

Electric Trucking

From cost barrier to
competitive advantage

How integrated charging systems can cut a
heavy-duty fleet's TCO by up to 10% versus diesel

10%
TCO reduction



SBRS

A Member of the Shell Group

Reframing the cost of electric trucking

Electric trucking is entering a turning point: once widely seen as prohibitively expensive, it is now becoming increasingly cost-competitive compared to diesel under the right conditions. But what if this shift isn't fully understood yet because of the way fleet electrification costs are often calculated?

When the debate focuses on vehicle acquisition costs in isolation, it's hard for electric trucks to compete with their diesel counterparts.

But the cost of electrification isn't determined by the truck alone. It's shaped by the wider system that supports it – a system that can be optimised by fleets.

For fleet managers, depot owners and business decision-makers, the only meaningful comparison is total cost of ownership (TCO): the full cost of owning and running a vehicle across its working life.

When all the elements of electric trucking TCO – including charging infrastructure and the energy it uses – work together as part of an integrated system, the economics begin to change in favour of electrification.

That's why Shell's modelling shows that heavy-duty fleets using an integrated charging network and services can achieve up to 10% lower TCO compared with diesel.¹

This report examines how a system-level approach to electrification can unlock these efficiencies and improve overall cost performance.

The current state of fleet electrification

Electric trucks are not only the future of road freight – they are an increasingly viable option for fleet operators today. But, the challenge is making the economics work across vehicles, infrastructure and daily operations.

Upfront costs remain a key barrier. Electric trucks typically cost 1.6–2.3x more than diesel equivalents², while resale value (or depreciation) is less predictable due to the relative immaturity of the second-hand market.³

Infrastructure requirements add further complexity. Depot upgrades can be challenging, particularly when grid connections are constrained, and fleets often struggle to match available public charging locations to their existing routes and schedules.

Despite these challenges, the fundamentals of electric trucking are strong. Electric trucks can be up to 55% more energy efficient than diesel equivalents⁴, which can translate into lower running costs per kilometre when managed effectively.

Up to 10% lower total cost of ownership vs. diesel.¹

The real cost of trucking operations

To calculate the complete TCO of a truck, operators need to assess both the vehicle and operating cost components:



To fairly represent these costs, TCO is typically calculated over a multi-year period, depending on fleet operations. For example, the Shell TCO model evaluates costs across a five-year period, enabling a more accurate representation of cost items that are variable or occur intermittently, such as maintenance and repairs.

Further detail on how these costs are modelled is outlined in the [Shell TCO Model](#) section.



¹ Potential TCO outcomes are based on Shell's model for a heavy-duty truck operating 116,000 km/year over 5 years, assuming a semi-public, energy-optimised eDepot with 75% private and 25% on-the-go charging. Estimated savings come from third-party eDepot use, Smart Charging energy cost reductions, and preferential network pricing, based on market references (excluding grid upgrades). Actual results will vary by market, vehicle type, and customer-specific factors such as energy prices, infrastructure costs, utilisation, and location.

² Energy Solutions Intelligence. "Electric Semi Trucks 2026: Tesla vs. Volvo vs. Freightliner Economics." 2026.

³ As more electric trucks arrive on the market and battery performance data becomes more widely available, increased certainty is expected – mirroring the journey seen in the passenger car market.

⁴ ICCT. "Total Cost of Ownership: Trucks in Europe." 2023.

⁵ While it's important to highlight the upfront investment in charging infrastructure, the Shell TCO model incorporates the cost of this infrastructure into the €/kWh energy cost paid by fleets when charging at their depot.

The integrated system behind the 10% saving

There's a reason electric trucking can already beat diesel on total cost.

Unlike diesel and other fossil fuels, electricity gives fleets the ability to choose and optimise how they utilise infrastructure, purchase energy and create value from their charging assets.

Access to an integrated charging network can allow fleets to reduce exposure to diesel price volatility, reduce energy costs by optimising charging to limit exposure to peak pricing and in some countries, avoid tolling costs. Operators can unlock additional value by enabling third-party access to charging infrastructure – transforming their charging assets from a cost centre into a potential revenue stream.

But the key to making electric trucking more financially viable than diesel is integration. These three economic levers must work together to deliver a lower TCO.

Electric fleets can already beat diesel on total cost – when all three levers work together.

The economics change when the system changes.

1

Turn charging into a revenue stream

- Open depot facilities to third-party fleets
- Earn income from every charging session
- Charger access, payment and settlement with site owner managed via Shell Card
- Generate revenue to offset energy costs and potentially exceed them

2

Lower the energy cost of electric trucking

- Control energy consumption at the depot
 - Use smart charging to charge trucks during cheaper periods automatically
 - Manage fleet charging times to avoid peak demand and high-tariff periods
 - Reduce cost per kWh through tailored contracts and long-term planning
- Lower electricity costs when charging on-the-go
 - Access discounted charging rates as a Shell fleet customer
- Reduce energy costs at the depot by up to 30% through charging optimisation⁶
- Benefit from zero-emission road toll exemptions (where applicable)

3

Access to charging that enables revenue generation and lower-cost energy

- Unlock an opportunity for revenue generation through Shell's EV charging network in Europe and lower energy costs
- Participate in EV credit initiatives that contribute to lower TCO
- Reduce the cost and complexity of getting started with a scalable, all-in-one solution like Shell Recharge PowerPack 500
- Connect charging across locations, routes and operating schedules to enable efficiency

A shared network that generates revenue

Depot charging powers a fleet's electrified operations but, when opened to third-party operators, it can also generate revenue. This revenue can offset and, in some cases, exceed a fleet's own charging costs – making it a major contributor to TCO reduction.

