of the eRCV if kept for ten years.

There is therefore an estimated saving of about £21,000 (£3,000 a year) from operating an eRCV (over 7 years). The OZEV grant for 26t HCVs is £25,000, which is capped at five vehicles per year per organisation (£125,000), and £16,000 for the next ten vehicles. This amount will also vary according to how many vehicles have been sold nationally at the time of the grant application. The full grant is included within calculations, although it should be noted if the grant is not received then the forecast would be for a break-even whole life cost. However, it is probable that a 7-year-old EV chassis will have both residual warranty and a lot of life left and may command a sale premium as a stand-alone vehicle, which could further improve the cost outlook.

If the comparison is made between electricity and HVO, the WLC savings will be greater at over £39,000 (or £5,600 a year) over a seven-year life cycle.

It should be noted that with volatility and unpredictability of fuel and energy prices, modelling of future costs could be subject to significant variation in either direction. However, we would expect increased predictability of energy costs as the influence of renewables increases within the grid power mix.

The effects of changing fuel or energy prices over a seven year vehicle lifetime are summarised in Figure 6-1.

The points highlighted are April 2025 diesel costs and the cost of energy which at £0.19/kWh takes into account some limited use of the reduced overnight tariff to charge vehicles, but the vast majority of charging at the standard rate of £0.21/kWh.

This shows how much costs can potentially escalate based on changes in fuel or energy charges and they will not necessarily change in synchronisation with each other or even move in the same direction as each other.

We have also provided an Excel tool (Figure 6-2) that can calculate lifetime fuel and energy costs for HDC vehicles, with the ability to set parameters of annual mileage, mpg, energy/fuel cost, years retained, charging losses and proportion of diesel energy consumed by the EV.

***Figure 20-1** – effects of changing energy and fuel unit costs over the life of an HDC RCV*

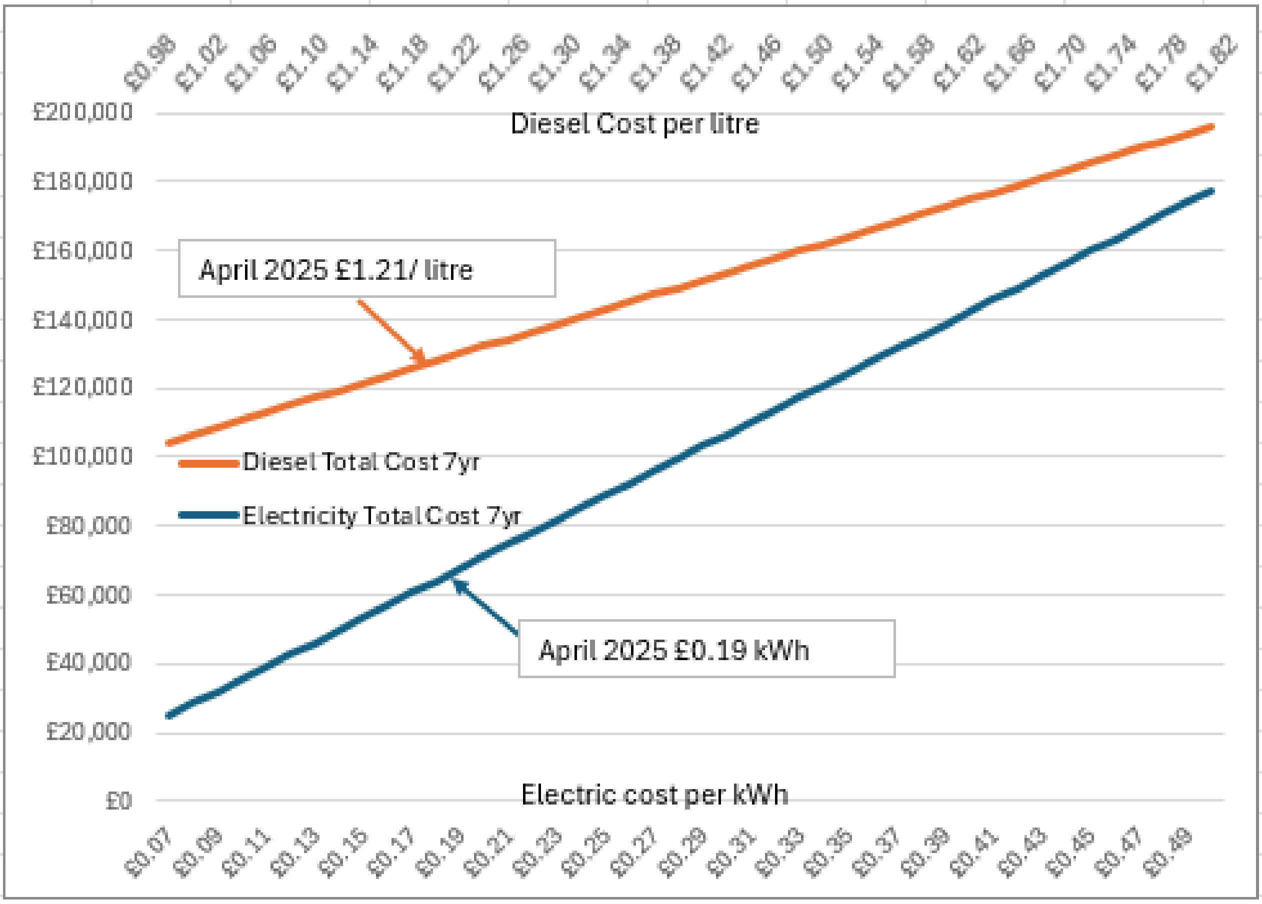


***Figure 20-2*** *– Calculator for EV energy cost savings Vs Diesel –* ***CLICK TO CHANGE FIGURES IN TOP BOX***

| SETTINGS | Enter Values |
|---|---|
| Annual Mileage | 14400 |
| MPG | 4.3 |
| Cost of Diesel | 1.22 |
| Cost of Energy | 0.19 |
| EV Energy (Diesel) | 0.3 |
| Years Retained | 7 |
| Charging losses | 10% |

| OUTPUTS | Totals |
|---|---|
| Annual cost of fuel | £18,573 |
| Annual cost of Electricity | £9,641 |
| Lifetime Cost of Fuel | £130,011 |
| Lifetime Cost of Electricity | £67,485 |
| Electric Energy Saving | £62,526 |
| Annual Electric Energy Saving | £8,932 |

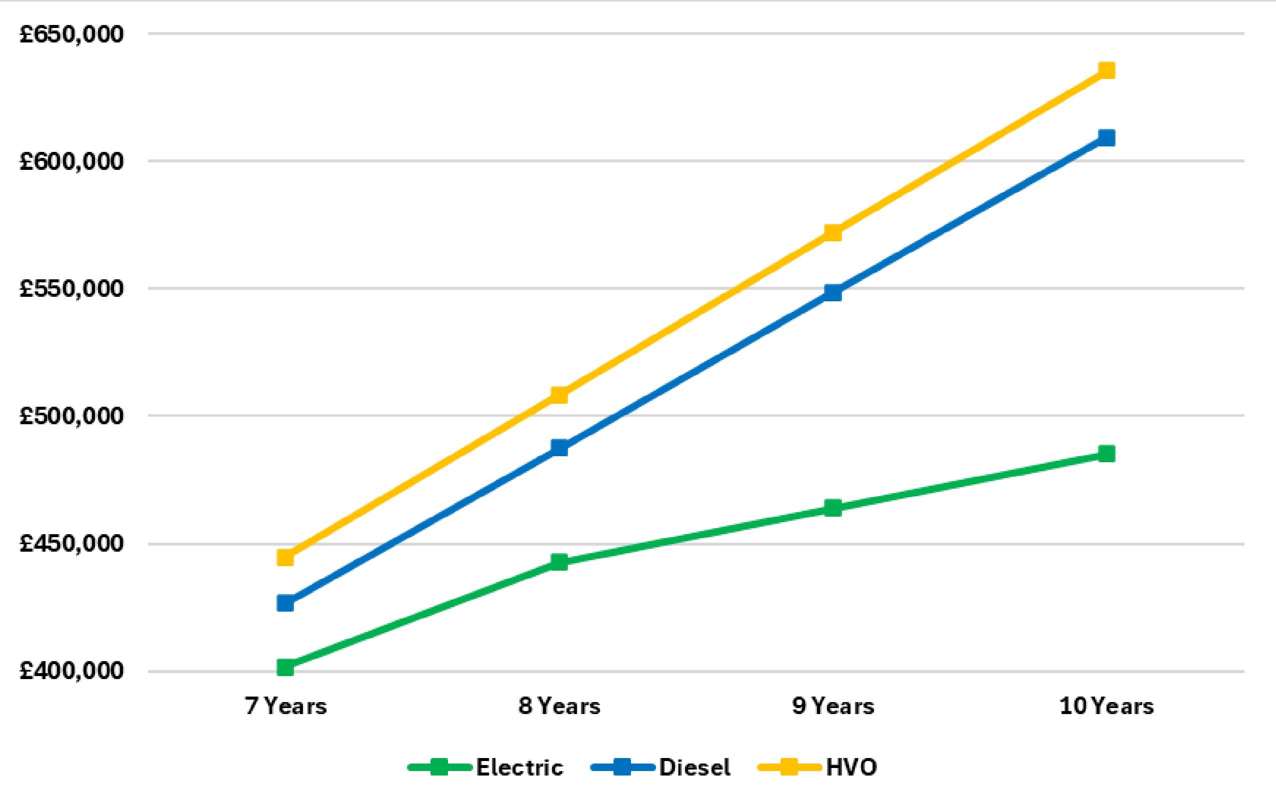
## Retaining RCVs for longer than seven years

HDC do not typically retain RCVs for longer than seven years. By this stage the body and lifters typically need a full refurbishment and other components for diesel vehicles such as gearboxes, clutches and emission control systems become much more prone to expensive and time-consuming failures.

The eRCV will still be under a battery warranty at seven years of age. There is a strong argument to suggest that if the body and lifters are refurbished that there would be significant residual life in an electric vehicle beyond the seven-year life span. We have factored in a £20,000 rig refurbishment at seven years and assumed no maintenance savings beyond year seven for the new eRCV and compared this to the proportionate cost of buying a new diesel after seven years (not including inflation).

