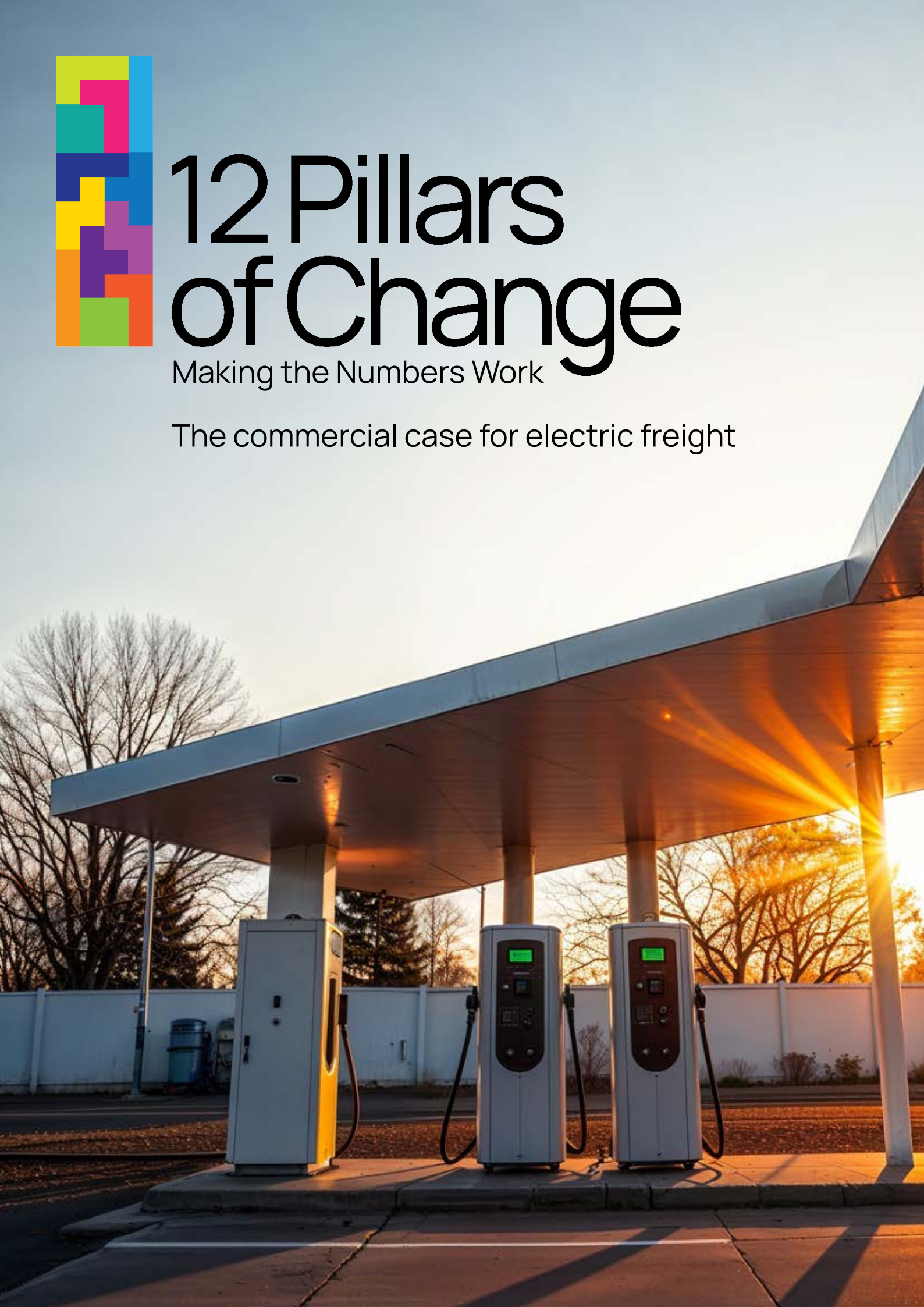
12 Pillars of Change

Making the Numbers Work

The commercial case for electric freight



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Foreword

The freight industry is being asked to make the biggest capital investment in its history, and most operators are making decisions based on incomplete information, contradictory advice, and sales pitches dressed up as evidence. That's why TwentyForty created 12 Pillars of Change. Not another conference. Not another white paper telling operators what they should do. A programme designed to produce honest, practical answers to the questions that determine how to make electrification work.

This report is the output of the first workshop, held on 27th March 2026. We put fleet operators at different stages of electrification in the same room as a truck financier, an insurance specialist, an energy supplier, charging infrastructure providers, and an OEM representative. We asked one question: do the numbers work? This report is what they said. Where the room agreed, we say so. Where they disagreed, we present both sides and say which has stronger evidence. Where nobody had the answer, we say that too.

It's written for the operator who hasn't bought their first electric truck yet and wants to know what they're walking into. It's for the policy maker who thinks the current grant structure is doing its job. It's for the OEM that hasn't worked out how to serve the second-hand market. And it's for the energy and finance sectors that haven't yet made this simple enough for a business running on 3% margins to say yes.

I work for a family haulier that's been moving freight for ninety years. We've bought electric trucks with every generation of grant funding and watched the economics shift in real time. What I can tell you is that the commercial case is closer than most people think, but further away than the headlines suggest. The detail matters. This report is the detail.

Executive Summary

The sticker price gap is closing fast. Grant-supported tractor units are leasing at diesel-equivalent rates. Chinese manufacturers are offering chassis that undercut European OEMs by a third. Diesel-to-electric refurbishment is opening a cheaper route in for capital-constrained operators. But the grant structure favours large operators placing volume orders. Over half of UK HGVs sit in fleets of 10 or fewer, and there's no ring-fencing to protect their access. If SMEs can't join the transition, it doesn't happen.

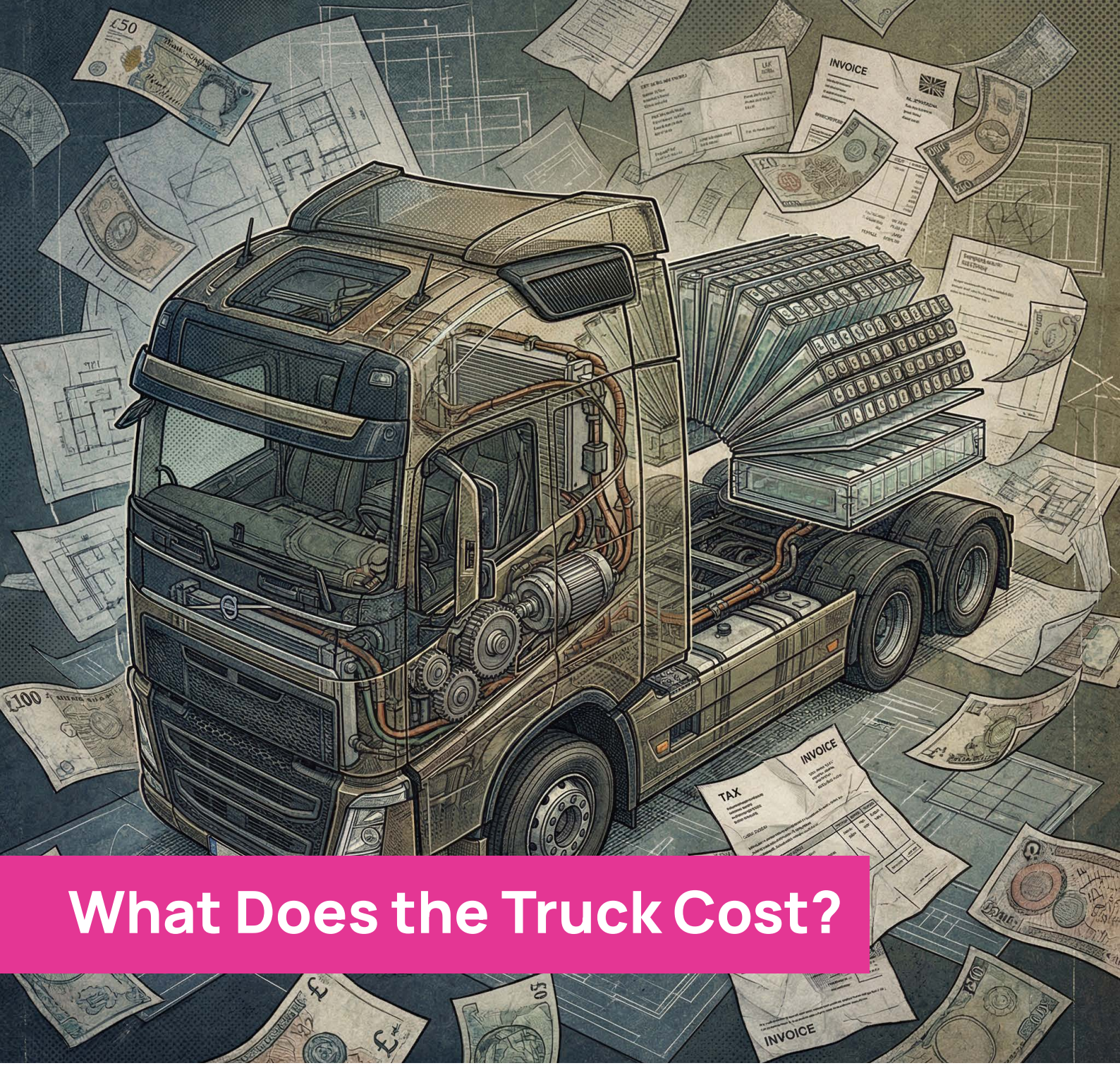
The energy floor is real and it isn't moving. Delivered power in Northern Europe won't fall below 20p/kWh. Operators should model on 18-20p as their base case. At those prices, electric trucks are still 15-25% cheaper to run than diesel. The TCO case is most defensible with predominantly depot charging. Long-haul operations that rely heavily on public charging can still make the numbers work, but only with scale, utilisation, and the right pricing strategy.

Depot power is the binding constraint. Over 100 trials confirmed that virtually no operator has enough grid capacity. Connections cost £5,000 to £5 million and take up to three years. The Depot Charging Scheme still doesn't cover DNO upgrade costs, which is the single biggest infrastructure expense most operators face.

Insurance and residual values are hidden blockers. Operators report no premium difference, but EV claims inflation runs at 25% versus 10% for general motor, and insurers are writing off repairable vehicles. On residual values, there is no used-market for electric trucks in the UK. Finance providers are pricing blind. A government-backed Residual Value Guarantee has been designed, modelled, and published. It remains unimplemented.

The ownership model is shifting from 5-year replacement cycles to 15-20 year vehicle life. Multiple operators independently described plans to run electric trucks for a decade, refit batteries, and run them for another decade. The bus sector validates this with 14-year warranties and fleets running nine years without a single cell failure. No published study has modelled this scenario for trucks. If it becomes the norm, it changes the finance case, the residual value picture, the OEM business model, and the number of trucks the industry needs to buy.

The biggest risk is that 70% of the industry isn't paying attention. UK electric HGV registrations sit at roughly 1%, against 4.5% in Germany and 14% in the Netherlands. The commercial case is real and getting stronger. But it only matters if the operators who need to act actually hear it.



What Does the Truck Cost?

The sticker price gap is closing faster than most of the industry realises. Five years ago, an 18-tonne electric rigid cost nearly £300,000. Today, grant-supported tractor units are leasing at diesel-equivalent rates, and Chinese manufacturers are offering chassis at prices that undercut European OEMs by a third or more.