The way to generate revenue from charging is by joining an integrated network that allows fleets to share their infrastructure with other operators and gain a portion of the charging costs.

So, when a fleet's trucks are on the road, its charge points can be open to other operators, generating income from every third-party charging session.

By opening their depot infrastructure up to third parties and generating revenue, fleets can transform the economics of electric trucking and beat diesel on total cost.

How Shell enables revenue generation from charging

Shell's integrated charging network gives fleets the ability to open their depot infrastructure to other operators in **two ways**:



Semi Public charging

Depot owners can allow third-party fleets access to their charging facilities at times when utilisation is low.



eDepot+

Depot owners can grant charging access to approved subcontractors and logistics partners.

In both scenarios, the infrastructure owner can earn a margin from those third-party charging sessions.

Shell helps to increase utilisation by third-party fleets, matching depots with customers from its wider network based on routes. It also facilitates charging sessions, managing authentication, payment and settlement through Shell Card – meaning no complex admin for either fleet.

How fleets can move towards negative energy costs



1

Open depot access

Fleets generate income by opening depot infrastructure to third-party operators.



2

Generate income

Revenue from shared charging helps lower electric fleet TCO.



3

Reduce energy costs

Revenue from charging sessions can offset – and in some cases exceed – fleet energy costs.



4

Beat diesel on cost

In markets with limited EV incentives, semi-public charging helps electric trucks compete with diesel on total cost.

Shared charging revenue can offset, and even exceed fleet energy costs



Energy solutions that lower charging costs

Electric trucks can be up to 55% more energy efficient than diesel,⁸ but the cost of charging can vary widely depending on where and when vehicles charge.

The opportunity for electric fleets lies in managing where and when they charge – lowering TCO by reducing energy costs.

Delivering this requires solutions that:

- Reduce the cost per kWh of charging across the network
- Optimise charging schedules to avoid peak demand pricing
- Manage energy usage across depot facilities

How Shell enables lower energy costs for electric fleets

Shell helps fleets reduce energy costs through a combination of charging network access for electric trucks in Europe, smart charging and integrated energy management.

In Shell's model scenario (see: [The Shell TCO Model](#)), vehicles charge around 75% of the time at the depot and 25% on the road. Under these conditions, access to competitively priced charging across the wider network becomes a prerequisite for achieving a lower TCO than diesel. To address this, Shell provides fleets with discounted per-kWh pricing – via Shell Card – when charging at Shell Recharge and semi-public locations across the integrated network.

The more fleets utilise the network, the lower the prices can be and as the network expands, there's even more potential energy cost benefits.

At the depot, smart charging compounds this further. By scheduling fleet charging during off-peak periods when electricity tariffs are lower, including overnight, fleets can reduce their charging costs. With smart charging built into Shell's Charge Point Management System (CPMS), operators can optimise energy use automatically and manage their chargers seamlessly.

These solutions build on a foundation of reliable access to energy. Shell provides 100% certified renewable electricity (where available), tailoring contracts to the needs of each fleet. This is enhanced by grid connection support that helps fleets secure and manage the capacity needed for high-speed charging.

Shell's energy solutions can also integrate on-site renewable generation such as solar, battery energy storage and future vehicle-to-grid capabilities – helping fleets further optimise the cost of producing, storing and using electricity. On-site generation also helps to reduce dependence on the grid, giving operators greater protection against outages.

The power of energy efficiency

In optimised heavy-duty charging environments, smart charging and energy management can reduce energy costs by up to 30%.⁷

This saving is achieved by:



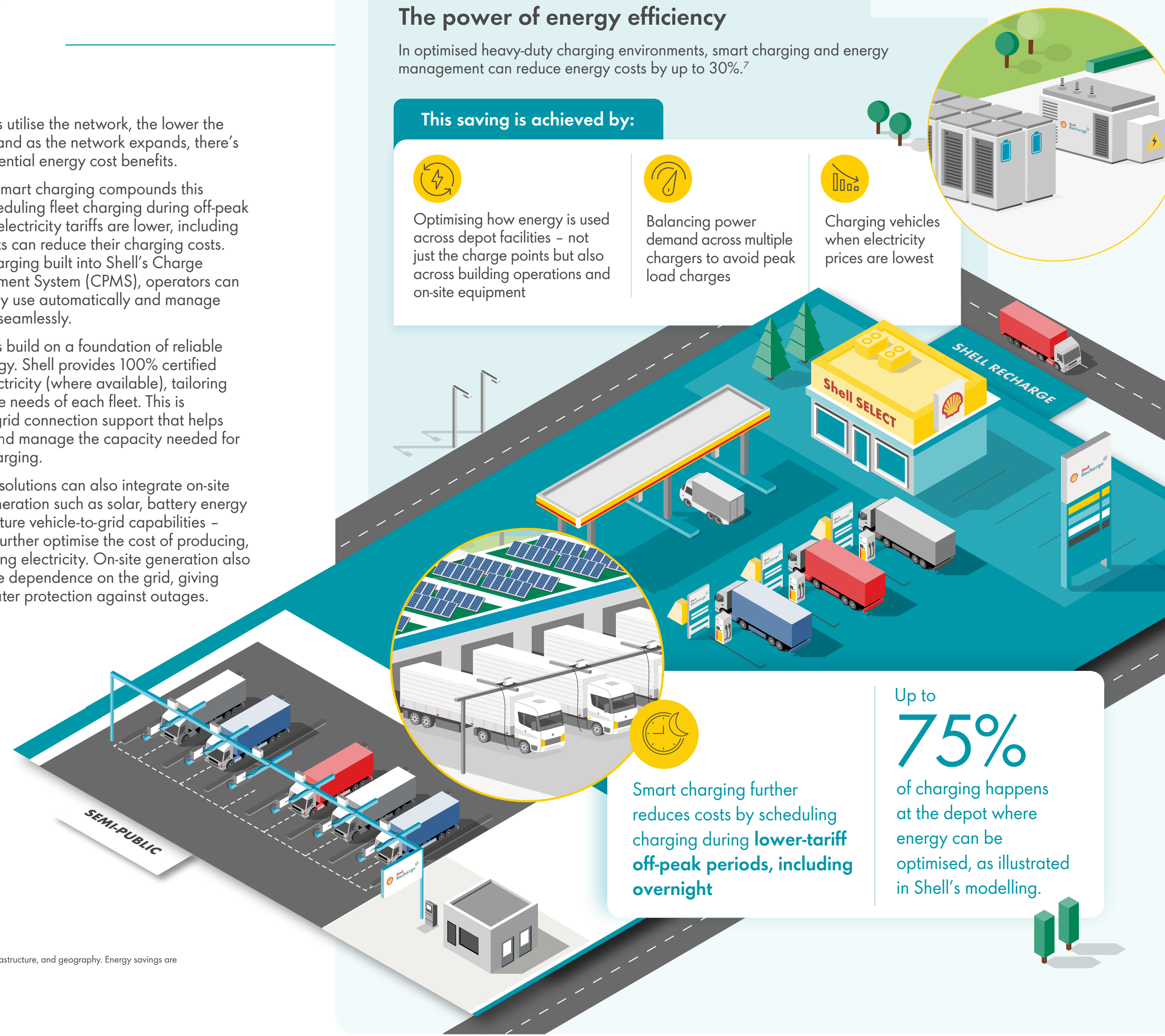
Optimising how energy is used across depot facilities – not just the charge points but also across building operations and on-site equipment



Balancing power demand across multiple chargers to avoid peak load charges



Charging vehicles when electricity prices are lowest



Smart charging further reduces costs by scheduling charging during **lower-tariff off-peak periods, including overnight**

Up to
75%
of charging happens at the depot where energy can be optimised, as illustrated in Shell's modelling.

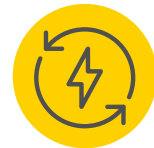
⁷ The actual savings are highly dependent on the customer use case, other customer inputs such as energy prices, cost of infrastructure, and geography. Energy savings are estimated using the Gridcog web-based tool for energy optimisation.

⁸ ICCT "Total Cost of Ownership: Trucks in Europe," 2023.

Access that enables revenue generation and energy savings

Without an integrated charging network, fleets can't access the mechanisms that generate revenue or reduce energy costs – meaning electrification remains a cost, not an advantage.

To reduce TCO, fleets need access to



Depot facilities that enable shared charging with other fleets and revenue generation



Charging locations that support lower-cost energy and optimised charging



Market incentives such as toll advantages and EV credit schemes

However, access alone is insufficient. These benefits can only be realised when charging infrastructure is effectively integrated into day-to-day operations. If electric vehicles cannot be deployed seamlessly within existing routes and schedules, the underlying economic advantages are significantly diminished.

Charging solutions must therefore be designed around real-world operating conditions — aligning infrastructure with route planning, vehicle utilisation and scheduling requirements to ensure consistent operational performance.

How Shell's charging network unlocks access to TCO savings

Shell helps to lower the TCO of electric trucking through an integrated charging network that connects:

- private depots;
- semi-public fleet locations; and
- public charging infrastructure in one unified system.

This includes working with fleets to assess site requirements and design charging solutions aligned with real-world duty cycles, ensuring that depots are built to support the operational demands of heavy-duty transport.