Because the main saving in using an eRCV is energy costs, the savings achieved by keeping an eRCV beyond seven years are significant. This is exaggerated further by the cost of purchasing a new diesel vehicle at seven years, which means more capital is needed to service the same time period. Taking the approach of allocating 1/7$^{th}$ of the net capital cost for the second diesel vehicle to each subsequent year, Figure 6-3 illustrates that the whole life cost savings achieved by longer retention of electric vehicles beyond seven years increase significantly. This is providing the battery does not require replacement (at which point the vehicle should be disposed or refurbished) and the battery will still be very likely to be suitable for non-vehicle propulsion related energy storage, which is typically much less intensive.

***Figure 20-3*** *Cost forecast for ICE RCVs compared to diesel RCVs from 7 years to 10 years*




There is only a slight divergence in costs between diesel and HVO, reflecting the price difference (approximately 16p a litre), which is relatively insignificant compared to the total combined level of capital, maintenance and fuel expenditure. However, both increase a lot more rapidly than a retained eRCV. This is even more exaggerated in the years after the extra cost of a rig refurbishment has been undertaken at seven years.

Whilst there would be no need to extend eRCV use beyond seven years to deliver a whole life cost saving at HDC, the longer retention would clearly deliver significant savings for as long as vehicles can be reliably operated. Whilst this doesn't change up-front costs, it does also enable costs of infrastructure to be reconciled. Across the whole fleet, with 10-year retention, this could add up to as much as £34,700 a year in reduced costs with a fully electric RCV fleet when compared to diesel and £42,000 a year compared to HVO.

## Emissions

Emission reductions from a switch to eRCVs were summarised for 10 years in the previous document. Figures for a seven-year retention are summarised in Table 6-4 (for one vehicle).

***Table 20-4*** *Seven-year energy use (kWh) and GHG Emissions (kg $CO_2e$) of an electric and diesel RCV fleet*

| Energy Use and GHG | Electric | Diesel | EV Cost (-Benefit) | Notes |
|---|---|---|---|---|
| Energy consumption (kWh) | 339,107 | 1,130,355 | -791,249 | Assumes 70% reduction |
| Scope 1 kg $CO_2e$ | | 267,736 | -267,736 | BEIS Factors |
| Scope 1 AdBlue kg $CO_2e$ | | 812 | -812 | Used by SCR – BEIS |
| Scope 2 kg $CO_2e$ | 47,621 | 0 | 47,621 | UK Grid – Predicted |
| Scope 3 T&D kg $CO_2e$ | 4,214 | 0 | 4,214 | UK Grid – Predicted |
| Scope 3 WTT kg $CO_2e$ | 13,497 | 64,992 | -51,495 | BEIS Factors |
| WL WTW GHG (kg $CO_2e$) | 65,332 | 333,540 | -268,209 | **-268 tonnes over vehicle life** |

Over the seven-year lifetime of an eRCV, total GHG emissions will reduce by 268 tonnes and 80% after seven years. The eRCVs have no Scope 1 emissions - all the GHG emissions are Scope 2, from the generation of electricity and Scope 3 from transmission and distribution (T&D) losses as well as 'WTT' emissions at the generator. All of these will fall over the lifetime of the project, as the UK Grid decarbonises. This gives potential to reduce emissions by over 1,000t per year across the whole fleet.

## 21. VEHICLE REPLACEMENT PROGRAMME

The following is a summary of the replacement programme for all vehicles that have not yet been replaced by electric vehicles. New diesel vehicles that are required are subsequently included again in the programme in later years for electric replacements (therefore are essentially included twice). However, once vehicles are replaced by electric vehicles, replacements of updated electric vehicles are not repeated, to keep this programme focused on decarbonisation and also taking the view that future replacement cycles of EVs will benefit from flexibility in replacement intervals, given a potentially longer life cycle.

***Table 21-1** – Summary of programme to transition vehicles to EV, with estimated total costs and worst case infrastructure costs.*

| Programme year | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | First time electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Budget for infrastructure (worst case) | Emissions reductions from new vehicles | Estimated total annual emissions reduction |
|---|---|---|---|---|---|---|---|---|---|
| 2025/26 | 25 | £1,148,400 | 8 | £578,600 | £97,300 | 13 | £275,500 | 62.0t | 62.0t |
| 2026/27 | 2 | £52,700 | 21 | £1000,200 | >£169,400 | 0 | £441,500 | 92.1t | 154.1t |
| 2027/28 | 0 | £150,000 | 14 | £2,239,065 | £401,100 | 0 | £85,000 | 246.7t | 400.8t |
| 2028/29 | 0 | N/A | 6 | £1,402,300 | £251,900 | 0 | £70,000 | 157.2t | 558.0t |
| 2029/30 | 0 | N/A | 17 | £2,045,000 | £283,600 | 0 | £37,500 | 187.4t | 745.4t |
| 2030/31 | 0 | N/A | 5 | £1,377,555 | £250,100 | 0 | £30,000 | 157.3t | 902.7t |
| 2031/32 | 0 | N/A | 5 | £1,773,000 | >£250,000 | 0 | £45,000 | 218.3t | 1121.0t |
| 2032/33 | 0 | N/A | 14 | £3,205,000 | >£187,600 | 0 | £60,000 | >114.9t | 1235.9t |
| 2033/34 | 0 | N/A | 6 | £480,100 | £57,700 | 0 | £32,500 | 38.8t | 1274.7t |
| 2034/35 | 0 | N/A | 2 | £80,000 | Unknown | 0 | N/A | 4.8t | 1279.5t |
| 2035/36 | 0 | N/A | 4 | £414,000 | Unknown | 0 | N/A | 9.8t | 1289.3t |
| 2038/39 | 0 | N/A | 3 | £320,000 | Unknown | 0 | N/A | Unknown | >1,289.3t |

- Each year's programme is broken down in more detail from Table 6-2 to Table 6-16.
- The programme is set in the context of charging infrastructure that is likely to be available. In some cases this results in suggestions for deferring some vehicle replacements and also results in some new diesel vehicles being required.
- Amounts allocated reflect current 2025 prices and do not factor in inflation. This is best calculated each year as figures are known.
- EV emissions are based on the 2024 grid factor of 125g/$CO_2$ per kWh.

***Table 21-2** - 2025/26 Replacement programme – in detail*

| Registration | Vehicle type | Diesel replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| LN65UVB | 15-18t | £90,000 | £220,000 | £22,590 | Defer if possible – insufficient grid capacity |

| Registration | Vehicle type | Diesel replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VE18JNX | RCV 26t | £216,152 | £335,000 | £62,524 | Insufficient grid capacity buy Diesel |
| VE18JWF | RCV 26t | £216,152 | £335,000 | £62,524 | Insufficient grid capacity buy Diesel |
| VE18JXA | RCV 26t | £216,152 | £335,000 | £62,524 | Insufficient grid capacity buy Diesel |
| VU67HXY | RCV 26t | £216,152 | £335,000 | £62,524 | Buy EV – first eRCV will help shape use of subsequent purchases |
| EX09LCL | 3.5t Van | £29,195 | £37,555 | £3,316 | Buy electric replacement |
| WV67HWM | 3.5t Van | £33,970 | £48,754 | £15,029 | EV is 3.9t Buy EV or defer |
| CE14BTF | 7.5t-12t | £85,000 | £117,000 | £7,504 | Insufficient grid capacity buy Diesel |
| B800AAV | Other | £50,000 | N/A | N/A | No EV Offered buy diesel |
| AK63FZA | Tractor | £15,000 | N/A | N/A | No EV Offered buy diesel |
| EU18EFH | Tractor | £15,000 | N/A | N/A | No EV Offered buy diesel |
| EU18EFJ | Tractor | £15,000 | N/A | N/A | No EV Offered buy diesel |
| EU18EFK | Tractor | £15,000 | N/A | N/A | No EV Offered buy diesel |
| KU12WFM | 7.5t-12t | £80,000 | £117,000 | N/A | Insufficient grid capacity buy Diesel |
| EU17AEG | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU17AEJ | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU21CCK | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU21CCN | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU21CCO | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU21CDK | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| EU21CFK | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| AE16BVZ | Mower | £35,634 | N/A | N/A | No EV Offered buy diesel |
| LL67XCG | 3.5t Tipper | £33,013 | £47,958 | £7,666 | Assume 4.25t needed - defer |
| LL67XCH | 3.5t Tipper | £33,013 | £47,958 | £17,722 | Needs an 89kWh version, Assume 4.25t |
| LM67NWU | 3.5t Tipper | £33,013 | £47,958 | £5,709 | Assume 4.25t needed - defer |
| LM67UXL | 3.5t Tipper | £33,013 | £47,958 | £9,059 | Assume 4.25t needed - defer |
| LM67UXO | 3.5t Tipper | £33,013 | £47,958 | £4,962 | Assume 4.25t needed - defer |
| LM67UXX | 3.5t Tipper | £33,013 | £47,958 | £2,714 | Assume 4.25t needed - defer |
| LM67UXY | 3.5t Tipper | £33,013 | £47,958 | £10,211 | Assume 4.25t needed - defer |

| Registration | Vehicle type | Diesel replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| LM67UXZ | 3.5t Tipper | £33,013 | £47,958 | £4,319 | Assume 4.25t needed - defer |
| LM67UYB | 3.5t Tipper | £33,013 | £47,958 | £6,929 | Assume 4.25t needed - defer |
| LM67UYC | 3.5t Tipper | £33,013 | £47,958 | £6,916 | Assume 4.25t needed - defer |
| LO67LGK | 3.5t Tipper | £33,013 | £47,958 | £13,779 | Assume 4.25t needed - defer |
| LO67OEN | 3.5t Tipper | £33,013 | £47,958 | £13,909 | Diesel Replacement needed before EV rule change is possible |
| LO67OER | 3.5t Tipper | £33,013 | £47,958 | £13,244 | Diesel Replacement needed before EV rule change is possible |
| LO67OEX | 3.5t Tipper | £33,013 | £47,958 | £30,339 | Needs longer range than currently available – Buy Diesel |
| LO67OEY | 3.5t Tipper | £33,013 | £47,958 | £14,353 | Diesel Replacement needed before EV rule change is possible |
| LO67YKS | 3.5t Tipper | £33,013 | £47,958 | £18,523 | Diesel Replacement needed before EV rule change is possible |
| WM18AAF | 3.5t Tipper | £33,013 | £47,958 | £15,798 | Assume 4.25t needed - defer |
| LP17HTL | 3.5t Van | £29,195 | £37,555 | £3,846 | Buy electric replacement |
| LP17HTX | 3.5t Van | £29,195 | £37,555 | £4,442 | Buy electric replacement |
| LP17HUK | 3.5t Van | £29,195 | £37,555 | £3,879 | Buy electric replacement |
| KF17DXC | Small Van | £16,908 | £22,302 | £2,446 | Buy electric replacement |
| LP66GZY | Small Van | £16,908 | £22,302 | £1,823 | Buy electric replacement |