Diesel-to-electric refurbishment is emerging as a potentially cheaper route in. Baseline quotes for an 18-tonne curtain sider are landing around £110,000, with part-exchange arrangements bringing that materially lower. For capital-constrained operators, it could change the entry point entirely.

Current grant design favours operators who are already electrifying. Without caps or ring-fencing, the latest funding risks being absorbed by large fleets placing volume orders, leaving SMEs locked out of the transition they most need help starting.

> We paid almost £300,000 for it. 130 mile range. As you can imagine, that was quite a tough sell.

That was five years ago. Today, a 42-tonne electric tractor unit offers twice the real-world range at a fraction of the cost. Grant-supported tractor units are leasing at diesel-equivalent monthly rates. The price story is what matters for operators trying to build a business case, and it's moved faster than most of the industry realises.

The trajectory is worth spelling out. The ZEHID programme funded vehicles at around 80% of their value. That wasn't designed to achieve diesel parity. It was an innovation programme to get trucks on the road and prove the technology in UK operations. Under that model, vehicles were materially cheaper to run than diesel equivalents.

The general-access Plug-in Truck Grant tells a separate story. On 6 January 2026, an £18 million uplift raised the headline cap to £120,000 for vehicles over 26 tonnes. That enhanced rate ran for just under three months. On 25 March 2026, two days before this workshop, the government announced a £1 billion package that reduced the grant to up to £81,000 per tractor unit, or 40% of vehicle value, whichever is lower.

Even at the reduced £81,000 level, combined with improved OEM residual value positions and better finance rates, the economics land at approximate diesel parity on monthly lease costs. Since ZEHID, public support available to operators has more than halved, yet the commercial proposition has held. That's real movement in the underlying economics, not just the grant masking the gap. The money is now flowing. The question is who it flows to.

Where the prices are heading

The workshop heard evidence that the price trajectory has further to run. Battery packs account for up to 60% of total eHGV capital cost, and pack prices continue to fall. Volume-weighted average lithium-ion pack prices hit around $108/kWh in 2025, down from $148/kWh just two years earlier, with forecasts pointing to $69/kWh by 2030. At those levels, the battery for a 500kWh tractor unit pack would cost roughly $35,000 in manufacturing terms. That fundamentally changes the sticker price equation.

But the most disruptive force on pricing isn't the established OEMs. It's China.

One operator tested a Chinese-built tractor unit at their depot and described it in terms that bear repeating.

> It was a colossal bit of kit. 700 kilometre range. 1,400 brake horsepower. I've never driven anything so powerful in my life.

That vehicle was plated for 49 tonnes and had been tested to 69 tonnes pulling road trains in Australia. Its UK price point: approximately £220,000. That's competitive TCO with diesel tractor units, without any grant. When asked about chassis costs excluding the battery, a Chinese manufacturer quoted £65,000-£70,000 for a 4x2 chassis, adding that they'd make double their domestic margin at those prices.

The point isn't one particular truck. It's the direction of travel. European OEMs are offering capable vehicles at prices that work with grant support. Chinese manufacturers are offering vehicles at prices that might work without it.

The refurbishment route

There's a parallel path that most operators haven't considered. Several companies are now converting diesel trucks to electric by replacing axles and key drivetrain components. Because the vehicle is reclassified as new after conversion, it can attract the same grant as a factory-built electric truck.

> I reckon I can get a refurb for about 70k. It's new where it matters. The steel chassis, as long as it's not rusted through, it doesn't make any difference.

The logic is simple. A steel chassis, if it's structurally sound, is functionally identical whether it's two years old or ten. What matters is the drivetrain, the battery, and the electrical systems, and those are all new. For a young, capital-constrained business, this is a fundamentally different entry point than a £250,000 new vehicle. Companies active in this space include bus conversion specialists now handling 12 vehicles at a time, and refuse vehicle converters expanding into general haulage applications.

Academic research on last-mile fleets confirms that retrofitting is already an established approach in delivery operations, where companies have used electric drivetrain conversions to mitigate upfront costs. The truck sector is now following the same path.

The SME problem

Here's where the pricing story turns from encouraging to concerning.

The UK has roughly 60,000 road freight enterprises. Over half of all HGVs are in fleets of 10 or fewer. Profit margins run at 2-4%. These operators typically buy outright with cash reserves rather than using leasing or finance products. They keep vehicles for 12 years on average. And the current grant structure isn't built for them.

There was real frustration in the room that the latest funding could be absorbed entirely by large operators placing volume orders. Government hasn't placed caps or ring-fencing to protect SME access. One operator captured the tension precisely.

> "It's favouring people that are already there. My selfish brain is like, that's fine, because we're one of the ones that can take advantage of it. But it's not how you get the industry to shift.

The consensus was pointed: large operators placing hundred-vehicle orders arguably have the balance sheets to bear decarbonisation costs themselves. Grant funding should be targeted at those who genuinely can't bridge the gap. Without that targeting, government risks accelerating the leaders while the rest of the industry watches from the sidelines.

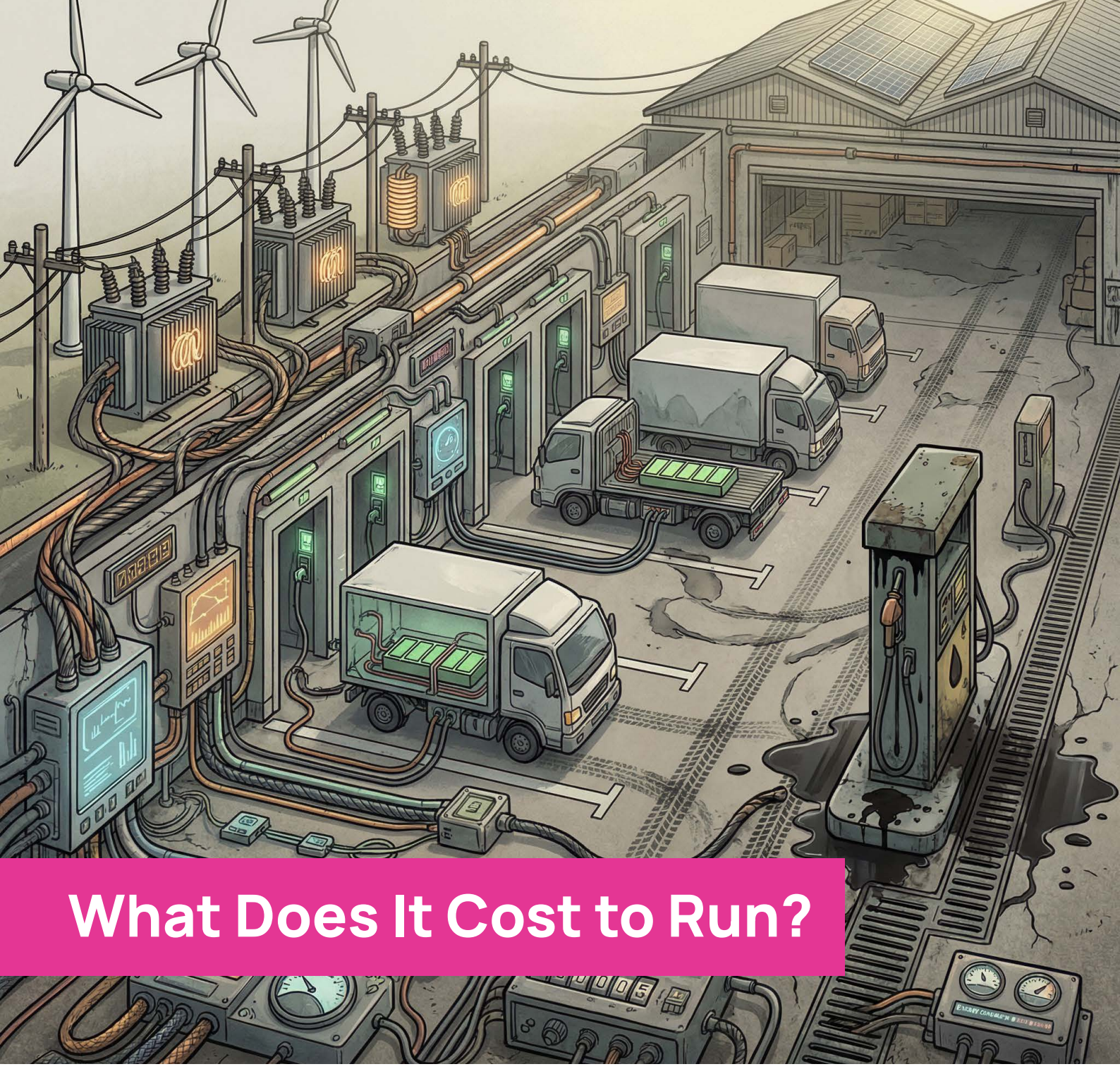
Volume discounts and demand aggregation

The workshop debated whether volume discounts are real or a red herring. HGV manufacturing isn't consumer electronics. Electric trucks go down the same production line as diesel, with only a separate battery section. Ordering 120 instead of 20 doesn't unlock a new line. One view was that the "discount" is really the OEM accepting lower margin, not recovering costs more efficiently. The counter-argument: factories building five electric trucks a week do carry higher per-unit costs than those building fifty, through training, tooling, and equipment overhead.

The more productive idea was demand aggregation. Bringing 20-30 SMEs together to place a collective order and negotiate as a group. This was seen as far more aligned with how the sector already works. Pallet networks, trade associations, and buying groups are familiar structures. Research into operator preferences confirms this instinct: aggregated purchasing is seen as valuable in theory, but impractical to coordinate without a dedicated third party handling tendering for the group.

The operator view was direct: concessional finance with transparent terms is what they want. When asked to rank purchasing models, operators put straightforward finance with lower interest rates and guaranteed residual values at the top. Full-service vehicle-as-a-service models ranked last, rejected on grounds of contractual lock-in, loss of control, and cost opacity. In a sector running on 2-4% margins, bundled services with poor pricing transparency were viewed as unviable.

Academic TCO analyses consistently identify high purchase price as the primary barrier for smaller operators, with battery costs forming the largest component. Research also confirms that government subsidies are more important than technical efficiency gains for near-term competitiveness. One study found that reducing the EV purchase bonus by just €3,000 was enough to swing TCO back in diesel's favour, quantifying just how sensitive the business case remains to grant levels.



What Does It Cost to Run?

The floor price for delivered power in Northern Europe is around 20p/kWh. It isn't going lower. Operators should model on 18-20p/kWh as their base case, not hope for cheaper. Current market rates of 23-26p/kWh are palatable and leave a manageable margin above the floor.

Electric trucks are 15-25% cheaper to run than diesel today, and the gap is widening. This advantage holds even at current energy prices, driven by fuel cost savings and lower maintenance. The economics are most defensible with predominantly depot charging, but long-haul operations that depend on public charging can still close the gap if utilisation is high and pricing is structured for committed volume.

Maintenance savings are real and immediate. No AdBlue, no DPF regeneration, fewer moving parts. Operators are reporting significantly lower workshop costs and less downtime. But tyre wear runs higher, and the technician skills gap is a growing cost risk.