Fleets can then deploy infrastructure in phases using scalable, all-in-one heavy-duty charging solutions such as Shell PowerPack 500. These allow operators to install the infrastructure they need today while retaining the flexibility to scale as demand grows.

Shell's commercial modelling helps operators understand which structure works best for their business. This includes Energy-as-a-Service models, which help fleets structure their infrastructure investment to reduce or defer upfront capital costs – paying instead through the energy consumed.

Hardware innovations, such as liquid-cooled technology, help maintain consistent charging performance under sustained load, ensuring reliable and predictable charging speeds – critical for fleets operating on tight schedules.

Beyond the depot, Shell's growing network of public and semi-public charging locations across Europe helps fleets electrify their existing routes without compromising operational continuity.

At the centre of this integrated network is Shell Card, which provides access to charging across all private, semi-public and public locations (including roaming sites) through a single authentication and payment solution.



Together, these elements create a connected charging system that unlocks access to lower-cost energy, revenue opportunities and structural market advantages – reducing total cost of ownership.



Reducing costs through regulatory advantage

A structural shift is underway in road freight, as EU markets introduce tangible incentives for zero-emission trucks.

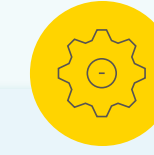
By supporting this shift, Shell helps fleets reshape the economics of electrification and gain a cost advantage over diesel in key markets.



EV credits

In the Netherlands, electric truck charging generates Energy Recognition Credits, which Shell helps to claim on behalf of customers and shares the value with them – removing the administrative burden.

Under Shell's modelling, these credits offer a significant way to offset energy costs over five years – further strengthening the overall TCO advantage.



Emissions trading

From 2027, the EU's Emissions Trading System for Buildings and Road Transport (ETS2) will require fuel suppliers to purchase carbon allowances for road transport – which will be passed on to operators as higher diesel prices.

Due to their zero tailpipe emissions, battery-electric trucks fall outside the scope of ETS2 and are less exposed to these additional diesel-related costs.