***Table 21-3 -** 2025/26 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| 3.5t Van | 0 | N/A | 5 | £199,000 | £30,500 | 0 | N/A | 20.5t |
| 3.5t Tipper | 5 | £165,000 | 0 | N/A | N/A | 12 | £590,900 | Nil |
| Small Van | 0 | N/A | 2 | £44,600 | £4,300 | 0 | N/A | 3.2t |
| 7.5t-12t | 2 | £165,000 | 0 | N/A | N/A | 0 | N/A | Nil |
| 18t Skip loader | 0 | N/A | 0 | N/A | N/A | 1 | £220,000 | Nil |
| 26t RCV | 3 | £432,300 | 1 | £335,000 | £62,500 | 0 | N/A | 38.3t |
| Plant (inc mower/tractor) | 15 | £395,100 | 0 | N/A | N/A | 0 | N/A | Nil |
| **Totals** | **25** | **£1,148,400** | **8** | **£578,600** | **£97,300** | **13** | **£810,900** | **62.0t** |

- According to previous grid connection analysis, the grid connection always has at least 40kVa and almost always 50kVa spare capacity between 15:30 and 06:30. Providing the charging units are timed as a safeguard, (or even better, load balanced), this would be enough to allow for charging of an eRCV at 22kW and a further four 7.5kW charge points to be provided. This would allow the eRCV replacement for WV67HWM to be fully charged every night and the other six new electric vans to be charged on alternate evenings. If a charge point is required for each vehicle, every night then load-balancing and smart charging will be essential to ensure the system does not become overloaded.
- The only way more electric vehicles could be charged on the current grid connection, prior to its proposed expansion would be through installing a battery, which may not be necessary in the long term, and so may not be a justified expense.
- Therefore, three of the 26t RCVs programmed for 2025/26 should be diesel, as well as the replacement for the 11t Recycling vehicle, otherwise a backlog of unsuitably aged vehicles may develop in these intensive use categories.
- For the 18t skip loader, LN65UVB, it does not appear that replacement is long past being due, so it may be possible to defer this replacement until the grid connection is upgraded (depending on the current state of repair for this vehicle).
- There are 17 tippers due for replacement. Only one vehicle (LO67OEX) is not suited to an EV replacement and should be replaced by a new diesel equivalent. Four more diesels are needed urgently due to vehicle condition.
- Purchasing diesel vehicles for the remaining 16 will not help HDC's decarbonisation plans. These should be replaced by electric vehicles. However, this will need to be deferred until the improved grid connection is in place.
- Deferring will also help because to obtain a larger payload, 4.25t BEVs will be needed, which currently have operational complications relating to annual MOT tests at HGV test stations, tachographs and driver licensing. We are awaiting the outcome of the response to the Government consultation, which is widely expected to remove these barriers. However, if it does not, then it may still be necessary to purchase diesel for operational expediency. Deferral of tippers to 26/27 therefore offers two significant advantages to HDC.

***Table 21-4** - 2026/27 Replacement programme in detail*

| Registration | Vehicle type | Diesel/ petrol replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| 12 3.5t Tipper | 3.5t Tipper | £396,200 | £575,500 | £120,600 | Carried over from 25/26. 11 * 4.25t 68kWh battery |
| LN65UVB | 15-18t | £90,000 | £220,000 | £22,590 | Carried over from 25/26 |
| AF63JAO | Car | £12,713 | £20,014 | £2,803 | Buy electric replacement |
| AJ13BBF | Car | £12,713 | £20,014 | £2,840 | Buy electric replacement |
| AJ13RHK | Car | £12,713 | £20,014 | £1,548 | Buy electric replacement |
| AJ13UGB | Car | £12,713 | £20,014 | £2,081 | Buy electric replacement |
| AJ14WDZ | Car | £12,713 | £20,014 | £6,615 | Buy electric replacement |
| AJ14WEW | Car | £12,713 | £20,014 | £2,197 | Buy electric replacement |
| AJ13RGZ | Car | £12,713 | £20,014 | Unknown | Buy electric replacement |
| AF62XHW | Car | £12,713 | £20,014 | £1,400 | Buy electric replacement |

| Registration | Vehicle type | Diesel/ petrol replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| BW66TKO | 4x4 Pick up | £26,363 | N/A | N/A | No EV expected to be available – expect to defer or buy Diesel |
| BW66XHV | 4x4 Pick up | N/A | N/A | N/A | Replacement not planned |
| BW66XYG | 4x4 Pick up | £26,363 | N/A | N/A | No EV expected to be available – expect to defer or buy Diesel |
| KE66UJG | Small Van | £14,876 | £22,302 | £2,737 | Buy electric replacement |
| KE66UJP | Small Van | £14,876 | £22,302 | £3,500 | Buy electric replacement (fuel cost approximate) |

***Table 21-5*** *- 2026/27 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| 3.5t Tipper | 0 | N/A | 12 | £575,500 | £120,600 | 0 | N/A | 64.8t |
| Small Van | 0 | N/A | 2 | £44,600 | £6,200 | 0 | N/A | 3.2t |
| 18t Skip loader | 0 | N/A | 1 | £220,000 | £22,600 | 0 | N/A | 9.7t |
| Car | 0 | N/A | 8 | £160,100 | >£20,000 | 0 | N/A | 14.4t |
| 4x4 Pick up | 2 | £52,700 | 0 | N/A | N/A | 0 | N/A | Nil |
| **Totals** | **2** | **£52,700** | **21** | **£1,000,200** | **>£169,400** | **0** | **N/A** | **92.1t** |

- Additional EV purchases are largely dependent on the successful completion of the substation for the installation of sufficient charging points unless an interim solution is possible with battery power or otherwise.
- In the unlikely event of lead times for the substation not being suitable then further deferment of the tippers, cars and 18t skip loader may be necessary.
- By this stage the situation for 4.25t EV tippers will be clearer. If legislation is favourable, then EVs should remain the commitment. However, if regulations for 4.25t EVs remain arduous, the prospect of more diesel vehicles should be re-considered.
- The lack of RCVs in the 25/26 programme is very helpful in allowing time for both substation completion and the construction of the correct, well-placed infrastructure on the site for future electric vehicles.

***Table 21-6****- 2027/28 Replacement programme – in detail*

| Registration | Vehicle type | Diesel/ petrol replacement Cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| LF71ZNK | Sweeper | £150,000 | £250,000 | £8,454 | EV cost is estimated. Review as may not be economical or viable at this stage due to short life of sweeper components. |
| VK20NTN | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |

| Registration | Vehicle type | Diesel/ petrol replacement Cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VK20NTO | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VK20NTT | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VK20XWJ | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VX70ZMO | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VX70ZMU | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| AF69EJD | 3.5t Van | £29,195 | £37,555 | £1,363 | Buy electric replacement |
| BJ17KYT | Pick up | £26,363 | £40,000 | £4,662 | EV is estimated – future availability and cost assumed. Diesel may be needed if functional and cost effective EV is not available |
| EA17TUO | Pick up | £26,363 | £40,000 | £5,308 | |
| LT67ULJ | Small Van | £14,876 | £22,302 | £4,072 | Buy electric replacement |
| LT67XVD | Small Van | £14,876 | £22,302 | £3,343 | Buy electric replacement |
| LT67XVJ | Small Van | £14,876 | £22,302 | £1,212 | Buy electric replacement |
| DW19OYB | Small Van | £16,908 | £22,302 | £2,061 | Buy electric replacement |
| DW19PCZ | Small Van | £16,908 | £22,302 | £3,991 | Buy electric replacement |

***Table 21-7** - 2027/28 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| Sweeper | 1 | £150,000 | 0 | N/A | N/A | 0 | N/A | Nil |
| Small Van | 0 | N/A | 5 | £111,510 | £14,680 | 0 | N/A | 8t |
| 3.5t Van | 0 | N/A | 1 | £37,555 | £1,363 | 0 | N/A | 4.1t |
| 26t RCV | 0 | N/A | 6 | £2,010,000 | £375,100 | 0 | N/A | 229.8t |
| 4x4 Pick up | 0 | N/A | 2 | £80,000 | £10,000 | 0 | N/A | 4.8t |
| **Totals** | **0** | **£150,000** | **14** | **£2,239,065** | **£401,143** | **0** | **N/A** | **246.7t** |

- It is highly likely that a viable electric 4x4 pickup will exist in 27/28, although at this stage we cannot be certain, and price is estimated at this stage.
- Assuming the substation and infrastructure is in place for the whole HGV fleet, this is when the RCV electrification begins in earnest. We would expect an even closer capital cost between diesel and electric by this stage, based on advancing battery technology.
- The sweeper will need to be re-evaluated for diesel or electric purchase. Currently the electric capital costs are very high and very unlikely to be offset by relatively modest fuel savings over the short life of a sweeper (dictated by the expected short life and high

expense of repairing auxiliary components). However, if the capital cost of an EV sweeper has come down to £200,000 or closer to the diesel price by this stage, this approach should be revised to procure an electric version.

- We would expect the price of electric and diesel vans to be closer to parity by this stage, although much of this may be reflected in increased diesel vehicle costs.

***Table 21-8*** *- 2028/29 Replacement programme – in detail*

| Registration | Vehicle type | Diesel/ petrol replacement Cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VA21ZGN | RCV 26t | £216,152 | £300,000 | £62,524 | Buy electric replacement |
| VA21ZGO | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VA21ZGP | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VA21ZGR | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| BX68BDF | Pick up | £26,363 | £40,000 | £1,777 | Buy electric replacement or dispose if still low usage |
| AE20WNO | Small Van | N/A | £22,302 | N/A | Vehicle already an EV buy electric replacement if current vehicle is no longer serviceable |

***Table 21-9*** *- 2028/29 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| Small Van | 0 | N/A | 1 | £22,300 | N/A | 0 | N/A | 1.6t |
| 26t RCV | 0 | N/A | 4 | £1,340,000 | £250,100 | 0 | N/A | 153.2t |
| 4x4 Pick up | 0 | N/A | 1 | £40,000 | £1,800 | 0 | N/A | 2.4t |
| **Totals** | **0** | **N/A** | **6** | **£1,402,300** | **£251,900** | **0** | **N/A** | **157.2t** |

- By 28/29 we would expect all new vehicles could be replaced by electric equivalents, even if exact examples cannot be specified now.
- Electric vehicle prices relative to diesel will be much closer. There is a strong probability amounts paid for EVs could be significantly less than current costs, although this depends on many factors, such as inflation and trade tariffs.