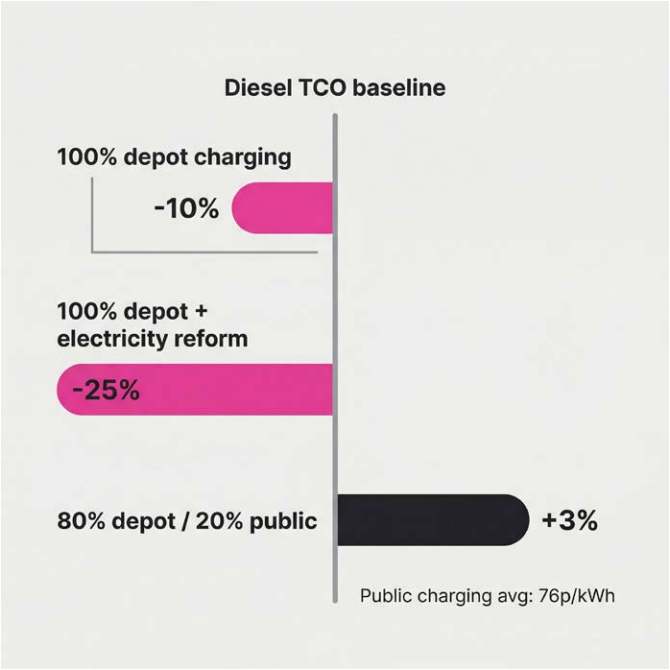
The energy floor

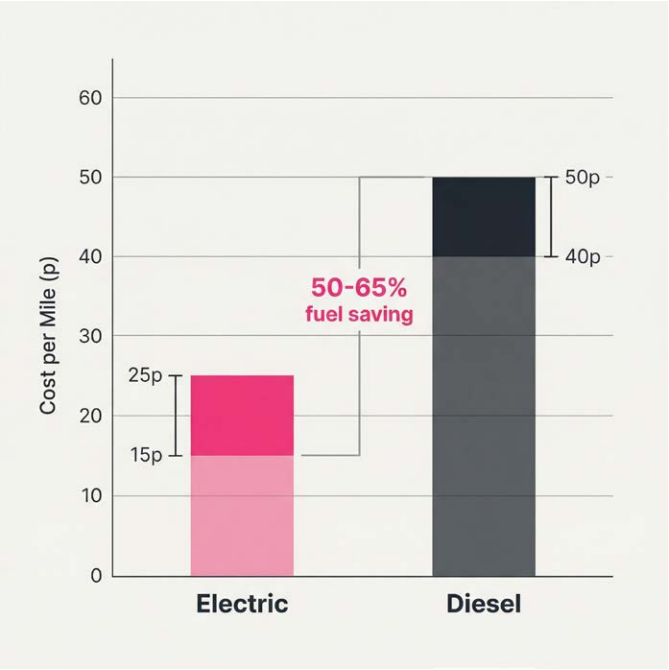
The most useful number in this report for any operator building a spreadsheet came from the energy supplier in the room. Their assessment was blunt: there is no foreseeable future in which power in Northern Europe costs less than 20p per kilowatt hour on a full-cost basis.

> I see no future where power in Northern Europe is less than 20p a kilowatt hour on a full-cost basis.

The maths behind this is straightforward. The lowest credible UK levelised cost of energy, covering generation plus balancing, is approximately 12p/kWh. Add distribution costs of roughly 7p/kWh and you reach 18-20p before any charger or connection costs. The UK is a wind-dominated grid, not a solar market. When the wind isn't blowing, the marginal generator is gas at roughly £200/MWh. That sets a structural price floor that government intervention on electricity-gas price linkage won't meaningfully change.

Current published data supports this. DESNZ figures from December 2025 put manufacturing sector rates at 16.5p/kWh excluding the Climate Change Levy, with non-domestic averages at 23.8p/kWh including levies. A fleet depot consuming 500,000+ kWh per year on half-hourly metering is likely paying 20-28p/kWh depending on contract, region, and time-of-use profile. Off-peak depot charging can get down to 15-18p/kWh, but daytime peak rates run 25-35p. That 40-50% differential makes overnight charging operationally essential, not optional.





The running cost advantage

The good news: even at these energy prices, electric trucks are cheaper to run than diesel. One operator reported a 15% running cost advantage over diesel in late February 2026, rising to 25% by March, with capital and charging infrastructure costs excluded. Fuel cost alone tells the story: an electric truck running at 20p/kWh costs roughly 15-25p per mile in energy, compared with 40-50p per mile for diesel. That's a 50-65% fuel saving.

But this advantage hinges on where the electricity comes from. An industry TCO model shows that an electric HGV doing 125,000 miles per year with 100% depot charging has a total cost of ownership 10% below its diesel equivalent. With electricity policy cost reform, the gap widens to 25%. Shift to an 80/20 depot-to-public charging split at current public charging rates (averaging around 76p/kWh) and that same truck's TCO lands 3% above diesel.

The 80/20 figure is an average that hides what's really happening. The data doesn't cluster around one point. It splits into two distinct operational profiles. Short-haul, back-to-base operations that almost never public charge, and long-haul operations that almost always do.

For long-haul, the public charging rate is the variable that determines whether the economics work. At Zapmap's 76p average, they don't. At committed-volume rates closer to 50p/kWh, which are achievable at well-utilised commercial hubs, the picture changes substantially. Two-thirds of UK HGV emissions sit with operators who can't electrify until charging exists away from base. Solving that isn't optional. It's the next phase of the transition, and it depends on hubs being built at the right scale, in the right locations, with pricing that reflects committed commercial demand rather than retail spot rates.

The scale of what's at stake is worth stating. The UK truck industry burns roughly £26 billion in fuel every year. That figure stays roughly flat year on year. Investment in renewable generation and charging infrastructure is spent once and then delivers returns for decades.

The economics of the transition aren't just about individual fleet TCO. They're about whether the sector keeps haemorrhaging capital on a volatile commodity or shifts to a more predictable cost base.

The rooftop solar question

Solar generation on warehouse roofs drew sharp disagreement. One participant dismissed it as pointless for truck charging, arguing the output is trivial against the demand of even a single truck, export rates are poor, and it reduces grid demand in a way that makes it harder to spread fixed network costs.

The counter-view: less than 10% of distribution centre rooftops are currently covered, and many existing installations aren't connected because DNOs won't allow export. At scale, with virtual sleeving between sites on the same account, solar becomes part of the energy mix. It's not the answer on its own, but dismissing it entirely ignores a practical point that surprised some in the room: operators with multiple sites can spill solar generation from one to offset consumption at another, avoiding export at 4.2p and instead displacing purchases at 22p. Most operators don't know this is possible.

Solar won't power a truck fleet. But it can shave the top off a depot's energy bill, and that margin matters in a 2-4% profit sector.

Maintenance and operational savings

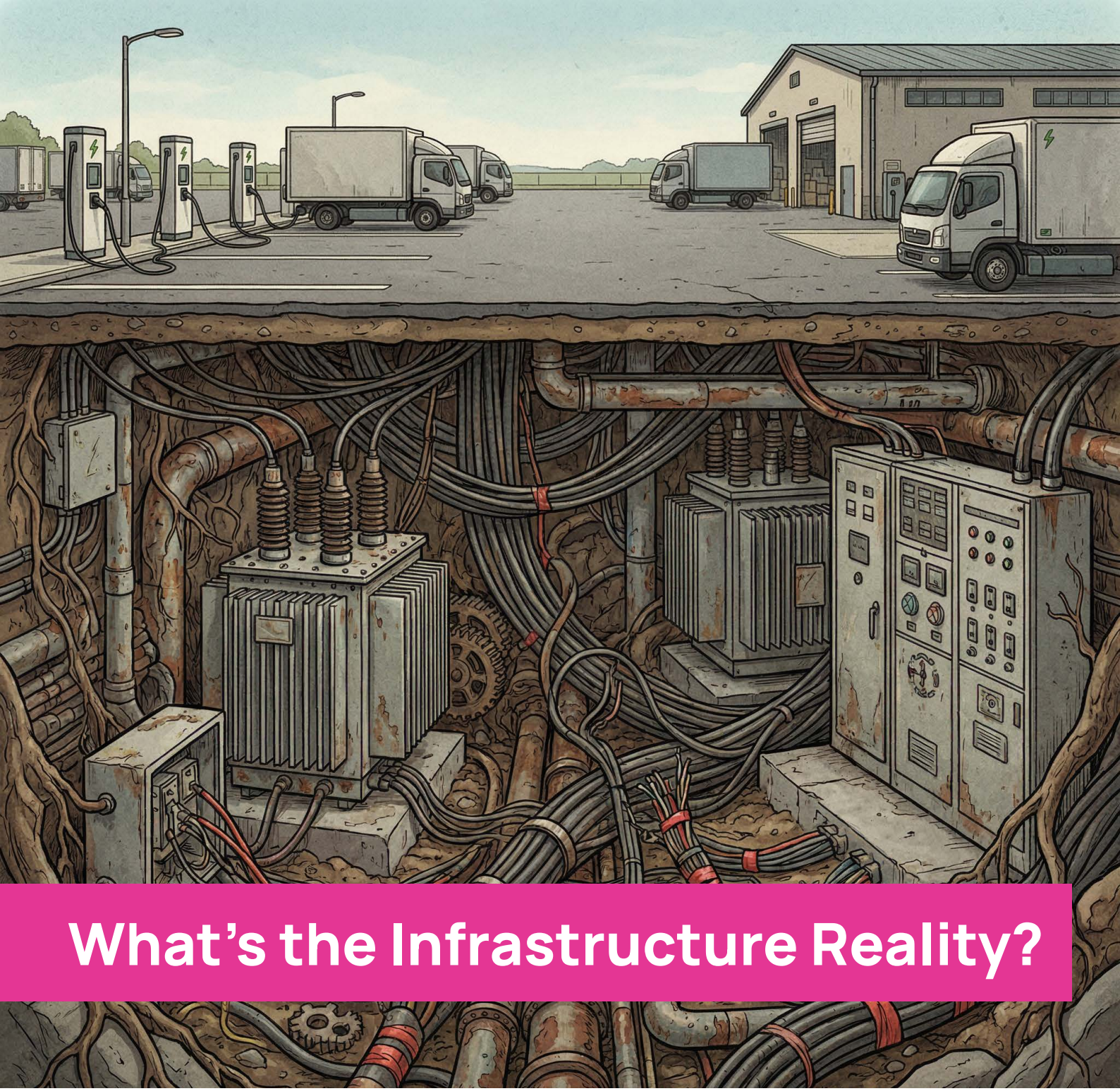
The running cost case extends well beyond fuel. Electric trucks eliminate AdBlue, DPF regeneration, and much of the drivetrain maintenance that keeps diesel workshops busy.

> I've just had a four and a half grand bill for two vehicles for AdBlue crystallisation. I'm not going to have that on electric.

European modelling puts electric truck maintenance at 28-33% below diesel for long-haul and regional operations. UK bus sector data is even more striking, with electric bus maintenance costs running almost 50% lower than diesel equivalents. Operators in the room described needing fewer technicians, trained to a higher standard, paid more. The maintenance workload is fundamentally different.

But it isn't all upside. EV tyres wear up to 20% faster due to additional vehicle weight and higher instantaneous torque, a finding confirmed by both tyre manufacturers and early US drayage operators running electric trucks. And the technician skills gap is a real constraint: only around 25% of UK vehicle technicians are currently EV-qualified, with an estimated shortage of 16,000 EV-qualified mechanics by 2032. Large operators can build in-house capability. Smaller ones face a market where specialist labour is scarce and expensive.