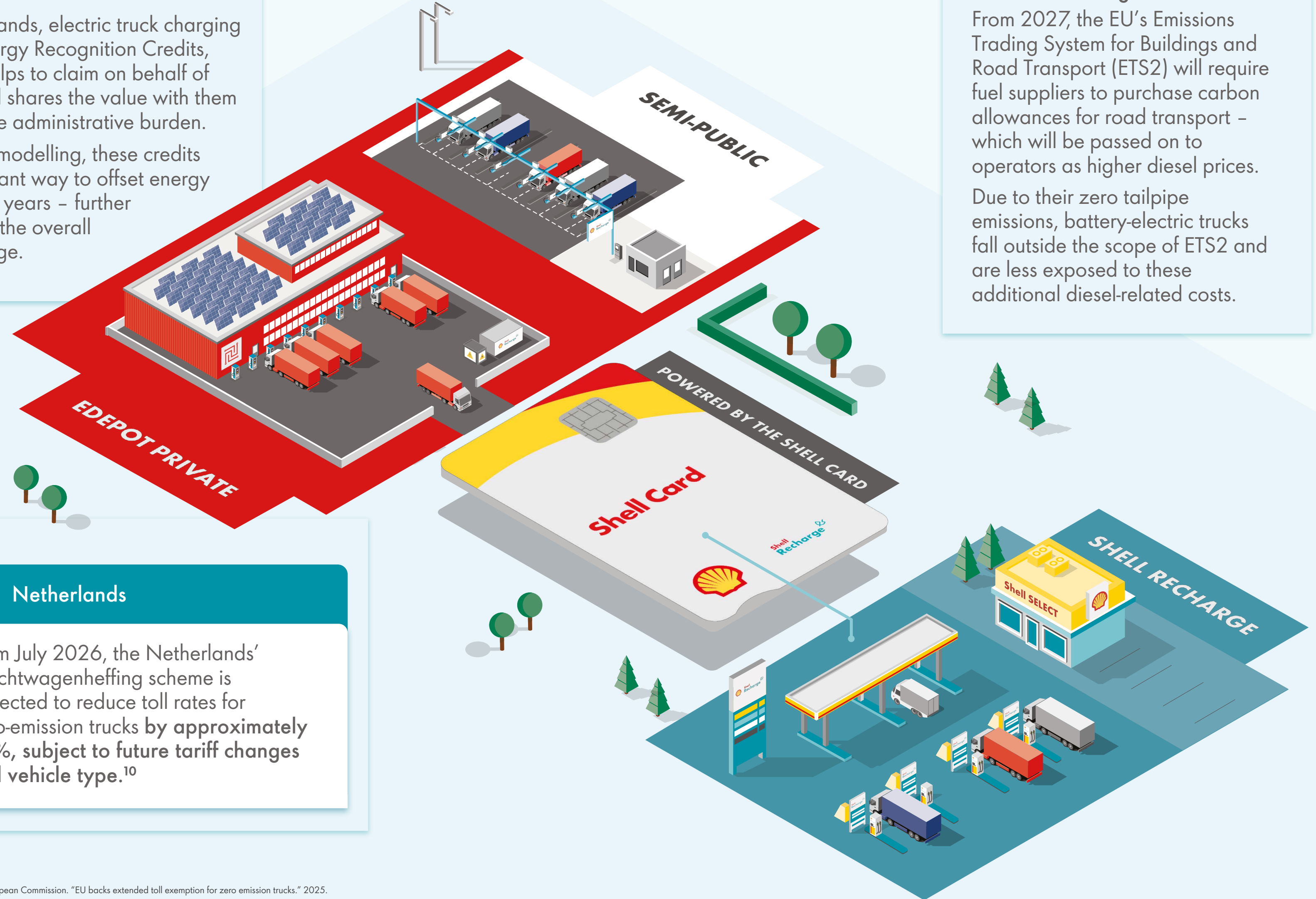
Road tolling

Germany

Electric trucks are exempt from Germany's MAUT heavy-duty vehicle toll until at least 2031.⁹ Based on Shell's modelling, a truck driving 116,000 km a year with 75% of mileage on toll roads could **save more than €150,000 over five years.**

Netherlands

From July 2026, the Netherlands' Vrachtwagenheffing scheme is expected to reduce toll rates for zero-emission trucks **by approximately 80%, subject to future tariff changes and vehicle type.**¹⁰



⁹ In 2025, the EU extended the full exemption for zero-emission heavy-duty vehicles from road tolls until 30 June 2031 under the Eurovignette Directive: European Commission. "EU backs extended toll exemption for zero emission trucks." 2025.

¹⁰ When comparing a CO2 emission class 5 truck (€0.038/km) with a Euro 6+ diesel truck (€0.197/km), both with a maximum mass of >32 tonnes: RDW (Netherlands Vehicle Authority). "You will pay this amount." N.D.

The Shell TCO model

The model referenced throughout this report was developed by Shell to compare the cost of operating electric and diesel heavy-duty trucks under real-world conditions.

Without an integrated charging system, electrification would still represent a cost barrier for many fleets. Shell's model shows that when shared charging revenue, energy optimisation and access to market-based incentives are combined, this barrier can become a cost advantage – enabling fleets to achieve up to 10% lower TCO compared with diesel.¹¹

10%

Shared charging revenue and energy optimisation can reduce electric truck TCO by up to 10% versus diesel.¹¹

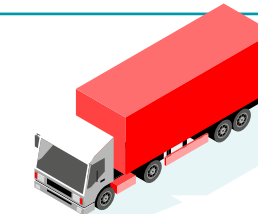
¹¹ Potential TCO outcomes are based on Shell's model for a heavy-duty truck operating 116,000 km/year over 5 years, assuming a semi-public, energy-optimised eDepot with 75% private and 25% on-the-go charging. Estimated savings come from third-party eDepot use, Smart Charging energy cost reductions, and preferential network pricing, based on market references (excluding grid upgrades). Actual results will vary by market, vehicle type, and customer-specific factors such as energy prices, infrastructure costs, utilisation, and location.

Our baseline for electric trucking

The Shell TCO model is built on the following assumptions:



Truck specification



40-tonne
tractor unit



Annual mileage

116,000 km
per year

580 km per day | 80% utilisation
250 operating days



Assessment period



5 year
operating lifecycle



BEV charging mix

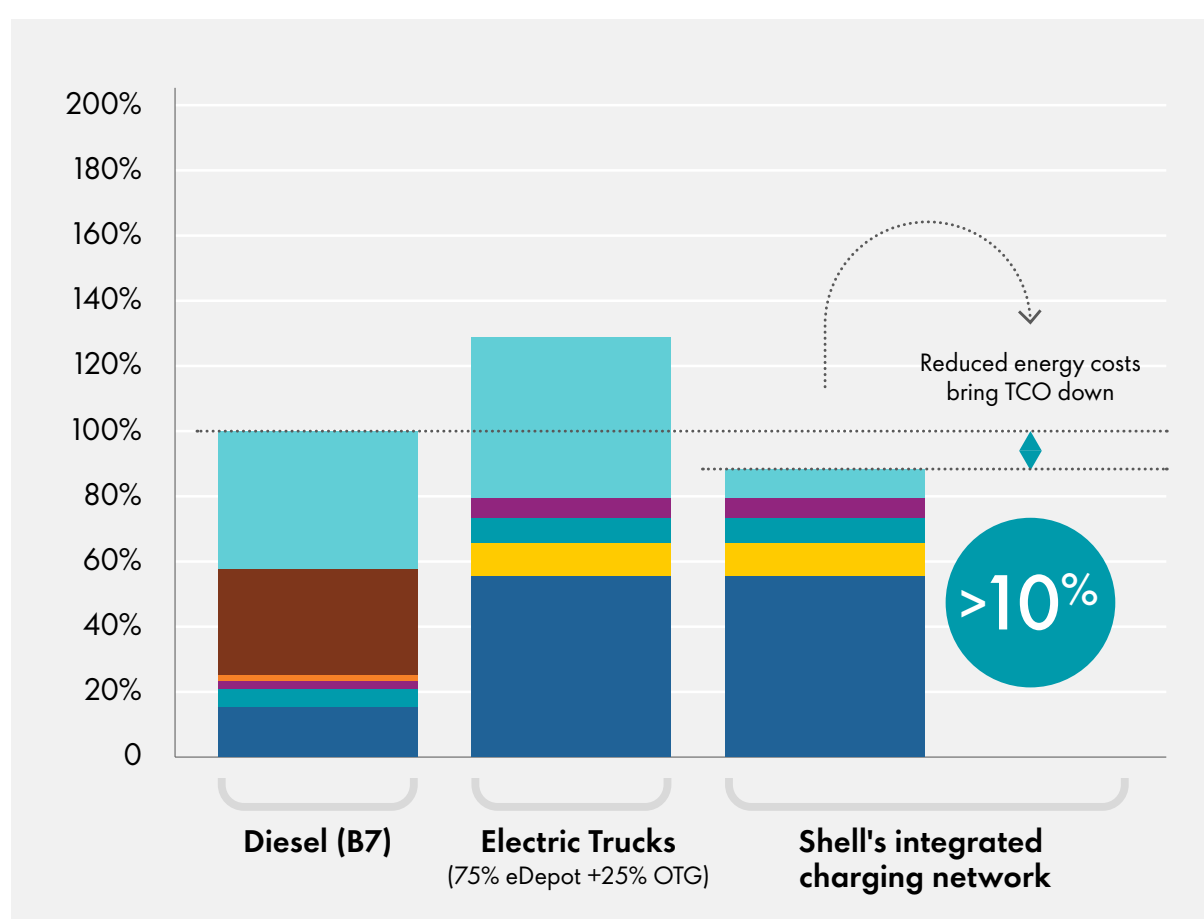
75% depot-based charging

25% public on-the-go charging

How the Shell TCO model works – market by market

The charts below illustrate how the economics of integrated charging play out in three key markets.

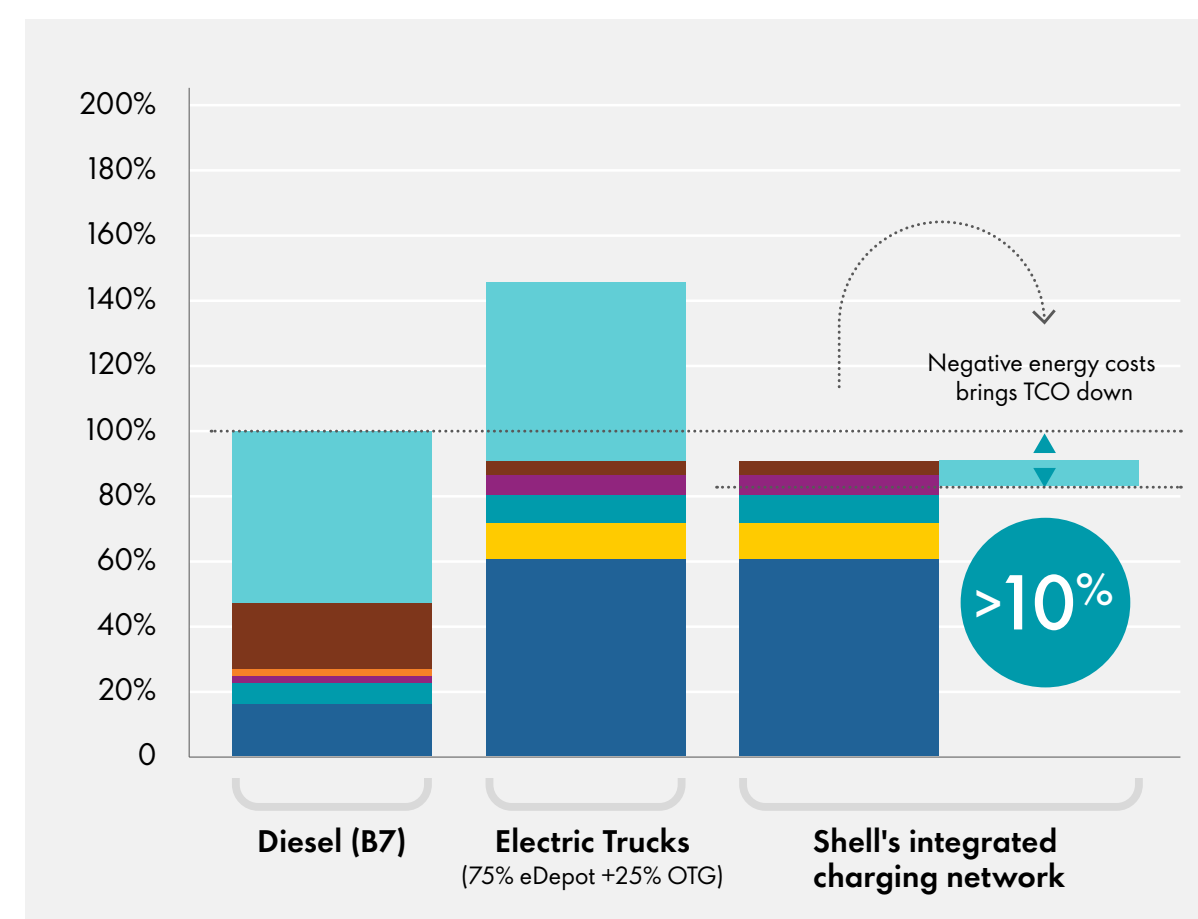
Germany



Electric trucks in Germany already benefit from structural regulatory advantages, including **exemption from the MAUT road toll for zero-emission vehicles**.