*Table 21-10 - 2029/30 Replacement programme – in detail*

| Registration | Vehicle type | Diesel/ petrol replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| 8 Mower | Mower | £285,000 | £400,000 | Est £20,000 | EV cost estimated - buy electric replacements – Replacing 25/26 purchases |
| 4 Tractor/Mule | Tractor | £60,000 | £80,000 | EST £5,000 | EV cost estimates - buy electric replacements – Replacing 25/26 purchases |
| LD23XXH | Sweeper | £150,000 | £225,000 | £8,500 | EV cost estimated, assumes reduction - Buy electric replacement |
| VK22BXX | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VK22BXY | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VK22BXZ | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VK22BYA | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |

*Table 21-11 - 2029/30 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| Mower | 0 | N/A | 8 | £400,000 | Est £20,000 | 0 | N/A | 22.4t |
| Tractor/Mule | 0 | N/A | 4 | £80,000 | Est £5,000 | 0 | N/A | Unknown |
| Sweeper | 0 | N/A | 1 | £225,000 | £8,500 | 0 | N/A | 11.8t |
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 0 | N/A | 153.2t |
| **Totals** | **0** | **N/A** | **17** | **£2,045,000** | **£283,600** | **0** | **N/A** | **187.4t** |

- The mowers and tractor/mules bought in 25/26 will need replacing again. It is assumed that viable electric versions will be available at a competitive price, however, we have estimated a high price.
- 2029/30 will be the last opportunity to buy an ICE vehicle under 3.5t, although this will not be necessary. We can assume all prior electric vehicle purchases will be replaced with further electric vehicles from this point, and as such have not programmed these.

***Table 21-12*** *- 2030/31 Replacement programme – in detail*

| Registration | Vehicle type | Diesel/ petrol replacement cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VN23UDU | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VN23CCZ | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VN23CDE | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VN23HWJ | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| YP72MXS | 3.5t Van | N/A | £37,555 | N/A | Buy electric replacement |

***Table 21-13*** *-2030/31 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 0 | N/A | 153.2t |
| 3.5t Van | 0 | N/A | 1 | £37,555 | N/A | 0 | N/A | 4.1t |
| **Totals** | **0** | **N/A** | **5** | **£1,377,555** | **£250,100** | **0** | **N/A** | **157.3t** |

***Table 21-14*** *- 2031/32 Replacement programme – in detail*

| Registration | Vehicle type | Diesel/ petrol replacement Cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VN24YTP | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VN24YTR | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| VN24YTS | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |

| Registration | Vehicle type | Diesel/ petrol replacement Cost | EV replacement cost | Fuel saving | Comments |
|---|---|---|---|---|---|
| VN24YTT | RCV 26t | £216,152 | £335,000 | £62,524 | Buy electric replacement |
| LN74JXZ | RCV 7.5t | £97,000 | £170,000 | Unknown | Price Estimated -buy EV replacement |
| LN74JYA | RCV 7.5t | £97,000 | £170,000 | Unknown | Price Estimated -buy EV replacement |
| BD74EHC | Tipper 7.2t | £74,000 | £93,000 | Unknown | Buy electric replacement |

***Table 21-15** -2031/32 Summary*

| Fleet category | Diesel vehicles needed | Diesel capital costs (ex VAT & delivery) | Electric vehicles needed | EV capital costs (ex VAT & delivery) | Lifetime EV energy cost savings | Vehicles to defer | Deferred vehicles EV cost (ex VAT & delivery) | Estimated annual emissions reduction |
|---|---|---|---|---|---|---|---|---|
| RCV 26t | 0 | N/A | 4 | £1,340,000 | £250,100 | 0 | N/A | 153.2t |
| RCV 7.5t | 0 | N/A | 2 | £340,000 | Unknown | 0 | N/A | 43.2t |
| Tipper 7.2t | 0 | N/A | 1 | £93,000 | Unknown | 0 | N/A | 21.9t |
| **Totals** | **0** | **N/A** | **7** | **£1,773,000** | **>£250,000** | **0** | **N/A** | **218.3t** |

*Table 21-16 - 2032/33 Onwards – replacement programme*

| Replacement year | Vehicle quantity | Vehicle type | EV replacement cost | Fuel saving | Estimated annual emissions reduction | Comments |
|---|---|---|---|---|---|---|
| 32/33 | 3 RCVs | RCV 26t | £1,005,000 | £187,600 | 114.9t | Replacing the 3 new diesels procured 2025/26 |
| 32/33 | 11 12t RCVs | Food Waste 12t | £2,200,000 | Unknown | Unknown | Replacing Food Waste Fleet with EV – Price estimated |
| 33/34 | 5*3.5t Tipper | 3.5t Tipper | £255,100 | £57,700 | 27t | LO67OEX replacement – large battery needed<br>4 others with standard 68kWh battery |
| 33/34 | 1*Sweeper | Sweeper | £225,000 | £8,500 | 11.8t | EV to replace LF71ZNK replacement |
| 34/35 | 2*Pickups | 4x4 Pickup | £80,000 | Unknown | 4.8t | 2 EVs if diesels are procured in 27/28 |
| 35/36 | 2*Pickups | 4x4 Pickup | £80,000 | Unknown | 4.8t | 2 EVs if diesels are procured in 27/28 |
| 35/36 | 1*Tractor | Kubota M5111 | £100,000 | Unknown | Unknown | EV Tractors needed prices unpredictable, availability assumed |
| 35/36 | 2*7.5t | Box & Tipper | £234,000 | Unknown | Unknown | Replacing the replacements of CE14BTF and KU12WFM |
| 38/39 | 1*Tractor | John Deere | £90,000 | Unknown | Unknown | EV Tractors needed prices unpredictable, availability assumed |
| 38/39 | 1*Tractor | Kubota L1382H | £70,000 | Unknown | Unknown | EV Tractors needed prices unpredictable, availability assumed |
| 38/39 | 1*Tractor | Kubota M5112 | £160,000 | Unknown | Unknown | EV Tractors needed prices unpredictable, availability assumed |

- This is only for remaining ICE vehicles – it is assumed that all prior EVs are subsequently replaced with EVs in due course
- Assumptions made for viable EV availability in Tractor and Food Waste classes. Fuel savings unknown where fuel use of prior generation of vehicle is not yet known.
- Programme will be completed in time for 2040 target date. There may be some small residual emissions from grid electricity, depending on the national energy mix at the time.

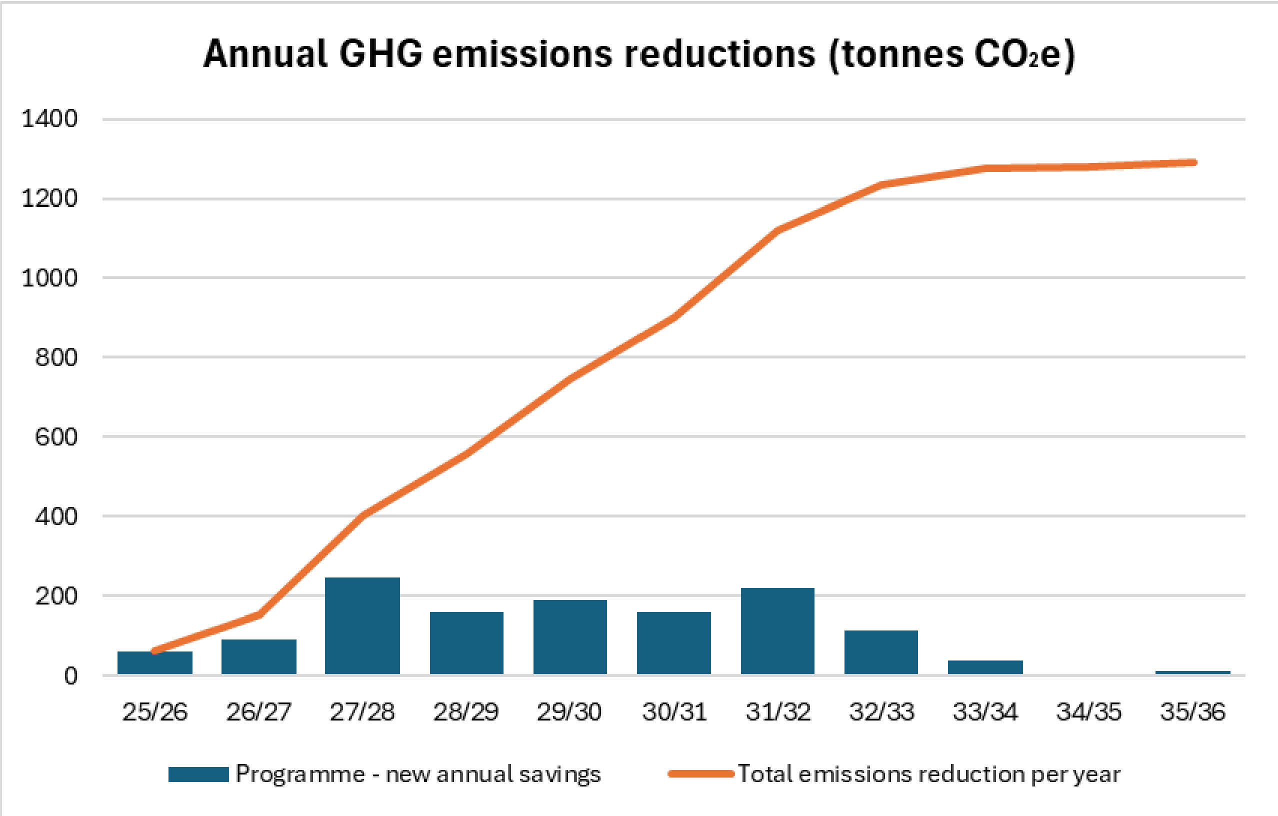
## 22. EMISSIONS REDUCTION RESULTING FROM VEHICLE REPLACEMENT PROGRAMME

As electric vehicles are purchased according to the replacement programme, emissions savings will begin to accumulate. Early savings are expected to be modest, due to relatively limited grid capacity. However, with some replacements deferred, this will mount up rapidly from 2027/28.

Nearly 98% of the quantified emissions savings will be achieved by 2032/33, with just small numbers of remaining vehicles and tractors needing to follow to complete the fleet electrification. Vehicles which are currently not part of the emissions accounting (such as soon to arrive diesel food waste vehicles) will also be electric by 2033.