Academic research on urban freight fleets found that driver costs dominate total fleet cost of ownership at 60-90%, depending on vehicle type and operation. This reframes the energy debate. Fuel and maintenance savings from electrification are real and worth pursuing, but they're percentage-point improvements within a cost structure overwhelmingly driven by labour. For operators weighing the transition, the biggest cost line on the P&L isn't what goes in the tank. It's who sits behind the wheel.



What's the Infrastructure Reality?

The power gap is the binding constraint. Over 100 depot trials with a single OEM confirmed that virtually no operator has enough grid capacity to charge electric trucks. This isn't a future problem. It's the problem right now.

Grid connections cost £50,000 to £5 million and take up to three years. The Depot Charging Scheme doesn't cover DNO upgrade costs, which is the single biggest infrastructure expense most operators face. This is a policy design failure.

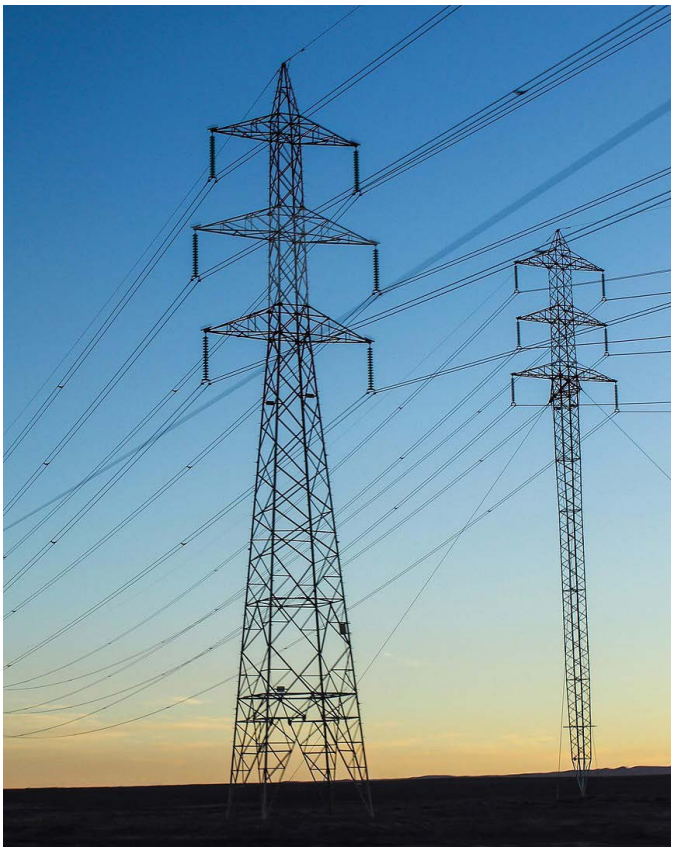
Behind-the-meter solutions are already working. Smart load management, battery storage, and profiled connections are letting operators charge fleets from grid supplies a fraction of the size they'd otherwise need. The technology exists. The question is whether operators know about it.

The power gap

There's no way to soften this. Over 100 depot trials conducted through a single OEM partner found that virtually no operator has enough power at their depot to support electric truck charging. Not close. Not with a bit of upgrading. Nowhere near.

> "I can guarantee you, every single one, the operator's not got enough power. Nowhere near enough power.

A standard 200kW DC charger frequently can't be supported on existing supplies. Operators are downgrading to 20-40kW units or bolting on battery storage as a booster just to get a single truck charged. This is the reality behind every optimistic TCO model: the vehicle might work, the energy price might work, but the depot can't deliver the power.



Between 80% and 90% of eHGV charging is projected to take place at depots. If the depots can't provide the power, the transition stalls regardless of what happens to vehicle prices or energy costs.

What grid connections actually cost

The range is enormous and largely unpredictable. A simple low-voltage connection with existing spare capacity might cost £10,000 to £30,000. A new high-voltage supply or significant upgrade runs £50,000 to £500,000. Major reinforcement requiring a new substation can reach £5 million per site.

One operator described a quote of £20,000 to £40,000 for an additional 100kVA. The room's reaction was telling: this was considered a bargain.

> "I agree, but I don't have £20,000

That exchange captures the gap between what infrastructure providers consider reasonable and what a small operator can absorb.

Timescales are just as problematic. Simple connections take months. Complex connections requiring reinforcement typically take 12 to 36 months, with some operators reporting connection dates as late as 2035. The demand connection queue grew 460% in six months to June 2025. The distribution-level queue stood at 172 GW as of July 2024. Ofgem's own end-to-end review in December 2025 found developers facing delays "a few years beyond original connection offers," with costs inflated up to 200% due to bottleneck-driven delays.

For large logistics sites, the numbers become eye-watering. East Midlands Gateway was the example discussed at length. There's an advert on the substation advertising 32 MVA available. Every occupier sees it and thinks the power problem is solved. It isn't. Stack all 14 occupiers' realistic peak demands and 32 MVA doesn't touch the sides. The exercise of aggregating real demand across occupiers and using smart technology to flex around it simply isn't being done. Landlords are leaving it to tenants because it's a minefield of investment they don't currently need to make.

The policy failure

The Depot Charging Scheme, updated in March 2026 with £170 million of funding, covers up to 70% of chargepoint and civil engineering costs, capped at £1 million per business. That's welcome. But it doesn't cover DNO grid connection upgrades. For most operators, the grid upgrade is the biggest single cost they face.

> The depot charge grant funding still doesn't cover DNO upgrades. That is the big part.

There is some structural relief. Since April 2023, Ofgem's Access Significant Code Review means demand customers no longer pay distribution network reinforcement costs below a High-Cost Cap of £1,720 per kVA. For a 1,000 kVA connection, only costs above £1.72 million are charged to the customer. But operators still pay for extension assets, non-contestable works, and any reinforcement above the threshold. For most depot-scale connections, the operator's share remains substantial.

There is one route that partially addresses this. Independent Distribution Network Operators (iDNOs) can deliver new or upgraded grid connections as an alternative to the incumbent DNO. The mechanism that matters is Asset Adoption Value: a payment back to the customer from the iDNO for adopting the new electrical assets onto their network. It directly reduces the cost of grid infrastructure and is only available through the iDNO route. Given the DCS won't cover DNO upgrades, this is one of the few ways to offset that cost. Most operators don't know iDNOs exist, let alone that they can get paid for using one.

DESNZ published a consultation in March 2026 on accelerating electricity network connections for strategic demand. It primarily targets data centres but explicitly mentions EV charging hubs. Whether it translates into faster, cheaper connections for freight depots remains to be seen.

What's actually working

The headline numbers are grim. But behind them, a set of practical solutions is already proving that operators don't need to wait for the grid to catch up.

The most important principle is this: you don't have to wait for the full grid connection to get started. A phased approach, designing around the capacity available today while planning upgrades in parallel, means operators can get trucks charging months or even years before a full grid upgrade completes. The grid connection lead time is the real bottleneck for most depots, not the technology. Waiting for the perfect solution means waiting years. Starting with what's available means trucks on the road now.

Go-Ahead's Croydon bus depot is the standout example of what's possible with existing supply. Using EO Charging's hub energy management system, the depot delivers over 8MW of charging power each night from just a 1.5MW site supply. That's load management doing the work that a grid upgrade would otherwise require. The depot nearly doubled its electric bus fleet to 42 vehicles without any increase in grid capacity. The technology exists. Most operators don't know about it.

At smaller scale, companies like ZPN Energy are demonstrating that a 30kW grid connection combined with a 500kWh battery energy storage system can provide full fleet charging for 20 electric vans without a grid upgrade. UKPN research found that smart charging with profiled connections can save depots up to £95,000 on connection costs. Connected Energy has deployed repurposed EV battery systems at Volvo Truck and Bus dealerships specifically to overcome grid constraints.

None of these are theoretical. They're operational, in the UK, now. The gap is awareness, not technology.

One structural problem that kills depot projects isn't technical at all. It's coordination. Most operators still piece together separate contractors for design, civils, electrical work, grid connections, and ongoing maintenance. Each handoff introduces delay, cost, and finger-pointing when things go wrong. The model that works is a single EPC contractor taking accountability for the full scope, from design through to maintenance. That model already exists on the infrastructure side. The fragmented approach is where things fall apart, and it's where most of the industry still sits.

UK charging infrastructure costs range from £500 for a basic slow charger to £30,000 for a rapid unit, with a 20x cost jump from AC to DC charging. But the hardware is the easy part. Academic research consistently finds that installation cost is the most variable factor, and without site-specific grid information, impossible to estimate. Multiple studies confirm what operators described in the workshop: the grid itself, not the charger on the wall, is where the cost and delay sit. Over a vehicle's lifetime, infrastructure is a small share of total cost. But the upfront capital and the years-long lead time are the binding constraints that determine whether trucks get charged at all.

Shared charging and depot sharing

If 80-90% of charging happens at depots, and most trucks are on the road during the day, depot chargers sit idle for most of the working day. Opening that spare capacity to other operators is the obvious move.

First Bus is already doing it. Their Electric Vehicle Charging Partnerships programme offers shared charging across more than 10 depots, with seven sites supporting eHGV charging at 75-350kW. Pricing for committed volume is converging toward 33-40p/kWh, which the industry broadly considers the upper viability limit before shared charging becomes a cost premium to diesel.

At Port of Tilbury, the Fleete Shared Hub became operational in early 2026: 5MW of capacity, 12 high-power chargers plus megawatt charging system units, built with £1 million of Thames Freeport seed capital that leveraged five times that in private investment. This is the model at work: public money de-risks, private capital builds.

One OEM dealer described their own depot charger going from "tumbleweeds passing the charger guns" to invoicing thousands of pounds a month once they opened access. Another operator described initial resistance from their operations manager ("we can't have competitors on site") that evaporated once the revenue numbers were shown.

But the energy supplier in the room pushed back hard on the long-term viability. Every kilowatt hour sold above roughly 35p is a cost premium to diesel. At best, the margin is 10p per kWh, and public charging networks are all losing money because utilisation is poor and they charge too much. It's a race to the bottom on passing through kilowatt hours. A short-term commercial opportunity, but not a sustainable business model on its own.

The operators' counter-argument was practical: it's not about making money on energy. If 98% of charging happens at the depot at cheap rates and 2% happens en route at a premium, the blended rate still works. The pallet network model, where nationally distributed depots already collaborate on freight, could facilitate shared charging across the same sites. That changes the equation because the infrastructure follows existing operational patterns rather than requiring new ones.