This policy significantly narrows the cost gap between diesel and electric trucks. In the modelled scenario, Shell's integrated charging network then improves the economics further through smart charging optimisation and shared infrastructure utilisation.

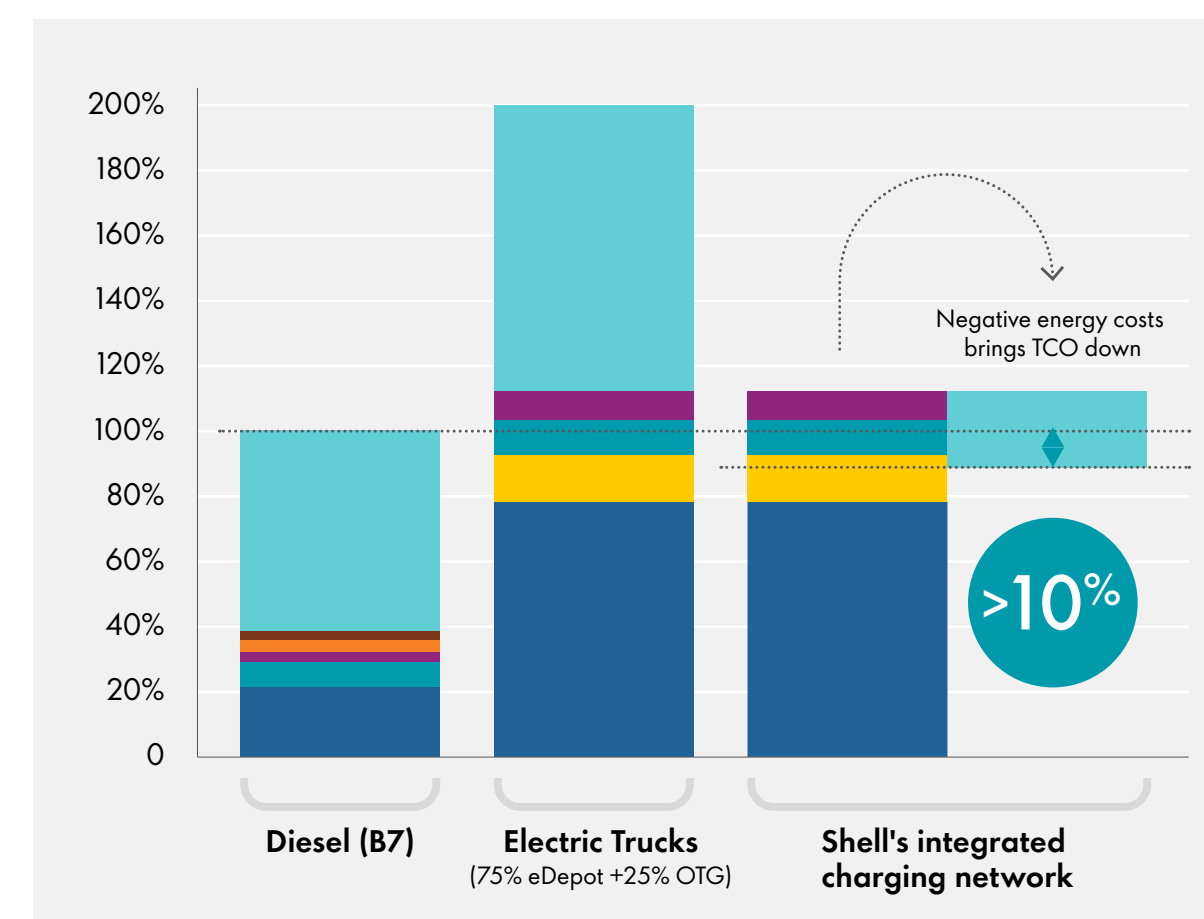
Netherlands



In the Netherlands, electrification benefits from both favourable tolling policy and energy incentives.

Electric truck charging generates Energy Recognition Credits, which Shell claims on behalf of customers and shares the value with them. In the modelled scenario, **these credits contribute more than €76,000 over five years** – strengthening the overall TCO advantage by contributing to negative energy costs.

UK



The economics of electric trucking work differently in the UK.

Unlike Germany and the Netherlands, the UK does not operate kilometre-based tolling that advantages zero-emission trucks. Without an integrated charging system, BEV costs remain significantly higher than diesel.