The accumulated annual savings will be around 1,300t, based on today's grid factors. We would expect the level of emissions to have reduced still further as the grid factors reduce in response to more renewable energy sources, which could put actual savings closer to 1,500t by this time. However, the future grid carbon intensity is not possible to predict accurately at this stage.

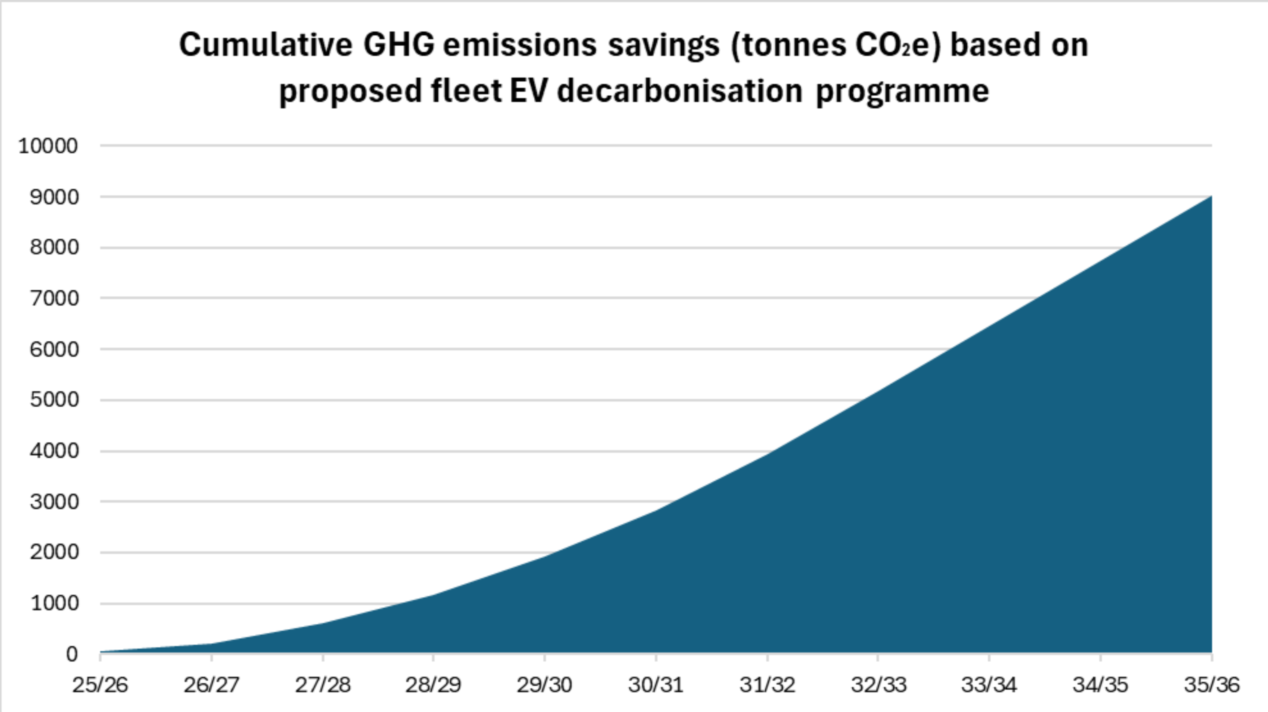
***Figure 22-1** – Annual emissions reduction in line with vehicle replacement programme.*




Whilst the annual emission reduction figures are substantial and leave only a small amount of 'Scope 2' electric emissions to remain in connection with the fleet, a more impressive cumulative total of emissions savings also builds over time.

The sooner emissions savings are delivered by the replacement of vehicles with electric alternatives, the sooner the environmental benefits will multiply with accumulation of emissions savings which maximises the difference that HDC's fleet decarbonisation policies can make.

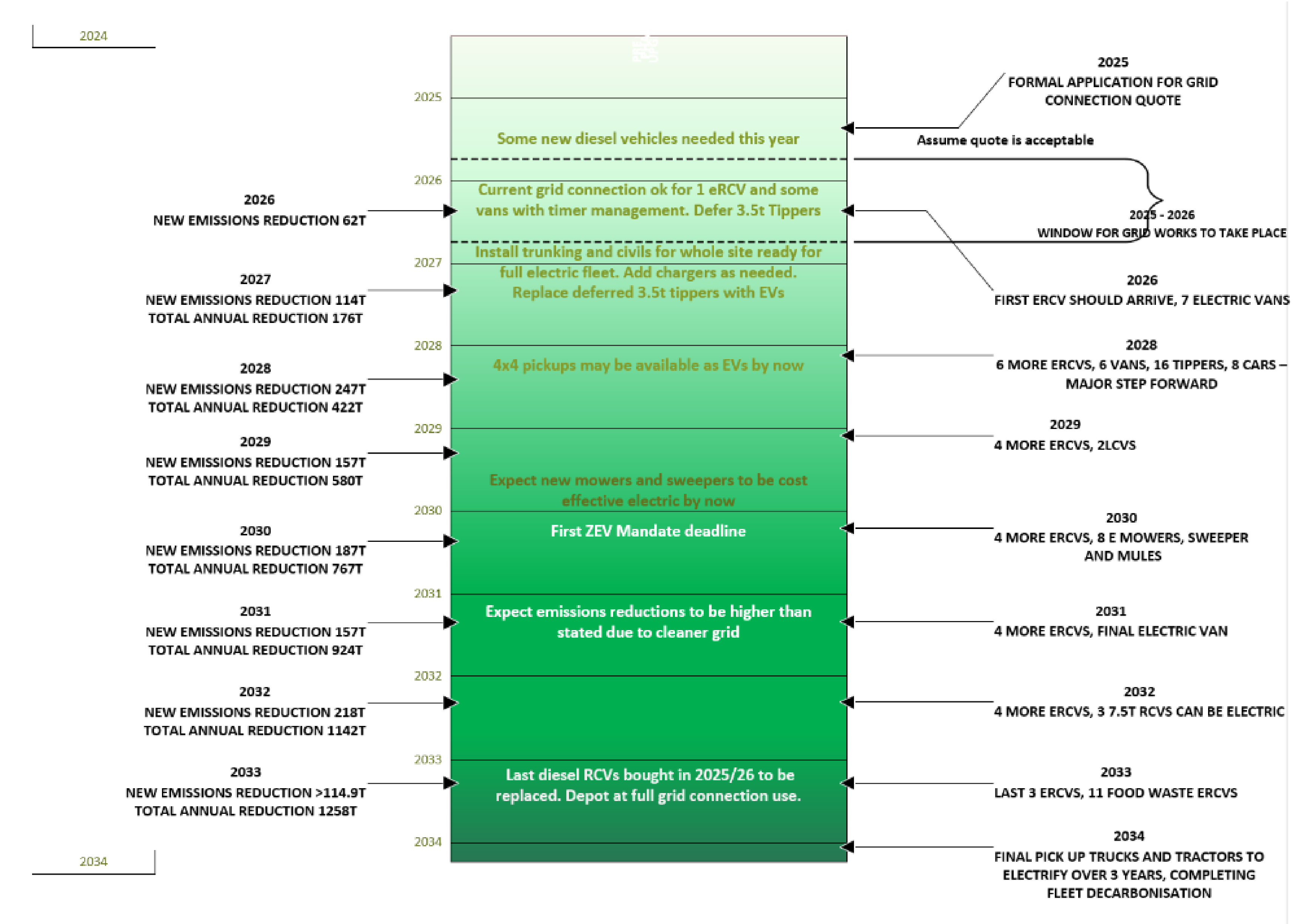
***Figure 22-2**– Cumulative emissions reduction based on suggested replacement programme*




The shallow gradient at the start (left side) of Figure 22-2 reflects the inevitably slow start to the electrification process which is limited by grid connection size and the time it takes to install an upgrade at the Eastfield House depot.

A timeline that summarises emissions reductions, against the vehicle replacement programme, actions and other external factors is shown in Figure 8-3.

***Figure 22-3*** *– HDC fleet decarbonisation timeline*



2024
2025
Some new diesel vehicles needed this year
2026
Current grid connection ok for 1 eRCV and some vans with timer management. Defer 3.5t Tippers
2027
Install trunking and civils for whole site ready for full electric fleet. Add chargers as needed. Replace deferred 3.5t tippers with EVs
2028
4x4 pickups may be available as EVs by now
2029
Expect new mowers and sweepers to be cost effective electric by now
2030
First ZEV Mandate deadline
2031
Expect emissions reductions to be higher than stated due to cleaner grid
2032
2033
Last diesel RCVs bought in 2025/26 to be replaced. Depot at full grid connection use.
2034
2034
2026 NEW EMISSIONS REDUCTION 62T
2027 NEW EMISSIONS REDUCTION 114T TOTAL ANNUAL REDUCTION 176T
2028 NEW EMISSIONS REDUCTION 247T TOTAL ANNUAL REDUCTION 422T
2029 NEW EMISSIONS REDUCTION 157T TOTAL ANNUAL REDUCTION 580T
2030 NEW EMISSIONS REDUCTION 187T TOTAL ANNUAL REDUCTION 767T
2031 NEW EMISSIONS REDUCTION 157T TOTAL ANNUAL REDUCTION 924T
2032 NEW EMISSIONS REDUCTION 218T TOTAL ANNUAL REDUCTION 1142T
2033 NEW EMISSIONS REDUCTION >114.9T TOTAL ANNUAL REDUCTION 1258T
2025 FORMAL APPLICATION FOR GRID CONNECTION QUOTE
Assume quote is acceptable
2025 - 2026 WINDOW FOR GRID WORKS TO TAKE PLACE
2026 FIRST ERCV SHOULD ARRIVE, 7 ELECTRIC VANS
2028 6 MORE ERCVS, 6 VANS, 16 TIPPERS, 8 CARS – MAJOR STEP FORWARD
2029 4 MORE ERCVS, 2LCVS
2030 4 MORE ERCVS, 8 E MOWERS, SWEEPER AND MULES
2031 4 MORE ERCVS, FINAL ELECTRIC VAN
2032 4 MORE ERCVS, 3 7.5T RCVS CAN BE ELECTRIC
2033 LAST 3 ERCVS, 11 FOOD WASTE ERCVS
2034 FINAL PICK UP TRUCKS AND TRACTORS TO ELECTRIFY OVER 3 YEARS, COMPLETING FLEET DECARBONISATION

## 23. ELECTRIC VEHICLE CHARGING INFRASTRUCTURE (EVCI) CAPACITY

Work from the previous fleet review calculated that if the whole fleet was electrified and every vehicle had either a 7.4kW charge point or a 22kW charge point commensurate with its ability to charge from empty to full overnight, then an additional capacity of around 1,070kVa would be needed to deliver this (or 900kVa with some sharing charge points for low use vehicles). However, when daily energy use was interrogated, it became clear that smart charging and load balancing could reduce this to an additional 665kVa based on the assumption all vehicles had their highest energy consumption level of the year on the same day over 14 hours. In practice, this builds in substantial contingency.