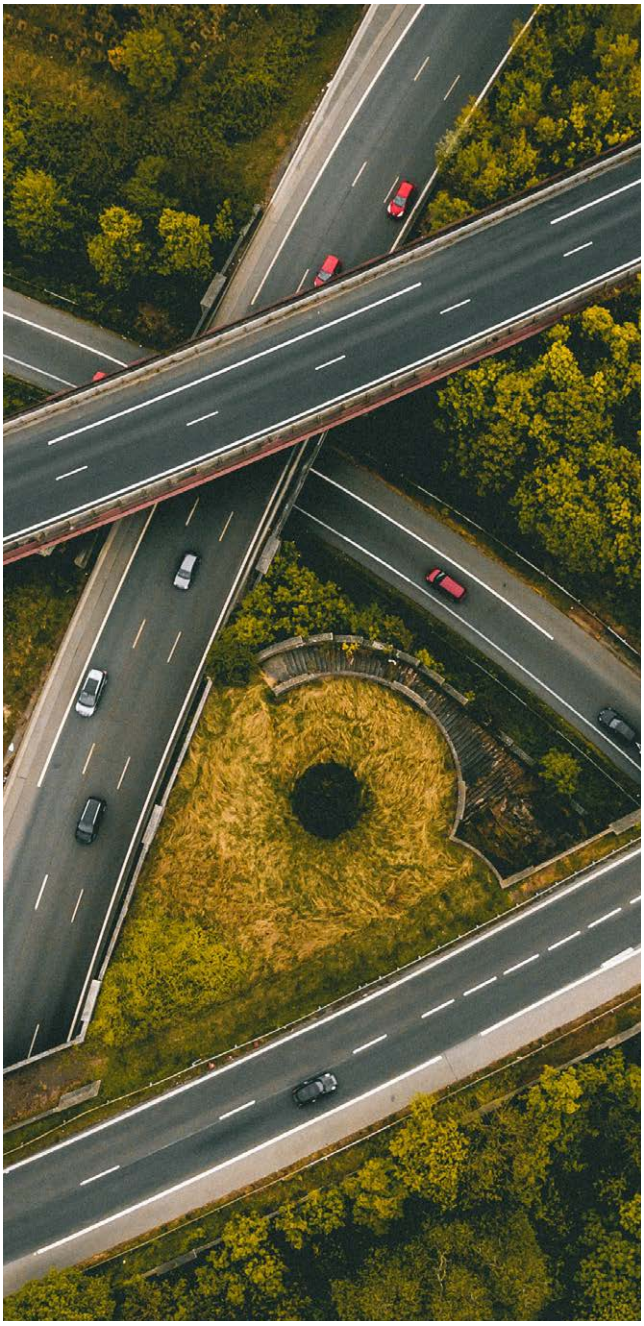
The scale dilemma

The fundamental tension in infrastructure planning remains unresolved. If you aggregate demand and build speculatively, you over-engineer sites and increase everyone's costs, destroying the business case for early movers. If you wait for demand-pull, the demand doesn't come because electricity costs too much and trucks cost too much. Grid capacity charges are based on maximum capacity, not actual usage, so building for peak creates ongoing cost regardless of utilisation.

This is not a problem the market can solve alone. It requires coordinated, area-based grid planning that anticipates freight electrification demand rather than waiting for individual operator applications. DESNZ's March 2026 consultation is a step in the right direction, but it's primarily aimed at data centres, and the freight sector's needs are different: distributed across thousands of small sites rather than concentrated in a few large ones.

The grazing philosophy

One operational insight that reframes the infrastructure conversation: it may be more efficient to top up frequently than to fully deplete and recharge. Battery charging curves mean the first 80% charges fast, the last 20% charges slowly. A combined approach of overnight full charge at the depot plus daytime "grazing" at customer sites could work well.



Supermarkets are the potential enablers. They've reduced power consumption through better refrigeration and LED lighting, freeing up roughly 75 amps of headroom per store. A 50kW charger on a loading dock, with a 90-minute unloading stop, provides 30-35 miles of range per visit. That allows trucks to carry significantly less battery, improving payload and reducing the depot power requirement.

It's several steps away from reality. Supermarkets are focused on their own operational priorities first. But it's the kind of thinking that turns the infrastructure problem from "we need massive grid upgrades everywhere" into "we need modest power at many existing locations." That's a fundamentally different, and more solvable, challenge. Alternative approaches like battery swapping, which claims to reduce grid connection requirements by up to 80%, are being trialled in Germany but remain some way from UK deployment.

The Hidden Costs and Risks

Insurance premiums aren't the problem. Write-offs are. Operators in the room reported no meaningful cost difference on premiums. But the insurance industry lacks the knowledge to assess electric truck damage properly, leading to repairable vehicles being declared total losses. At current vehicle values, that's a six-figure problem per incident.

Residual value uncertainty is the single biggest hidden blocker. There is virtually no published used-market pricing data for battery electric trucks in the UK or Europe. No Cap HPI valuations. No Glass's Guide. Finance providers are pricing blind, and the cost of that uncertainty lands on the operator.

The data that could fix both problems doesn't exist yet. No actuarial data on electric truck claims. No real-world residual value benchmarks. The academic literature is silent on both. Until the evidence base catches up with the technology, these risks will continue to suppress adoption.

Insurance: two stories in one room

The workshop surfaced a striking contradiction. Operators running electric trucks described insurance as a non-issue. One simply added the electric truck to their existing policy at the same rate as a diesel. Another reported the only difference being a higher excess on battery-related claims, with standard terms for everything else.

Then the insurance specialist spoke, and the picture changed completely.

Claims inflation for electric vehicles is running at two and a half times the general motor rate. That's not driven by fire risk. It's driven by higher repair costs, longer repair times, a shortage of specialist technicians, and the requirement for flatbed recovery rather than towing. Research by Thatcham found that EV incident claims cost over 25% more than their combustion equivalents and take 14% longer to resolve. There's some improvement as the repair sector builds capability, but the structural gap remains.

The knowledge deficit runs deep. Underwriters, in the specialist's assessment, aren't engaging with the evidence. They're defaulting to fear.

> "Underwriters aren't clients. They're just going, 'I think it's just going to catch fire. It's a mobile bomb.'

Loss adjusters are no better equipped. One participant described a customer told they couldn't place a charger or truck within 10 metres of a building. The response was to take the customer and the actuary to a bus depot where buses are parked nine inches apart and the nearest charger is 15 inches from the main building. The conversation changed entirely. But the fact that it took a site visit to override an arbitrary rule tells you where the industry's baseline understanding sits.

Storage requirements compound the problem. Industry guidance from major reinsurers now recommends that damaged electric vehicles be stored 15 metres from other objects. A storage compound that holds 100 combustion vehicles can safely hold just two electric ones. For recovery operators and insurers managing total loss vehicles, that's a significant capacity and cost constraint.

No specialist insurance product for electric trucks exists in the UK market. Operators are getting reasonable terms because they have good broker relationships and small fleets that don't move the needle on an insurer's book. As adoption scales and claims volumes grow, the current goodwill pricing may not hold.

There is, however, a powerful signal from an unexpected source. The first electric truck crossed the Channel Tunnel recently, the first of 10 planned runs ahead of opening to all electric commercial vehicles in summer 2026. Given Eurotunnel's history with fire incidents and the extreme consequences of a fire in a confined undersea tunnel, their willingness to proceed is arguably the strongest evidence point the insurance market has received.

The write-off problem

The real financial risk isn't what operators pay in premiums. It's what happens after an accident.

> The bigger risk isn't premium pricing. It's that insurers write them off too readily. That's the real problem.

Electric trucks use modular battery packs. A tractor unit might carry 15 separate 35kWh modules. If one is damaged in a collision, the technically correct response is to replace that module. But insurers and loss adjusters, lacking the knowledge to assess battery damage, are declaring vehicles total losses when they're repairable.

The economics compound the problem. The cost of a replacement high-voltage battery pack can exceed the used vehicle's market value after just one year of depreciation. Any battery damage after that point creates an economic case for total loss, even when the vehicle is structurally sound and mechanically functional.

The bus sector has nearly a decade of operational data showing far fewer fire incidents than diesel. But underwriters don't operate in the bus space, so the lessons haven't transferred. The education opportunity is significant: structured engagement with loss adjusters and actuaries, using bus industry evidence, could shift the risk assessment materially. Nobody has organised it yet.

None of the 12 academic papers reviewed for this report contains actuarial data on electric truck claims, battery fire frequency, write-off thresholds, or warranty costs. The academic literature has not yet addressed insurance risk for commercial electric vehicles. This is a genuine evidence gap, not a niche concern, and it directly confirms what the workshop's insurance specialist described: the data that would allow proper risk pricing simply doesn't exist.

Residual values: pricing in the dark

If insurance is a knowledge problem, residual values are a data problem. And the data doesn't exist.

Finance providers are setting residual values based on assumptions, not evidence. The first empirical resale data won't emerge until 2027 or 2028, when early vehicles start coming off their initial contracts. Until then, every lease rate for an electric truck includes a premium for uncertainty that nobody can quantify.

> The more you pay for something, the more bothered you are about its residual value. If you've paid £250,000 for a truck, you're really bothered about what it's worth in five years. If you've paid £90,000, are you bothered if it goes for seven or twelve? Probably not.

The passenger car market offers a cautionary tale. Used EV values roughly halved between late 2022 and late 2024, driven by new model launches, falling list prices, and range anxiety among second buyers. By late 2025 the gap was narrowing, with electric cars retaining 38-42% of value after three years compared to 35-40% for petrol. But the volatility spooked the finance sector. Van fleets responded by shifting overwhelmingly to operating leases to transfer residual value risk to leasing companies.

For trucks, one component-based analysis offers a counter-narrative worth noting. Electric trucks retain less value than diesel in the first five years (15-25% vs roughly 30%), but retain higher residual value after year eight, because the battery retains second-life value even after it's no longer fit for transport. That crossover point matters. If the industry shifts to longer ownership cycles, as Section 5 argues it will, the residual value picture for electric trucks improves significantly.

Academic TCO models consistently identify salvage value and depreciation as the most sensitive variables in the electric vs diesel comparison. The finance specialist in the room challenged the OEM directly: independent funders are already taking similar residual value positions, so why aren't manufacturers being more aggressive with guaranteed buybacks? The answer was candid. Early EV residual value bets in the car market went badly wrong, and the OEM's parent company has prioritised financial caution.

That caution has a cost. Without OEM-backed residual value guarantees, the finance sector prices in maximum uncertainty, and operators pay for it in higher lease rates or larger deposits. **A detailed blueprint for a government-backed Residual Value Guarantee was published in late 2025, modelling how £10 million in reserves could mobilise over £228 million in private capital. It remains unimplemented. That's a missed opportunity. The mechanism exists. The modelling is done. The political will isn't there.**

One regulatory development may help. From February 2027, EU Battery Passport regulations will require all EV batteries above 2kWh to carry digital passports tracking state of health. If the UK adopts equivalent standards, this creates the transparency that finance providers and second buyers need to price residual values with confidence rather than guesswork.