Revenue from semi-public charging, combined with smart charging optimisation and network pricing, **plays a very important role in achieving the 10% TCO advantage in the UK because it's the primary mechanism**.

Key

- Fuel/Energy cost
- Road toll/Road tax
- AdBlue
- Vehicle insurance cost
- Vehicle maintenance cost
- Vehicle finance/Interest vs. Diesel
- Vehicle cost

Assumptions

- 116,000 km/year
- 5 years,
- 75% depot charging
- 25% OTG charging

The TCO is first calculated for the total customer fleet & eDepot, assumed 4 eTrucks with 4 charge points on the Depot (which they use themselves at night, and are opened to the public during the day). The TCO figures extrapolate the full TCO for a TCO for 1 truck only.

Why fleets should act on electrification now

The economics of electric trucking are improving rapidly – but waiting carries its own strategic and financial risks.

Fleets that begin electrifying their operations today are expected to be better positioned as regulatory pressure on diesel increases. For example, from 2027, the EU’s Emissions Trading System for Buildings and Road Transport (ETS2) is expected to increase diesel costs as carbon pricing is passed through the fuel supply chain.

Alongside staying ahead of changing regulations, early adopters can potentially begin generating revenue sooner through semi-public charging. They are also expected to be better placed to benefit from the improved economics of Shell’s network as more fleets electrify and the number of shared charging sessions increases.

Electric trucking is no longer a cost barrier or a future consideration. Under the right conditions, it’s already a competitive advantage.

The first to move will be the first to see the value.

Build your fleet’s business case

Every fleet operates under different conditions – from routes and utilisation to depot infrastructure and energy access. That means the most important question isn’t whether electric trucking can achieve a lower total cost of ownership. It’s whether it can do so for your fleet.

The TCO model presented in this report reflects a specific operating scenario. To understand how these dynamics apply in your business, you can model your own TCO using Shell’s calculator.

By entering a small number of operational inputs, you can stress-test your current TCO assumptions to see how your fleet could beat diesel on total cost.

See what the numbers look like for your fleet (in just a few minutes)

If you’d like to explore your results in more detail, Shell’s team can work with you to refine assumptions and model a full transition plan.

Click here to use Shell’s TCO calculator



Why operators should work with us



60+ years of experience

Shell Fleet Solutions and SBRS combine more than 60 years’ experience in fleet payments and fuel cards with specialist engineering capability to support electric trucking at scale.

This is supported by Shell’s fast-growing public charging network in Europe, which provides access to:

- 50 Shell Recharge heavy-duty fleet sites
- 150 dedicated and hybrid roaming sites
- 3,000+ direct current (DC) fast chargers at depot sites across more than 100 cities in 11 countries

Engineering expertise

SBRS brings dedicated heavy-duty engineering expertise and continuous innovation to the design and deployment of scalable charging infrastructure, helping fleets keep pace with rapidly evolving vehicle technologies and charging standards.

Integrated network

Together, Shell Fleet Solutions and SBRS help fleets make financial sense of electric trucking by building an integrated charging network designed to shift electrification from a cost barrier to a cost advantage.

Shell Recharge PowerPack 500: A cost-effective route to electrification

Bundled solution

PowerPack 500 is a modular DC charging solution, purpose-built for heavy-duty fleets, offering a scalable, all-in-one system to start the electrification journey. It combines Shell’s PowerHub 500 hardware with a bundled offer including a charge point management system (CPMS), Shell Card and a standard service and maintenance contract to help fleets simplify deployment.

Continuous performance

Engineered specifically for electric trucks and long service life, Shell’s PowerHub 500 charger is designed to charge heavy-duty trucks back-to-back at full power over a wide ambient temperature range - ensuring predictable performance.

Network advantage

The solution provides an ideal route to Shell’s wider integrated European network through Shell Card, helping fleets to unlock additional revenue streams and reduce total cost of ownership (TCO) by up to 10% compared to diesel while expanding their own route charging options.¹²



¹² Potential TCO outcomes are based on Shell’s model for a heavy-duty truck operating 116,000 km/year over 5 years, assuming a semi-public, energy-optimised eDepot with 75% private and 25% on-the-go charging. Estimated savings come from third-party eDepot use, Smart Charging energy cost reductions, and preferential network pricing, based on market references (excluding grid upgrades). Actual results will vary by market, vehicle type, and customer-specific factors such as energy prices, infrastructure costs, utilisation, and location.



Find out if your fleet can beat diesel on total cost

The 10% TCO advantage is real — but every fleet's numbers are different. See what the model looks like for yours.

Enter a few operational inputs in Shell's TCO calculator and compare your fleet with diesel in minutes.

Calculate your TCO →

Want a deeper analysis? Shell's team can work with you to refine assumptions, model a full fleet transition plan and build a business case tailored to your operations.

Speak to our team - <https://www.sbrs.com/contact>

Shell Fleet Solutions and SBRS — helping fleets make financial sense of electric trucking.



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