In all cases, the existing grid connection of 100kVa is inadequate to electrify all but a small part of the fleet and so needs an upgrade at the earliest opportunity to facilitate a time efficient fleet decarbonisation. Until then one eRCV and several electric vans could be accommodated with some level of time management for charging.

Since this analysis took place, HDC have ordered an additional 11 12t HGV food waste collection vehicles. Whilst these are diesel, their eventual replacements will need to be electric (scheduled for 2032/33), so will need to be accounted for in future grid specification. Total energy consumption of these 12t vehicles is not yet clear, but we would expect it to be significantly less than that for the 26t RCVs. We have recalculated likely energy demand since the first review.

**Charge points**

Generally, we expect every vehicle will have a parking bay and charge point of sufficiently high power during its 'down-time'. Low use vehicles that do not need a daily charge could be charged on alternate days, although load balancing would mean all could be charged at a lower rate to ensure the grid connection required is not too large to economically achieve.

### Charging heavy goods vehicles

HGVs, with very large batteries need enough power to recharge in time for the next shift. For HDC, 22 kW three-phase AC (400V, 32A) units will be sufficient. HDC should not need 50 kW+ DC chargers, if batteries of sufficient capacity are specified that can complete a shift in one charge. All RCVs for which an eRCV is a suitable replacement, would not need more than a 22kW AC charger available for 14 hours every day. If a vehicle can be operationally viable with regular AC charging, it is beneficial to both the longevity of the battery and the stability of the energy supply.

### Meeting the demand for BEV charging

It is possible to link the management of the energy available for charging BEVs to the site's 'domestic' load so that the charging control system can maximise the current it draws, as the load from the rest of the site falls. Each step-up in charger management requires more investment in the charging system but may avoid even more expensive capacity upgrades in the local grid and gives the fleet team greater visibility around demand and driver behaviour.

It is important to specify 'back office' software that gives clear visibility on the status of chargers and vehicles being charged to the fleet team, whenever required.

### Potential energy demand for an electrified HDC fleet

Taking a simplistic approach based on each vehicle or machine having a suitably sized charger available at all times (discounting those not based at Eastfield House) means adding up all charger capacities would give a total figure for maximum site energy demand. Clearly this would not all be needed until 2033 when the bulk of the fleet electrification is complete but should be planned for with just one upgrade to minimise cost and to secure the required connection.

With the inclusion of food waste vehicles, this now gives a total of around 1,300 kVA, when allowing 22kW for RCVs and 7.4kW for other vehicles at Eastfield House. This is not the recommended approach because it is likely to build in much unnecessary cost associated with the extra capacity and is not an efficient use of grid capacity that will also need to serve electrification of other local businesses.

A more efficient approach would be to understand the peak demands for charging and use smart charging to moderate charge levels over the available charging period. Table 9-1 was originally included in the initial fleet review and summarises potential maximum energy demand from the vehicles based at Eastfield House. However, it has been modified in this document to include an estimate for food waste vehicles and a further 10% contingency for 'charging losses'.

Calculations were carried out using different estimates depending on the quality of data available. The assumption that a BEV will use 30% of the energy of the diesel applied in all cases;

- The most accurate forecast is for the main energy consumer (RCVs). This is based on the real daily energy consumption, which was derived from daily refuelling and telematics. We have a high level of confidence in this data.
- Vehicles with Quartix telematics – used maximum daily mileage and annual energy consumption by vehicle. This figure will be a lot higher than reality across the fleet as all vehicles will never achieve peak usage on the same day. Therefore, we have used a value at 80% of the peak, which is still likely to give significant contingency.
- Vehicles without telematics – Average is taken from average daily mileage and fuel consumption. The peak demand is using the same factor that differentiated average and peak in Quartix vehicles (the peak was 2.07 times higher than the average) and taken as 80% of this value, because all vehicles will not encounter peak usage on the same day.
- Plant and Machinery – Calculated using aggregated fuel for all machines and the same factor for peak activity (80% of 2.07 times the mean).
- Food Waste collection vehicles – Using an estimate of 11 mpg and 12,000 miles a year, and a peak 25% above the average daily use (as per RCVs) due to vehicles being operated on a consistent 'rounds' basis.

***Table 23-1*** *Expected daily energy use from an electrified HDC fleet by data source*

| Activity level | Vehicle category | No. of vehicles at depot | Daily EV kWh at 30% of diesel | Total Daily kWh needed per vehicle on charge | 10% Charging losses | Total kVA for all vehicles to be charged fully (Over 14 hours) |
|---|---|---|---|---|---|---|
| Peak | RCV | 26 | 6,242 | 242 | 624 | 490 |
| Average | RCV | 26 | 4,940 | 190 | 494 | 388 |
| Peak* | Tracked vehicles | 21 | 1,163 | 55 | 116 | 91 |
| Average | Tracked vehicles | 21 | 714 | 34 | 71 | 56 |
| Peak* | Non tracked | 29 | 1,053 | 36 | 105 | 82 |
| Average | Non tracked | 29 | 636 | 22 | 64 | 45 |
| Peak* | Plant | 13 | 237 | 18.2 | 24 | 19 |
| Average | Plant | 13 | 141 | 10.9 | 14 | 11 |
| Peak* | Food Waste | 11 | 861 | 78 | 86 | 68 |
| Average | Food Waste | 11 | 689 | 63 | 69 | 54 |
| **Peak** | **Total** | **100** | **9,556** | **n/a** | **956** | **751** |
| **Average** | **Total** | **100** | **7,120** | **n/a** | **712** | **559** |

* *80% of highest combined energy consumption across all vehicles in category*

The hypothetical maximum daily energy demand using this method at Eastfield House is 9,556 kWh. It is based on all vehicle categories having peak energy consumption on the same day and as such represents a worst-case scenario. In these circumstances an electric vehicle fleet would demand an additional 751 kVA of energy capacity to charge over 14 hours, providing charger output is connected and controlled by a smart load balancing facility. This also assumes all vehicles would need to be fully charged following a 'worst-case' day, and a grid power factor of 1 as indicated by HDC in 2023.

Average figures are 7,120kWh in a day, which would equate to an additional energy demand of 559kVA. Overall, HDC should aim to upgrade the grid connection to around 800 to 850kVA, assuming there is no additional demand from expected from non-fleet related sources.

As previously stated, there is very little static capacity within the Eastfield House grid connection, and the 6,547kW dynamic capacity over a week would not even cover one average day of the week for a fully electric fleet if all of it was harnessed by a battery. Even in the summer with solar panels at optimum performance, spare capacity is at around 12,000kWh a week which does not cover two days activity, even assuming this power could all be stored and deployed overnight.

### Charging a fully electric fleet at Eastfield House

HDC have made pre-quote enquiries in late 2024 for the installation of an enlarged grid connection with the local distribution network operator (DNO), who are UK Power Networks. The inquiry was for a 650kVA connection, which appears to replace the current 100kVA connection rather than adding to it. 650kVA was the figure given previously for the worst case charging for a fully electric fleet, with load balancing / smart charging in place (on top of the current connection. Indications were that a budget amount of £140,000 would be required). However, with the addition of the food waste vehicles and inclusion of existing energy demands this will need to provisionally increase to 850kVa. UKPN have indicated that an 800kVA connection would require an additional £5,000 budget estimate (or £145,000) due to the larger transformer. It appears that a connection over 1,000kVA would need a further network referral, but should still be possible at greater cost as the nearest substation, located on St. Peters Road, currently still has significant headroom of 15MW (UKPN Opendata Maps). It may still be possible to operate a fully electric fleet with the smaller (650kVA) grid connection, however, this would require battery storage adding at a later stage of implementation as large numbers of vehicles are added to the fleet, to store power available from the connection during the day when vehicles are not charging. If this is necessary, leaving expenditure on battery storage to later in the replacement programme would be most cost effective, because battery prices continue to fall as technology and production improves. However, it is unlikely to be more cost effective than a larger (800-850kVA) grid connection.

When upgrading the grid connection, consideration should also be given to future non-fleet demands for power (such as that created by a transition to heat pumps), and allowances made for any likely fleet expansion. It is generally more cost effective to avoid multiple upgrades and rather make provision for all likely development.

If approaching UKPN -the local distribution network operator (DNO) for the upgrade, then there would a monthly cost for each kVA capacity that is obtained. The latest rate per kVA paid by HDC concerning the current connection was £1.70 per kVA per month. Adding 750kVA would equate to £15,300 a year at this rate.

It is possible to secure capacity and avoid such charges by arranging grid upgrades through an independent distribution network operator (iDNO), through paying a lump sum. In this case, capacity can be secured in advance without the monthly charge, due to a differing legislative framework. These factors should be considered in costing any upgrade. Quite often, suppliers will offer a package of grid upgrade, charging infrastructure installation and financing of the project if desired.

It is very important that HDC moves rapidly to secure the necessary grid capacity for a future electrified fleet and meet any other site development needs. This is because capacity is allocated on a ‘first come first served’ basis and if a substation runs out of capacity the time, procedures and complications to subsequently upgrade remaining locations increase substantially, to the point where projects can be delayed by several years.

### EVCI Costings and Timing

HDC made an enquiry to the local DNO for the provision of a budget estimate for the upgrade of the site grid connection. The initial enquiry was requesting an upgrade to a 650kVA connection, which is the total estimated peak capacity demand of a fully electric fleet. However, this figure did not make an allowance to also include the existing 100kVA connection and also did not take into account the likely future demand from future electric food waste collection vehicles.

The budget allocation recommended for a 650kVA was £140,000, that is subject to a number of assumptions. We have had subsequent communication with the DNO that confirms the cost of an upgrade to an 800kVA connection should be expected to be an additional £5,000 (Total £145,000). This would be sufficient for a fully electric fleet, based on overnight AC charging in current circumstances and no increases in power demand from other elements of the site.

There may be additional costs associated with UKPN's assumption that HDC *"…will carry out, at no charge to UK Power Networks, all the civil works within the site boundary, including substation bases, substation buildings where applicable and the excavation/reinstatement of cable trenches".* However, the extent to which this is necessary (over and above the current set up) is not yet known without details from the quote. The substation described is more likely to resemble a large cabinet, than a 'building', which effectively replaces the existing transformer / cabinet. Therefore, it would be wise to allow for a contingency along these lines for a base and cable work.