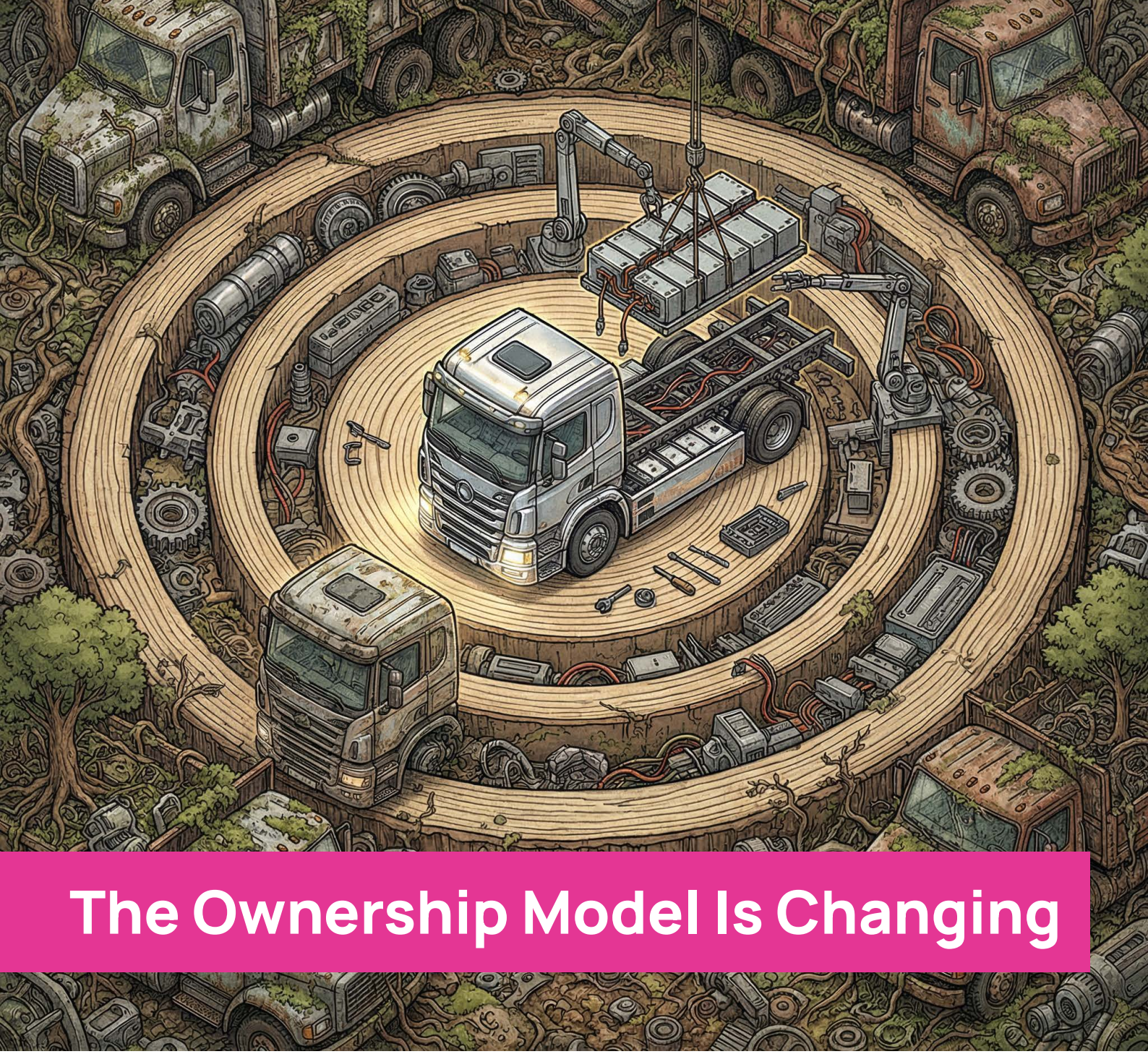
Battery warranty discipline: the human behaviour risk

There's a final hidden cost that bridges into the ownership model discussion in Section 5. Battery warranties require adherence to charging protocols. If operators invalidate warranties through poor charging practice, the TCO model collapses.

The risk is real and honestly acknowledged. One participant admitted that because they lease their electric car, they charge to 100% every time, because it's not their problem. If they owned it, they'd limit to 87%. At fleet scale, the difference between managed, stepped-down overnight charging and just plugging in and blasting to full is significant for long-term battery health.

Research tracking over 22,000 electric vehicles found that those with frequent fast charging retained 76% state of health after eight years, compared to 88% for vehicles predominantly using lower-power charging. That 12-percentage-point gap is the difference between a battery that's still commercially viable and one that needs replacing years early.

One finance provider described insisting on controlling the charging whenever they lease the battery, because without visibility on how the battery is being used, they can't manage the risk. That's a rational response. But it means operators cede control of a core operational function to a third party. **The tension between battery longevity and operational flexibility is one of the unresolved challenges of the transition.**



The Ownership Model Is Changing

The industry is shifting from 5-year replacement cycles to 15-20 year vehicle life. Multiple operators independently described plans to run electric trucks for a decade, refit with new batteries, and run them for another decade. No academic study, government model, or industry report has yet modelled this scenario.

Battery-as-a-service could eliminate the CapEx barrier entirely, but UK frameworks are not ready. Decoupling battery ownership from the vehicle shifts the cost to opex and unlocks scale benefits. Current UK legislation on liens and asset title can't cleanly handle who owns what when the chassis and battery belong to different parties.

The bus sector proves longer ownership works. With 14-year battery warranties, fleets running nine years without a single cell failure, and separated management of chassis, battery, and charging as distinct assets, buses are 7-8 years ahead. The truck sector's barrier isn't technology. It's contract length.

Nobody in the room set out to redesign how the truck industry thinks about vehicle ownership. But that's what happened. Several operators, unprompted and independently, described plans that would have been unthinkable five years ago: buying electric trucks, running them for a decade, fitting new batteries, and running them for another decade. One outlined a strategy to stop buying diesel entirely by 2032, convert existing diesel vehicles to electric, and extract a further ten years of service from each chassis.

> Is there even such a thing as a second-hand battery electric truck? Or is it more of a Trigger's Broom situation and you just get bored of it?

The Trigger's Broom truck isn't a joke. It's a business model. The steel chassis, if maintained, lasts effectively forever. Axles, suspension, and cab components are commodity items. The only major replacement is the battery pack, and that's a planned event, not a failure. One operator put it simply: they expect to get 20 years out of a vehicle if they're sensible about it. A large aggregates company, not present but cited in the discussion, had reached the same conclusion independently. They know how to manage a chassis for 15 years. The battery is the only uncertainty.

This shift changes everything downstream. Finance models built around 3-5 year lease cycles don't work for a 15-year asset. Residual value assumptions designed for diesel trucks that depreciate on a predictable curve don't apply to a vehicle whose most expensive component can be replaced and whose running costs fall over time. TCO models that compare electric against diesel over five years systematically understate the electric case, because the electric truck is still running when the diesel would have been sold.

No published academic study has modelled a 10-20 year truck ownership scenario. TCO analyses typically assume 4-8 year ownership periods. Research on heavy-duty vehicles shows that extending ownership from 6 to 16 years dramatically improves the battery electric case, but the 15-20 year horizon described by workshop participants sits entirely outside the existing evidence base. Recent component-level analysis suggests battery electric trucks retain higher residual value than diesel equivalents after Year 8, driven by ongoing second-life battery value. The ownership model emerging from operators may be the workshop's most original contribution to the evidence.

Battery-as-a-service: the mechanism

If the chassis and the battery have different lifespans and different economics, it makes sense to own them separately. A third-party battery manager could optimise charging based on energy price and cell health, negotiate better insurance rates at portfolio scale, and offer lease rates individual operators can't access. The analogy was made explicitly: nobody refines their own diesel. Operators shouldn't need to become battery management experts.

One energy company outlined a model where, by 2027, a small operator could acquire a truck for effectively zero CapEx. The battery cost shifts to opex, bundled into the fuel cost. If the battery isn't on your balance sheet, the whole equation changes.

The mechanism isn't theoretical. Zenobē has been doing battery sale-and-leaseback on owned buses for years. First Bus and Hitachi ZeroCarbon have a £100 million joint venture running. NEOT are structuring BaaS deals across the UK and EU. What doesn't exist is an off-the-shelf product a broker can offer a six-truck operator alongside a standard hire purchase agreement.

Three barriers stack. First, title and lien: UK law can't cleanly resolve who owns what when the truck is on HP from one provider and the battery is leased from another. Workarounds exist, but they require bespoke legal structuring, which SME-scale deals can't absorb. Second, standardisation: nobody has productised the structure. A broker can offer standard HP in an afternoon. A BaaS deal takes months. Third, accounting: IFRS 16 treats long-term service contracts as leases, killing the opex benefit. Most SME hauliers report under FRS 102 where the distinction still exists, but finance providers' risk models are shaped by IFRS thinking. The effect travels downstream.

An honest counter from operators already doing this at scale: the original rationale was the mismatch between battery life (five to seven years) and vehicle life (twelve to fifteen). As warranties extended to fourteen years and cell prices collapsed, the splitting case weakened. Whether BaaS comes back as a dominant model depends on where battery degradation, warranty length, and new cell prices settle.

Aviation solved component-level asset finance decades ago. Road freight has no equivalent framework. It's specific, fixable, and would unlock real investment from the operators who need it most.

Battery second life: an honest disagreement

The room didn't agree on whether truck batteries have meaningful second-life value, and the evidence doesn't resolve it either.

The sceptical case is blunt. Grid-scale storage cells can be bought new for approximately £50/kWh. Batteries coming out of trucks were originally three times that price. Add the labour cost of removal, repackaging, certification, and cooling, and they can't compete on a cost-per-kilowatt-hour basis with new cells. Academic estimates put second-life battery costs at $111-250/kWh, well above the new-cell benchmark. Western labour costs make the whole proposition harder still.

> "The economics are terrible. You've got to smash it to pieces. It's incredibly expensive, incredibly toxic.

The optimistic case rests on applications, not chemistry. An infrastructure provider reported 44 second-life battery systems currently deployed, sourcing used batteries from China and Sweden, including written-off trucks. The argument: there are plenty of high-value applications before you get to grid-scale. Construction sites, home storage, depot storage. With 15 modular 35kWh packs in a tractor unit, there's intrinsic reuse value at the module level. Industry projections suggest the second-life market could exceed 30 GWh per year by 2030, translating to a $2-2.5 billion market globally.

A specialist in the bus sector estimates 70-80% of battery modules will have adequate state of health for second-life applications. But even there, the economics of dismantling, testing, and repackaging are marginal at best. The material stewardship argument (we burn fossil fuels without a second thought, so we should at least try to reuse batteries) was raised and met with a pragmatic response: if new cells are cheaper and safer, the market will choose them.

The honest conclusion: the market hasn't decided yet. The EU Battery Passport regulation, effective February 2027, will require digital state-of-health tracking for all EV batteries above 2kWh. That transparency may unlock the second-life market, or it may confirm that new cells win on economics. Either way, the data will exist.

The bus sector proves it works

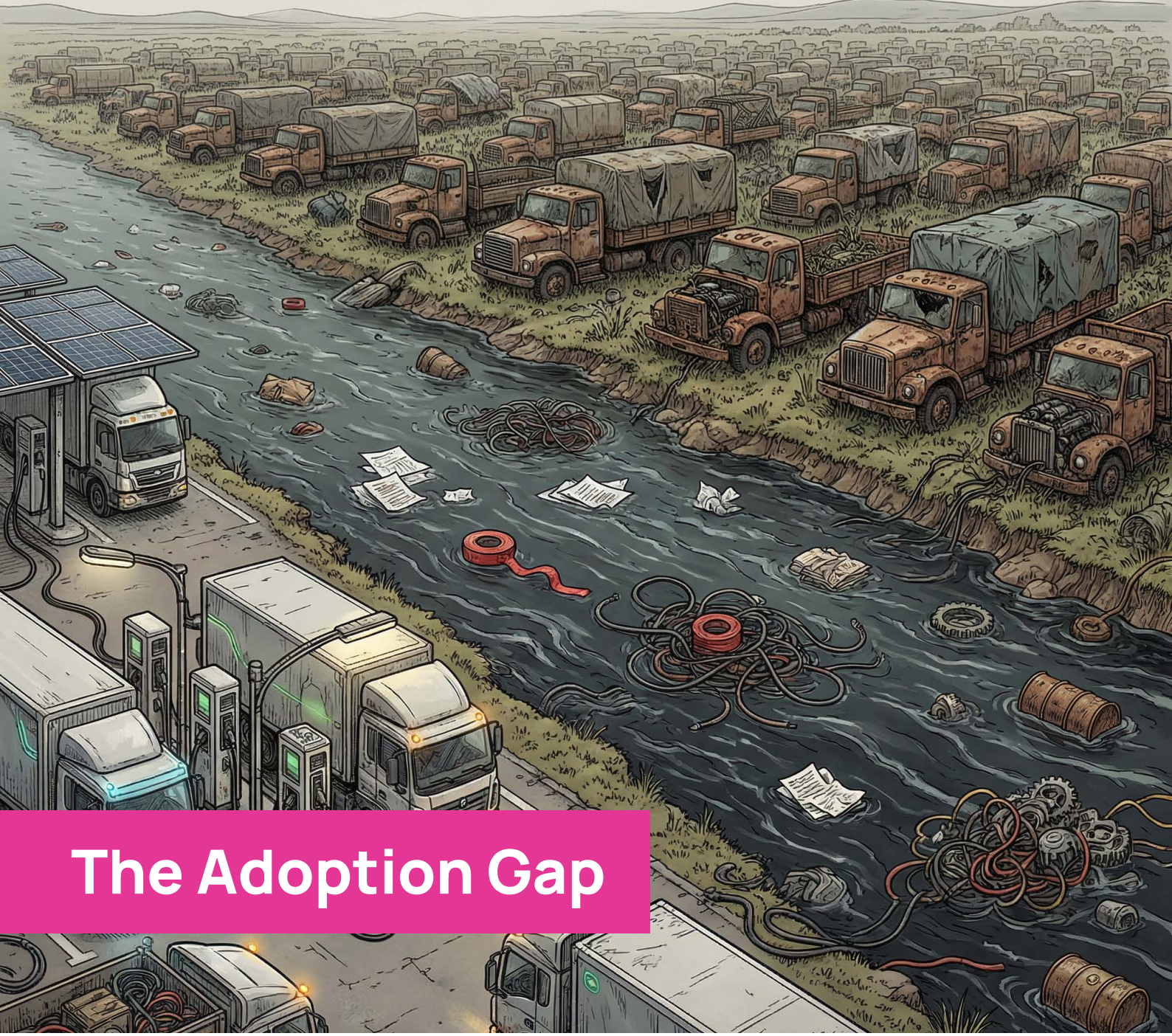
The bus industry is 7-8 years ahead, and their experience directly validates the longer ownership model. Battery warranties of 14 years are now available. One fleet introduced 35 electric buses in 2016 with a planned 7-year battery replacement cycle. Nine years on: zero cell failures, zero replacements needed. The planned replacement was cancelled and the savings split between operator and provider.

The bus sector has evolved to separate management of chassis, battery, and charging as distinct fleet assets. One specialist supports over 2,080 electric buses across 120 UK depots, with data showing that careful fleet management can delay first battery replacement by up to three years in a 50-bus fleet. Buses are expected to need two battery replacements over a 20-year vehicle life, which is consistent with the truck operators' plans.

The critical difference is contract length. Bus operations run on 7-year contracts that underpin the investment case. Standard truck deals are 3-5 years. Some forward-thinking operators are now looking at 8 years, but without longer contracts, the finance case for extended ownership remains harder to close.

What this means for OEMs

If vehicles run for twice as long, manufacturers sell half as many trucks. This was stated plainly in the room, and it explains a significant part of OEM reluctance on electrification. The three largest truck manufacturers outside China have all lobbied the European Commission to wind back electrification targets. The shift from a 3-5 year replacement cycle to 10-15 years or longer is not just an operational change. It's an existential challenge to the manufacturing business model.



The Adoption Gap

The biggest risk to the transition isn't technology, cost, or infrastructure. It's that most of the industry isn't paying attention. An RHA survey found 70% of operators have no plans to add zero emission vehicles. Just 9% are currently operating electric trucks. Early adopters have proven the economics can work. The challenge is reaching operators who haven't looked at the numbers since 2022.

The UK is falling behind European comparators, and the gap is structural. Germany registers electric HGVs at roughly six times the UK rate, supported by toll exemptions, lower electricity prices, and more generous weight allowances. The Netherlands has achieved 14% zero emission heavy truck share. UK disadvantages won't close without deliberate policy action.

First-mover advantage is real but the echo chamber is the enemy. One operator attributed 80% revenue growth directly to electrification credentials. But too much time is spent with the willing. The non-believers and doubters are where the effort needs to go.

The 70% problem

In March 2025, the Road Haulage Association surveyed its membership. The headline finding: 70% of HGV operators have no plans to add zero emission vehicles to their fleets. Just 9% are currently operating electric trucks. A further 14% plan to within five years. The rest are waiting, or have actively decided against it.

This isn't a technology problem. The previous five sections of this report show that electric trucks work, that running costs are lower, and that the TCO case is closing fast. **The 70% aren't rejecting the evidence. Most of them haven't seen it. They're running businesses on 2-4% margins with the day job to do, and electrification hasn't yet made a compelling enough case to demand their attention.**

One operator described relaying workshop discussions to Transport Association membership and getting uniform pushback. The barriers cited most often were limited range (45%) and high purchase costs (38%), both of which reflect perceptions that are two to three years out of date.

The UK's adoption figures tell the same story from a different angle. Zero emission HGV registrations reached roughly 1% of new registrations in the first half of 2025. Germany, where toll exemptions save operators up to €49,000 per truck per year, reached 4.5%. The Netherlands, with dedicated purchase funding, hit 14%. The EU-27 average is 2.0%. The UK is at the back of the pack.

The structural gap

Part of the adoption gap is a perception problem. But part of it is a policy problem, and that part is fixable. UK operators face three concrete structural disadvantages that make the business case harder than it needs to be.

Higher electricity prices. UK commercial rates run 20-28p/kWh, against roughly 15-20 euro cents in Germany. That's a permanent operating cost disadvantage baked into every mile driven. **No toll exemptions.** Germany's Maut is a per-kilometre HGV toll, and zero-emission trucks are waived from it, saving operators up to €49,000 per truck per year. France offers full toll exemption for ZEVs. The UK doesn't toll HGVs at all, so there's no equivalent mechanism to offer. European operators get a structural incentive per mile. UK operators get nothing. **A weaker weight allowance.** The UK's 2-tonne zero-emission derogation is unusable without a matching axle limit increase. The EU is proposing 4 tonnes with a drive axle increase from 11.5 to 12.5 tonnes.

These aren't subsidies. They're basic competitive parity. The Netherlands, with dedicated purchase funding through its AanZET programme, has achieved 14% ZE heavy truck share. Germany is at 4.5%. The UK is at 1%. The gap isn't explained by technology or operator attitude. It's explained by the policy environment operators are working within.

The dampening effect

Then there's a separate problem that's harder to quantify and harder to fix. The workshop named it the dampening effect: a systematic suppression of enthusiasm for electrification, partly funded by fossil fuel interests, that clouds professional judgment on what should be straightforward cost-of-business decisions.

One participant described it as a constant media barrage that leads professional operators to dismiss electrification on emotional grounds rather than examining the numbers. This isn't a fringe concern. One OEM dealer group included the dampening effect in their formal response to the government's decarbonisation consultation, which is unusual for a dealer to submit and speaks to how seriously those closest to the market take this issue.

> There is an enormous pushback, funded by fossil fuel industry, which is dampening people's enthusiasm. It's clouding their professional judgement.

The structural disadvantages and the dampening effect feed each other. The harder business case gives sceptics real ammunition. The media narrative gives operators permission not to look at the numbers. Breaking that loop requires both fixing the policy gaps and getting into the rooms where the sceptics are.

Breaking out of the echo chamber

The operators and specialists in the room acknowledged that too much effort goes into preaching to the converted. Conferences, webinars, and industry groups tend to attract the 10% who are already engaged.

The practical ideas discussed were deliberately uncomfortable. Taking electric trucks to Truckfest, a consumer-facing event with a deeply sceptical audience, and being prepared to take the pushback. Engaging through trade association regional groups, described as difficult environments where operators are hostile rather than indifferent. Putting customer-operated trucks on exhibition stands rather than manufacturer demos, converting the message from "we're testing this" to "operators are doing this daily."

The consensus was clear: peer-to-peer operator conversations are far more persuasive than academic arguments, commercial pitches, or policy papers. One operator who had taken their electric trucks to public events put it simply: the more people who do it, the easier it gets.

> The data centre sector, the richest sector on earth, is putting in gas turbines. And we're expecting a low-margin business like haulage to embrace the biggest technical evolution ever. It's completely unrealistic.

An attempt by the Energy Systems Catapult's eFREIGHT 2030 programme to broaden engagement beyond its consortium to include SMEs received zero expressions of interest. Their own report acknowledges that its findings reflect larger operators and supply chain partners only. The very operators most in need of support are the ones not engaging.

Who pays the green premium?

For operators whose customers don't have Scope 3 reporting obligations, and that covers most SME hauliers' customer base, there is nobody obvious to absorb any remaining cost premium. Academic research on urban freight confirms this: EV adoption doesn't generate extra revenue because customers won't pay more for zero emission deliveries.

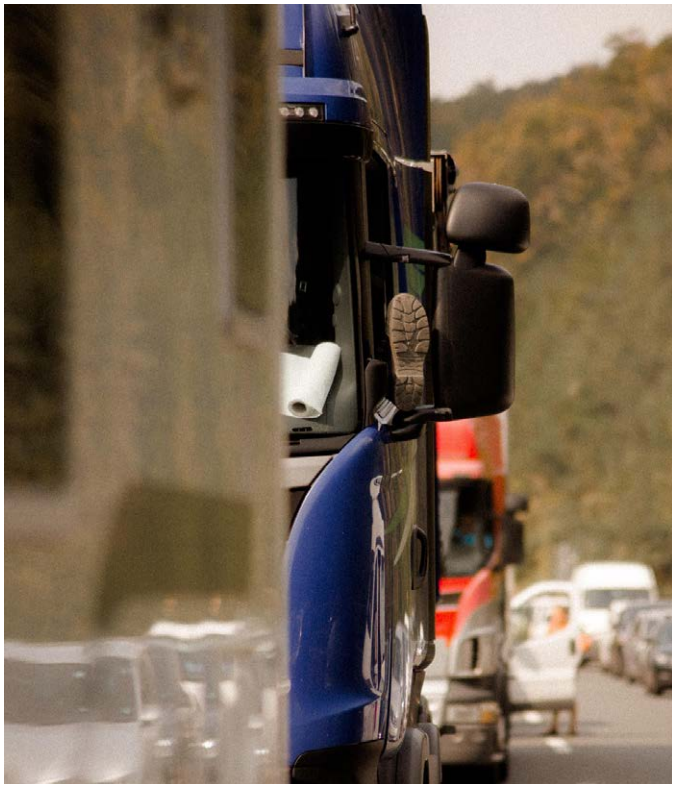
Some large companies are leading. One major FMCG brand was cited as covering the cost differential between diesel and HVO for subcontracted operators and offering access to their charging infrastructure. A port operator has said it would rather support a distributed operator model than run thousands of trucks itself. These are positive examples, but they're exceptions.

One operator in the room described 80% revenue growth in the past year, attributed almost directly to their electrification and sustainability credentials. First-mover advantage is real. But the room acknowledged it won't last. As more operators electrify, the differentiation disappears. The window for commercial advantage from early adoption is measured in years, not decades.

Market forces vs government intervention

The sharpest unresolved tension in the entire workshop. Both positions have merit, and the room did not reach consensus.