We would suggest an additional £50,000 offers significant contingency, giving a total £200,000 allowance for the connection upgrade budget. Indications of costs for trenches can be observed by setting parameters in the calculator below.

If higher power DC charging was to be considered then a bigger connection would be needed. However, it was not possible to confirm an estimate for a connection as large as 1,000kVA because this would require a 'network referral'. It is also not our view that DC charging is necessary on the site. There are lots of sites locally where this kind of charger could be used externally as a contingency for all but the largest vehicles on the fleet and we expect HGV compatible facilities to emerge in time.

### Process for grid upgrade

HDC should aim for the full requirement of the grid connection upgrade to take place as soon as possible. The presence of available grid capacity is a favourable outcome for HDC.

The process is:

- HDC apply to UKPN for a formal quote for the upgrade (duration determined by HDC). There is usually a fee associated with this which is deducted if the work goes ahead. This also reserves the grid capacity if available pending a decision on the works.
- The quote is given by UKPN (it is suggested in UKPN literature that this will take up to 25 working days). We would expect this to outline any other works HDC are responsible for within the process.
- HDC then accept the quote and instruct the work to take place (duration determined by HDC)
- We then would expect the works to be completed within 12 months in line with the letter provided, although there is a strong suggestion on the UKPN website that works could take place within 26 weeks of acceptance of the quote.

**This would mean that the process should take around 7 to 15 months from start to finish,** assuming HDC administration or finance does not cause any additional delays.

### Costs of Chargers, Civils costs estimates

After the initial cost of upgrading the grid connection, it is important to install the wiring needed for the whole site accommodate electric vehicle charging in all parking locations. This is a process best undertaken only once, to avoid repeated disruption and duplicated costs.

It may not be necessary to install all the chargepoints at this stage, as these can be installed as and when new electric vehicles are ordered. Locations of chargers and blanking plates will be needed at the same time as the initial wiring install. It is also important to ensure that sufficient load balancing equipment is in place and that all chargepoints are compatible with this approach.

Charge points vary in cost. HDC will require a mix of 7kW and 22kW outputs. It may be possible to split some of the 7kW units between two vehicles. The 22kW units are what is required for eRCVs and heavy vehicles and this is not beneficial to split, due to the high energy

needs of these vehicles. However when electric food waste collection vehicles arrive in 2032, these will need to be 22kW chargers split to two 11kW outlets.
Cost allocation should also be made for load balancing.
Energy Saving Trust have worked with many chargepoint projects and Table 9-2 is a summary of conservative values from many datasets. It should be noted that HDC will require smart charging and the ability for points to be compatible with load management software to ensure that in the long run, the connection size that is required is minimised. These figures may over-estimate many costs, especially if multiple points are procured in one action.

***Table 23-2*** *Generic costs of different charge points (conservative estimates based on EST project datasets)*

| Chargepoint | Cost | Installation | Civils, signage and other | Total | Number needed |
|---|---|---|---|---|---|
| 7 kW Charger | £3,000 | £3,500 | £2,500 | £9,000 | Up to 63 |
| 22kW Charger | £5,000 | £4,500 | £3,000 | £12,500 | 31 (inc 6 2*11kW) |
| 50kWh (for comparison) | £24,500 | £11,000 | £3,500 | £39,000 | 0 |

7 kW chargers are not needed for all vehicles. Low usage vehicles can charge on alternate nights or even share a 7kW feed (3.5kW each). This means that in practice closer to 45 points would be needed (giving a total of around £400,000).
Dedicated 22kW single point chargers are needed for all 26 of the eRCVs. It seems a further six 22kW charge points could be shared by food waste vehicles – at 11kW a feed (not expected until 2033). This would mean total costs of a further £400,000, although it will take some years to realise the full extent of the costs (this will be front loaded by civils costs).
If more specific estimates need to be made, and costs broken down, then the Government sponsored Battery Electric Truck Trial offer guidance on costs. These are also summarised below and a calculator is provided to work out a guide price to ensure any quotes given are within the range of these guidance costs.

***Table 23-3*** *BETT Guidance on installation costs*

| Item | Cost | Comments |
|---|---|---|
| Excavations: Turf | Up to £120 per metre | Possible to consider around perimeter of site to reduce costs / disruption |
| Excavations: Pavement | Up to £200 per metre | Unlikely to be needed |
| Excavations: Road | £250 per metre | Expect most to be needed under parking area – equivalent to road |
| Electrical Cabling | Up to £50 a metre | Amount needed depends on layout |
| Earthing | £300-£500 per pit | Not needed with all charging units |
| MCB, RCBO, RCD protection | £250 per charger | Needed for each charger |
| Protective Barriers | £200-£300 per bay | Likely to be needed with each charger |

Many of these costs form part of the totals assumed in **Table 23-2**. However, when the meterage of excavation types and cables are known, this could be useful to calculate a more specific guide for costings. We have provided an infrastructure cost calculator that can be set to work out a guidance for likely electrification project costs. All orange squares can be edited to the required specifications.

*Figure 23-1 - Calculator for infrastructure spend based on BETT guidance*

| | |
|---|---|
| Turf Excavation (metres) | 10 |
| Pavement Excavation (metres) | 0 |
| Road Excavation (metres) | 100 |
| Total Distance of cable (metres) | 110 |
| Cost of cables/ excavations | £26,200 |
| 7 kW Charger unit cost (£) | £2,400 |
| 7 kW Install cost per unit (£) | £3,000 |
| 7 kW Charger (Quantity) | 20 |
| 22 kW Charger unit Cost (£) | £0 |
| 22 kW Install cost per unit | £0 |
| 22 kW Charger (Quantity) | 0 |
| Protective Barriers (Quantity) | 20 |
| Earthing Pits (Quantity) | 20 |
| MCB,RCBO, RCD Protection (Qty) | 20 |
| Total Cost | £152,200 |

## Timeline for chargers / costs

Without clarity of specific site-based quotes and detailed surveys, it is only possible to estimate the distribution of expenditure across the financial years. The expenditure will inevitably be front loaded with grid connection, civils, and trunking and locating/blanking plates for all future charge points best installed at the same time. We have assumed around two thirds of this will be required in advance. Better estimates of price can be achieved through quotes and use of the calculator in Figure 23-1.

Subsequent expenditure on charging units themselves, final install stage, signage and protection will be required in advance of each year's programme of vehicles arriving. All charge units will need to be smart and capable of working with a load balance system, which would not be strictly necessary until the total demand that chargers create could exceed the upgraded grid connection size. However, it may be wise to prepare from the start for this situation. Any of these could be procured further in advance. The timetable is a guide to ensure charging is in place for vehicles as they are ordered.

***Table 23-4** Timetable of requirements and worst-case scenario costs*

| Financial Year | Item (s) | Outline cost / provisional budget amount |
|---|---|---|
| 2025/26 | Grid Upgrade to 800/850kVA | £150,000 |
| | Grid upgrade ancilliaries, items not in DNO quote – such as cabinet base, etc | £50,000 |
| | 1* 22kW charger, installed (can be done on current connection with timer) | £12,500 |
| | 7* 7 Kw Chargers installed (can be done on current connection with timer) | £63,000 |
| 2026/27 | All trunking, charger locations install ready with blanking plates for future fully electric fleet | £324,000^ |
| | Provision for load balancing (maybe possible at a later stage) | TBC |

| Financial Year | Item (s) | Outline cost / provisional budget amount |
|---|---|---|
| | 1*22kW charger (needs 800kVA grid connection to be complete) plus final install / protection/barriers, etc | £7,500 |
| | 22*7kW charger (needs 800kVA grid connection to be complete) plus final install / protection/barriers, etc | £110,000 |
| 2027/28 | 6*22kW chargers | £45,000 |
| | 8*7kW chargers | £40,000 |
| 2028/29 | 4*22kW chargers | £30,000 |
| | 2*7kW chargers | £10,000 |
| 2029/30 | 5*22kW chargers | £37,500 |
| | 12*7kW chargers **May not be needed if alternate day charging is achieved and proven effective in for low use vehicles* | £60,000* or zero |
| 2030/31 | 4*22kW chargers | £30,000 |
| | 1*7kW chargers **May not be needed if alternate day charging is achieved and proven effective in for low use vehicles* | £5,000* or zero |
| 2031/32 | 6*22kW Charger, including one with 2 outlets (11kW) | £45,000 |
| 2032/33 | 3*22kW Charger | £22,500 |
| | 5*22kW Charger with 2 outlets (10*11kW) | £37,500 |
| 2033/34 | 1*22kW Charger | £7,500 |
| | 5*7kW Chargers | £25,000 |
| Beyond | A further 7 vehicles will require 7kW charging, although this may well be achievable through sharing of existing outlets. | Up to £35,000 – may be zero. |

^ We expect this to be a significant over-estimate (worst case scenario) - if an efficient trunking arrangement can be made – pricing will then be possible to calculate in line with **Figure 23-1**. These costings may be subject to inflation and market fluctuations. Improved technology could well deliver much more cost-effective solutions as time goes on. Grants may or may not be available to assist with these costings depending on policy at the time.

### Alternative path using an iDNO

Using the DNO in the way described above to undertake the project is the most prominent option. However, it is possible to use an independent distribution network operator (iDNO) to undertake what are described as 'contestable' works (the build around the connection - substation if needed, civils, ducting, cabling, switchgear etc). Using an iDNO also means that HDC would not be required to pay the DNO 'rental' for the total capacity from day one, which could represent a significant saving.

It should be possible to use an Independent Connection Provider (ICP) – the builder, alongside the iDNO – the distributor, who would work together to provide the grid connection infrastructure whilst lessening the costs associated with the contestable part of the DNO's quote. The ICP would provide their own quote for the contestable works, and the iDNO would provide an asset valuation (lump sum) for taking on ownership of the grid connection.

ICPs can be approached directly for a quote, and they can subcontract to an iDNO of their choice. Whilst this offers some positives, it can sometimes make things happen more slowly.

### EVCI Summary

HDC urgently need to upgrade their grid connection to be able to deliver a fully electric fleet. This is necessary to secure capacity while it is still available locally. An additional 750kVA (total 850kVA) will allow for worst case overnight charging scenario based on AC charging the entire future electric fleet providing this is backed by load balancing and smart charger management. This would be substantially more if rapid DC charging is needed (i.e. each 100kW rapid charger equates to over 100kVA more capacity). If no load management system is employed to connect chargers this would need to be closer to 1,300 kVA, although it is not established yet with UKPN whether such a connection is possible and how much it will cost.

Without a grid upgrade, there is very limited potential to electrify the fleet based on the current connection size, beyond the programme for 2025/26 and 2026/27.

The upgrade is best undertaken as soon as possible in one action to include all other likely future capacity needs for the site. Typically, each RCV needs access to a 22kW AC charger and each other vehicle, a 7.4kW AC charger, or at least one shared between low use vehicles for charging on alternate nights.

Due to the presence of local spare grid capacity, enhancements such as battery storage are unlikely to be essential for future fleet operations but could be of value in terms of reducing unit costs and carbon emissions if generation of electricity exceeds the amount being used on the site.

HDC should not miss the opportunity to upgrade the grid connection and consider whether using an iDNO to assist in this process is more cost effective by means of alternative quote.

## 24. POSSIBLE ALTERNATIVE TO CURRENT DEPOT

HDC currently tip their garden waste at a rural site north of St. Ives which is owned and operated by Envar Composting. Envar have expressed an interest in providing charging for electric vehicles and mooted the possibility of electric refuse vehicles being charged mid-shift or even potentially re-locating some future HDC electric vehicles overnight for charging. Biogas is also suggested as a road fuel that could be produced in this location. We do not consider the limited possibilities for operation of gas powered RCVs to be a viable alternative for a single shift operation at a time when the previous main proponents have moved away to eRCV focused solutions as electrification costs continue to improve.

Currently, we understand that this site has 350kW of shed-based solar energy generation capacity. There are also plans for the installation of over 1 MW of solar energy generation capacity. The source of generation of electricity overnight is not yet clear, albeit possibly from burning gas that the site generates from anaerobic digestion. The alternative would be battery storage of solar energy.

The option of charging in an alternative location may be attractive if there were grid capacity restrictions on the HDC depot and no clear path to resolve these. However, as there is a clear pathway to a fully electric depot using an alternative location offers limited benefit and could introduce different risks and opportunities.

Key considerations surrounding this include:

- Daytime charging would only be partial. It would need to be rapid and would only suit vehicles tipping in this location. There would be a cost in terms of driver time, as they wait for vehicles to charge. This would be unlikely to meet any vehicles whole energy demand as most products do not facilitate rapid enough charging to fully charge in less than two hours. Rapid charging is also not always good for long term battery durability.
- Operational effects – how much would this location affect route distances and mileage if used as an overnight base or a base for charging other vehicles – if this increases them (very likely) then there would be both a cost and potential effect on the range needed from electric vehicles. It is possible that some routes may reduce mileage if garden waste is tipped at the end of a shift. How a transition from diesel and workshop facilities fit would also need to be managed carefully, something that would not be a concern at the current depot.
- Overnight charging away from the HDC depot would introduce the following concerns
    - Lack of control over security of vehicles
    - Change of 'workplace' base for employees, need for their commuting/parking arrangements to change. If the location is rural, sustainable commuting may be less achievable and costs for some employees may increase.
- Costs – HDC would be subject to one supplier if using overnight charging – a competitive rate would need to be negotiated over a prolonged period. However, if there was no development of the HDC depot, and the fleet electrifies dependent on third party charging provision, there will be a point at which HDC are very vulnerable in future negotiations.
- Carbon intensity – it is essential that carbon intensity of electricity generated is known and that it is guaranteed to be able to remain at a rate below that provided by the grid, otherwise decarbonisation will not be achieved. Non -independent indications from the supplier are that the electricity generated on the site is likely to be of a lower carbon intensity than the grid due to GHG emissions avoided elsewhere through the production of biogas and fertiliser pellets. However, this would need to be verified to HDC's satisfaction.

The realistic outcome is that there may be two main potential opportunities to investigate in terms of working with this supplier.

1) Use for high voltage top up charging for EVs that are tipping in this location (marginal benefit)

- This could only be partial and comes at a time cost.
- Would need to be at a competitive rate to be worthwhile (i.e. close to the cost of power in the depot)
- Could enhance range of vehicles with smaller batteries
- Slightly reduces charging needs at the HDC depot.

2) A virtual Power Purchase Agreement (PPA)

- If the low carbon nature of the electricity can be verified, there may be some value in entering into a virtual PPA if a guaranteed, contracted cost of electricity can be achieved over a contracted period of time.
- This would also require a payment of transmission fees to the grid provider.
- At present this is hypothetical, and the necessary generation is not yet in place to understand what the likely cost and scope of this kind of arrangement would be.

### Conclusion

There may be limited opportunities from this potential collaboration, and these will be most useful in the latter stages of the vehicle electrification when energy consumption is nearing its peak. It may be worth holding discussions on PPA and top up charging in future.

However, the relocation of vehicles does not appear to be a viable option, given the ease of availability of a grid connection upgrade at Eastfield House and other risks this approach would bring.

## 25. MAXIMISING THE BENEFITS OF AN ERCV TRIAL

An extended trial of an eRCV is a helpful step on the journey towards electrification of this fleet. Short term 'demonstrations' (e.g. a week or two) are available from manufacturers trying to sell their products. It is also possible to procure an extended trial, perhaps for several months, by hiring a vehicle from a specialist supplier. For example, Vertellus offers a three month 'Discovery Programme' on electric trucks, which provides loan of charging equipment and significant support to ensure that the best results can be achieved from any trial.

As well as looking at practicalities, any trial should ensure that data is available and comprehensively assessed, internal PR is maximised and that opportunities for external PR are exploited, to maximise value and increase the chances of securing the best outcomes in the future.

### Practicalities

Any questions that operational teams want to answer should be considered up front so that the trial can be best positioned to answer them. This could be if a single charge is capable of completing specific routes, whether the vehicle performs duties to a satisfactory standard and how much charge the vehicle returns with, and practicalities around charging.

### Data

Whilst some practicalities will be tested, they will be most likely to give a yes or no answer. However, data will give much deeper insights into how efficient the vehicle is and what capability the vehicle has beyond the work done that day. Access to vehicle telematics for the duration of the test is essential to maximising the value of the test.

Important attributes to evaluate, that will help further inform the EV transition are:

- Energy consumption – kWh/mile.
- Relationship of energy consumption to mileage / bin lifts.
- Total energy used each day (this will help to align modelled data with reality and assess any differences). This will also highlight how much spare capacity there may be in the battery to allow for degradation in latter stages of the vehicle life.
- Amount of kWh charged (the difference between this and daily use will highlight any charging losses). This will also enable an accurate assessment of costs.
- It will be important to note temperatures on trial days to ensure that this is factored into any thinking.

Efforts should be made to analyse the data in a simple but effective form, so it can be widely understood across the Council.

### Internal PR

It is important to ensure that any trial is brought to the attention of relevant Council members, senior management and budget holders to ensure that maximum buy-in is achieved and that a level of excitement and anticipation can be generated by the positive change it represents.

This should both be prior to the trial, during the trial (physical experience of the vehicle in operation will be very valuable) and also in terms of dissemination of data analysis after the trial.

Additionally, the trial offers an opportunity to show the new technology to drivers and vehicle operatives. Drivers will benefit from a smoother drive and better vehicle performance and operatives will benefit from a quieter and less polluted working environment. Highlighting this can build momentum and enthusiasm for the eventual delivery of wider changes across the fleet and remove a potential obstacle that can sometimes arise in the transition to electric vehicles.

### External PR

A trial may offer the chance to show the public that HDC is serious about decarbonisation and could be a lever to explain the future fleet strategy and show what whole life cost savings may be, alongside future emissions reductions. It also gives council members the chance to demonstrate progress and positivity to constituents.

# APPENDIX A: GLOSSARY OF TERMS

| Abbreviation | Meaning |
|---|---|
| BEV | Battery-electric Vehicle |
| CAZ | Clean Air Zone (England and Wales, excluding London) |
| CCC | UK Committee on Climate Change |
| CNG | Compressed Natural Gas - methane ($CH_4$) |
| DBEIS/BEIS | (Department for) Business, Energy and Industrial Strategy |
| Defra | Department for Environment Food and Rural Affairs |
| DVLA | Driver and Vehicle Licencing Agency |
| DVSA | Driver and Vehicle Standards Agency |
| EV | Electric Vehicle - usually battery-powered (BEV) |
| GHG | Greenhouse Gas - in transport usually $CO_2$, $CH_4$ and $N_2O$ |
| GVW | Gross Vehicle Weight – Replace by MAM |
| GWP | Global Warming Potential |
| H2FC | Hydrogen ($H_2$) Fuel Cell |
| HCV | Heavy Commercial Vehicle – also known as HGV – over 3.5t MAM |
| HGV | Heavy Goods Vehicle – also known as HCV – over 3.5t MAM |
| ICE | Internal Combustion Engine – Petrol/Diesel/Gas |
| LCV | Light Commercial Vehicle – Van – up to 3.5t MAM |
| LNG | Liquid Natural Gas – methane ($CH_4$) |
| LPG | Liquid Petroleum Gas – propane ($C_3H_8$) or butane ($C_4H_{10}$) |
| MAM | Maximum Authorised Mass – replaces GVW Gross Vehicle Weight. |
| NAEI | National Atmospheric Emissions Inventory – Transport Factors |
| NCAP | New Car Assessment Programme - Safety |
| NEDC | New European Driving Cycle (now replaced by WLTP) |
| NG | Natural Gas – methane ($CH_4$) |
| OEM | Original Equipment Manufacturer, e.g. Ford, Nissan, Toyota etc. |
| OZEV | Office of Zero Emission Vehicles |
| PHEV | Plug-in Hybrid Electric Vehicle |
| PM | Particulate Matter – associated with wide range of human illness |
| RDE | Real Driving Emissions (RDE1 and RDE2) |
| TTW | Tank to Wheel |
| ULEV | Ultra-Low Emission Vehicle |
| ULEZ | Ultra-Low Emission Zone (London only) |
| V2G | Vehicle to Grid – Technical Guidance (UK Power Networks) |
| VCA | Vehicle Certification Agency |
| VED | Vehicle Excise Duty – also called Vehicle Tax. |
| VRM | Vehicle Registration Mark |
| WLC | Whole Life Cost |
| WLTP | Worldwide Harmonised Light Vehicle Test Procedure |
| WRI | World Resources Institute – GHG Protocol |
| WTT | Well to Tank |
| WTW | Well to Wheel |
| ZEZ | Zero Emission Zone (TfL and Mayor of London Guidance) |