The market forces argument runs like this: all these problems go away when it's cheaper. Chinese OEMs offering a step change in pricing will drive adoption faster than any subsidy. If a business can't build an economic model that reduces an operator's total cost versus diesel, it doesn't deserve to have a market. Government targets are soft, not mandates. Market forces will get there.



> Until you're saving people money, no one gives a crap. And when you save people money, everyone comes to your door.

The government intervention argument: market forces will take longer than the targets allow. Grid build-out can't be done by enterprise alone. The economics of truck charging are low-margin (3% was the figure cited, the same as operating a truck), so expecting operators to become sophisticated energy traders is unrealistic. The UK doesn't yet have an HGV ZEV sales mandate. A consultation launched in January 2026 explores three options, including a ZEV mandate supported by CO2 standards, but no annual percentage targets have been set.

The China comparison kept surfacing. Not as advocacy for a command economy, but as context for what's possible: centralised charging at 5p/kWh, grid connections delivered on request, dual-shifted 67.5-tonne trucks. Pakistan installs solar panels because it's cheaper than the grid, despite being a low-income country with conflict. The point isn't that the UK should copy either system. The point is that cost wins, regardless of the political model delivering it.

Research on government incentives consistently finds that purchase grants accelerate BEV competitiveness by 3-5 years, acting as a time-buying mechanism rather than a permanent solution. Multiple studies note that the UK's approach of several small, fragmented grant schemes, rather than one comprehensive programme, adds complexity for operators and reduces effectiveness. The Green Finance Institute identified 10 financial solutions to unlock private capital for zero emission trucks in 2023. As of March 2026, none have been implemented.

The cost of inaction

The question was raised repeatedly but never resolved: **what's the cost of not doing this?**

Total cost of ownership models don't include the NHS burden of diesel particulates, the economic cost of climate damage, the air quality impact on communities near logistics hubs, or the future efficiency gains that electrification enables (including the pathway to autonomous freight, which will not run on diesel). There's an argument for including these costs. There's no agreed methodology for doing so.

What can be said is this: the UK truck industry burns roughly £26 billion of fuel every year, and will do again next year, and the year after. If that money were spent on renewables and infrastructure instead, it would be spent once. The transition is coming. The only question is whether the UK's operators lead it or are dragged into it late, at higher cost, on someone else's terms.

Operators who engaged with the workshop identified five requirements for any business model that will work at scale: financial clarity with transparent costs, flexibility without long-term lock-in, operator control over core decisions, genuine SME inclusivity, and renewable energy integration as a core offering rather than an add-on. These are not aspirational principles. They are the minimum threshold for reaching the 70%.

Recommendations

This workshop surfaced problems that are well understood by the people in the room but poorly understood by the people who need to act on them. These recommendations are drawn directly from the discussion. They're specific because vague ones get ignored.

If three things happened tomorrow, they would move the needle more than anything else. First, the Depot Charging Scheme needs to cover DNO grid upgrades. It's the most obvious gap in current policy and the simplest to fix. Second, government should implement the Residual Value Guarantee that's already been designed, modelled, and published. £10 million in reserves could mobilise over £228 million in private capital. Third, grant funding needs ring-fencing for smaller operators. Without it, the 70% of the industry that most needs support will never start. Everything else in this section matters. But those three would unlock the most progress, fastest.

For operators

Model your energy costs honestly. Put 18 to 20p per kilowatt hour into your spreadsheet as the base case. Current market rates of 23 to 26p are the reality. Don't plan around hopes of cheaper power, government intervention on pricing, or rooftop solar closing the gap. If the numbers work at 20p, they work. Anything below that is upside, not baseline.

Interrogate the data you already have. Most operators have telematics. Few have used that data to answer the question that matters: which of my routes are electrifiable today? Standard tracking tells you where trucks went and how long they took. It doesn't tell you duty cycle energy demand, dwell times with charging potential, or which vehicles return to base with range to spare. Either get your provider to run that analysis or bring in someone who can. A fleet readiness assessment based on actual operational data is the first step, not the truck.

Plan for 10 years, not five. The ownership model is changing. Electric trucks don't wear out the way diesels do. The chassis lasts. The batteries get replaced. If you're still modelling a five-year replacement cycle, you're overstating the cost of electric and understating the cost of diesel. Operators already running electric trucks are planning for 15 to 20 year vehicle lives. That changes the entire TCO calculation.

Share your charging or use someone else's. Depot chargers sit idle most of the day. If you have spare capacity, selling it to other operators improves your economics and theirs. If you don't have charging infrastructure, find a depot near your routes that does. The pallet network model already exists for shared assets. Apply it to power.

Aggregate your buying power. If you operate fewer than 50 vehicles, you're not going to get a volume discount on your own. Work through your pallet network, trade association, or regional operator group to place collective orders. Demand aggregation was identified in the workshop as one of the most practical routes to giving SMEs the same pricing that large fleets negotiate directly.

For government

Ring-fence grant funding for smaller operators. The current Plug-in Truck Grant structure allows large operators placing bulk orders to absorb the entire allocation. Reserve at least 40% of annual grant funding for operators with fewer than 50 vehicles. Without this, the operators who most need support to start their electrification journey are the ones least likely to get it. The Energy Systems Catapult's attempt to engage SMEs in business model research received zero responses. That should alarm everyone.

Make the Depot Charging Scheme cover DNO upgrades. The scheme funds chargepoints and civils but not the grid connection upgrade, which is frequently the largest single cost. For many operators, the DNO quote is the barrier, not the charger. This is the most obvious gap in current policy and the simplest to fix.

Implement the Residual Value Guarantee. The Green Finance Institute proposed it. CALSTART published the blueprint. The modelling is done. Residual value uncertainty is the single biggest barrier to finance flowing into electric trucks. A government-backed guarantee removes the risk that is currently paralysing lenders and inflating lease rates. Every month this isn't implemented is a month of capital sitting on the sideline.

Treat freight depot power with the same urgency as data centres. The demand connection queue grew 460% in six months to June 2025. Operators are being quoted connection dates of 2035. The March 2026 DESNZ consultation on accelerating network connections for strategic demand explicitly mentions EV charging hubs. Freight depots must be included in that priority framework, not left in the general queue behind data centres.

Close the structural gap with Europe. Germany's Maut waiver saves operators up to £40,000 per truck per year. France offers full toll exemption. The UK doesn't toll HGVs, so there's no exemption to offer, but the effect is that European fleets get a per-kilometre incentive UK fleets don't. Either introduce HGV road pricing with a ZE exemption, or find another per-mile mechanism of equivalent value. The 2-tonne zero-emission weight allowance is unusable without a matching axle limit increase. The EU is proposing 4 tonnes with a drive axle increase to 12.5 tonnes. At minimum, match that. These aren't subsidies. They're basic competitive parity.

For the supply chain

OEMs: build the second-hand market now. Guaranteed buyback programmes, maintenance packages for second and third owners, and published battery warranty terms are the minimum. If the only route into electric trucks is buying new from you, the transition stalls at the operators who can afford new. The SME backbone of this industry needs used vehicles with confidence attached.

Finance providers: offer terms that match the asset life. Standard three to five year truck finance doesn't fit an asset that lasts 15 to 20 years. Offer 8 to 10 year terms. Share residual value risk rather than passing it entirely to the operator. Make battery-separated financing a standard product, not a bespoke negotiation. Operators ranked concessional finance as the most attractive model. They ranked as-a-service dead last. Build products they actually want.

Insurers: stop writing off repairable trucks. The bigger risk to operators isn't premium pricing. It's economic total loss declarations on vehicles that could be repaired. Develop eHGV-specific insurance products. Run a structured education programme for loss adjusters and actuaries, using the bus sector's near-decade of claims data as the evidence base. The knowledge exists. It just hasn't reached the people making underwriting decisions.

Energy companies: simplify. Wrap the complexity into a single delivered price per kilowatt hour. Offer blended depot and en-route rates that operators can compare directly against their diesel cost per mile. If the energy proposition isn't as simple as filling up with diesel, the 70% of operators who aren't yet engaged never will be.

Unresolved Questions

Not everything was settled. These ten questions emerged from the workshop without clear answers. Some will be addressed directly in Workshop 2 (Depot Power and Grid Infrastructure, 22 May 2026). Others need work from government, industry, or both.

Questions the market needs to answer

How would battery-as-a-service actually work for truck operators? The concept generated real enthusiasm, but nobody in the room could describe the contract structure, the risk allocation, or how UK asset finance law handles decoupled ownership of vehicle and battery. Until someone builds a workable legal and commercial framework, this remains a good idea without a delivery mechanism.

What does a practical demand aggregation model look like, and who convenes it? SMEs need collective buying power to access volume pricing, but coordination is difficult. Pallet networks and trade associations were suggested as natural conveners. The question is whether any of them will take it on, and whether OEMs will engage with aggregated orders from operators they don't have individual relationships with.

When does the first genuine second-hand BEV truck market emerge? The shift to longer ownership cycles may delay this by several years. If operators keep vehicles for 15 to 20 years, the traditional 5-year used market disappears. But first-time buyers who can't afford new need a route in. Nobody could say when that market develops or what it looks like when it does.

Will OEMs open up battery management systems, or will proprietary lock-in block second-life and third-party servicing? Standardisation would accelerate the used market, enable battery-as-a-service, and support second-life applications. But OEMs have commercial reasons to keep BMS data closed. The EU Battery Passport regulation (effective February 2027) may force the issue. The UK's position is unclear.

Questions government needs to answer

How does grid investment move from reactive, operator-by-operator requests to coordinated area-based planning? This is the central question for Workshop 2. Individual depot connections are manageable. But the current model, where each operator joins a queue and waits for DNO capacity that may not arrive for years, cannot scale. The demand connection queue grew 460% in six months to June 2025. Something structural has to change, and it won't come from the market alone.

How should operators commit to energy contracts when they don't know how many trucks they'll be running in two to three years? A single electric truck consumes as much energy as a whole depot. Scaling from two trucks to twenty changes procurement strategy entirely, but operators can't predict the pace of their own transition.

Can the cost of delayed electrification be quantified in a way that actually influences policy? Total cost of ownership models exclude the NHS burden of air pollution, the climate cost of continued diesel use, and the future efficiency gains from autonomous electric vehicles. Everyone in the room agreed these costs are real. Nobody had a methodology for including them. Without one, the policy case rests entirely on operator economics, which isn't yet strong enough to drive the transition at the speed targets require.

Questions that need collaborative work

Is there scope for a structured programme to educate loss adjusters and actuaries using bus sector data? The bus industry has nearly a decade of claims experience with electric vehicles. The truck insurance market hasn't absorbed any of it. A single bus garage visit changed one actuary's position entirely. Scaling that kind of intervention could shift the insurance market faster than waiting for truck-specific claims data to accumulate.

What would it take to get major retailers to install chargers on loading bays? Supermarkets have spare grid capacity and trucks already sit at their docks for 60 to 90 minutes. Loading bay charging could extend range, reduce battery size, and improve payload. But retailers are focused on their own operations and nobody has initiated the conversation at scale. This is a coordination problem, not a technology problem.

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The following sources informed this report. Academic papers provided background validation for workshop findings and appear in "What the research says" boxes. Industry reports and data sources supplied UK-specific evidence on costs, policy, and market conditions. No inline citations are used in the report body; this list is for readers who want to follow the evidence trail.

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