2025

Arval Mobility Observatory

UNDERSTANDING TOTAL COST OF OWNERSHIP (TCO):

2025 OUTLOOK & STRATEGIC LEVERS FOR MANAGING IT.

EXECUTIVE SUMMARY

The Total Cost of Ownership (TCO) represents a financial estimate intended to help buyers and owners determine the direct and indirect costs of a product or a service over its entire lifecycle. This whitepaper focuses on vehicle and fleet TCO.

Since 2020, the TCO has experienced a dramatic increase – up to 30%. This rise is driven primarily by inflationary pressures on all components of the TCO: vehicle prices, energy, labour, financing costs etc. Consequently, fleet managers have entered a new cost environment, one that demands a re-evaluation of traditional assumptions and contract structures. This whitepaper provides a comprehensive breakdown of TCO fundamentals, a data-driven view of cost evolution and equips decision-makers with strategic levers to regain control over costs – while continuing to progress on electrification goals.

The aim is to deliver the following key insights:

- A clear breakdown of TCO concepts most relevant to fleet operations
- A detailed analysis of TCO evolution from 2020 to 2025 using Arval Consulting data
- A benchmark comparison of TCO across different powertrains – specifically battery electric vehicles (BEV) vs internal combustion engine (ICE) vehicles
- A simulation of fleet-level TCO evolution to illustrate how cost shifts materialise over time, particularly in light of contract renewal cycles
- Actionable mitigation strategies and best practices

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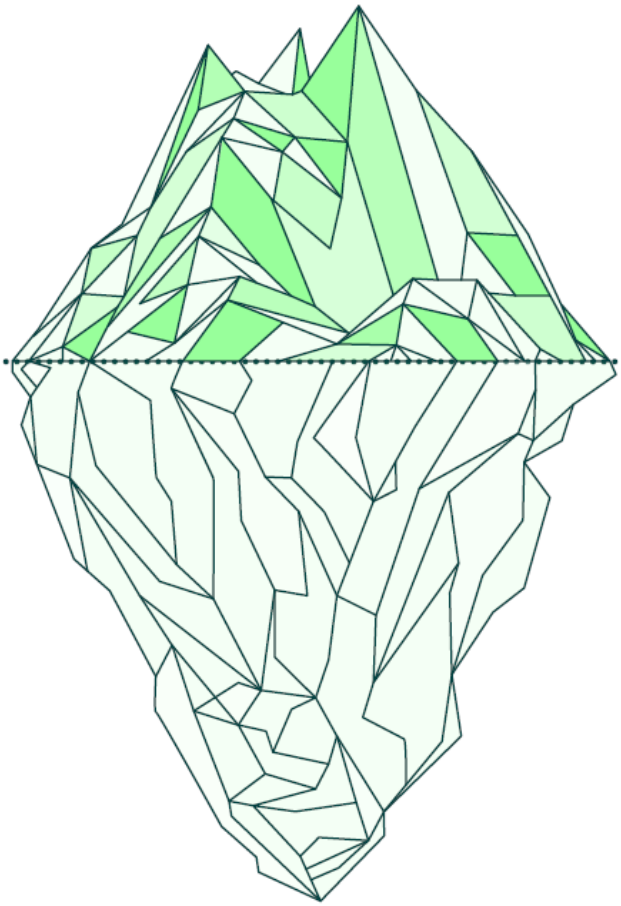
01/ UNDERSTANDING TCO: KEY CONCEPTS FOR FLEET MANAGEMENT

VEHICLE TCO

TCO represents the full economic costs associated with procuring, operating, and maintaining the vehicle over its lifespan or a specific ownership period. Vehicle TCO provides a level cost analysis per unit.

Vehicle level TCO components can be represented as follows:

Full Economic Costs



FIXED COSTS

- Depreciation
- Financing
- Services (Maintenance, Assistance, Insurance)

VARIABLE COSTS

- Energy consumption
- Taxes
- Road taxes
- Bonus and Malus
- State incentive or penalty
- Fiscality

...AND MORE

The distribution of TCO components for each energy type can be found in Chapter 3, page 13.

In some countries, **corporate taxes**, such as non-recoverable VAT or non-deductible depreciation, play a dominant role in the determination of the TCO. In this case, they can be added to the calculation, resulting **in Total Cost of Ownership including corporate tax**, which gives an extended measure of the actual cost for the organisation.

Combining the above factors provides the **Vehicle TCO,** which can be represented on a yearly or monthly basis. Vehicle TCO is a key indicator that enables decision-makers to make informed trade-offs between different vehicle and powertrain options.
A key component of TCO is vehicle depreciation, which is reflected both in the monthly lease rate and the TCO calculation for purchased vehicles. In a leasing model, the leasing provider forecasts the residual value (i.e. the expected resale value at the end of the contract). The residual value risk is assumed by the leasing provider, rather than the fleet manager. This offers clients improved cost predictability and facilitating access to newer powertrains without long-term exposure to resale value fluctuations.

FLEET TCO

Managing fleet TCO implies considering the aggregated and often more complex costs of managing an entire vehicle portfolio. This broader view introduces new variables, such as administrative costs and operational unpredictability, which are critical to understanding the true cost of running a fleet. These charges are incurred during the life of a contract and are difficult to predict when procuring a single vehicle.

Charges Include:

- ✓ Out-of-contract tyre replacements (following puncture or accident).
- ✓ Insurance costs excluded from the insurance policy:
  - Days for short-term rental/relief vehicle
  - Additional charges not covered by the policy
  - Damage repairs after an accident
- ✓ Mechanical repairs, whether due to unexpected technical failures or improper use of the vehicle, such as lack of oil, not respecting the preventive maintenance plan, engine repair or due to a wrong refuelling product (diesel vs. petrol) etc.
- ✓ Administrative fleet management costs.
- ✓ Unfair wear and tear of the car, which translates into refurbishment costs when returning the car at the end of a lease or declining resale value when the vehicle is purchased.
- ✓ Excess mileage charges and other end-of-lease contract settlements.

Parking and tolls are usually excluded from the vehicle TCO as they are linked to unpredictable usage or trips. Charging station or fuel/gas station costs and their installation charges are also excluded from the vehicle TCO; however, they should be considered in an energy transition plan as an additional cost for the company.

Defining an energy charging strategy (from home, office or public) is essential to steer energy consumption and optimise related costs.

Calculating the TCO also helps fleet managers to set KPIs, such as the TCO per kilometre, allowing measurement and benchmark efficiency across vehicle types and use cases.

Beyond the concept of TCO, the Total Cost of Mobility (TCM) extends the measure of costs by including other mobility services, such as car sharing, public transportation, bike leasing, etc. TCM supports a broader definition of mobility beyond individual cars. It represents the "real" or "estimated" cost of mobility for a dedicated individual or employee and takes into consideration the total cost of commuting and professional mobility.

02/ EVOLUTION OF TCO: FACTORS FROM 2020 TO 2025

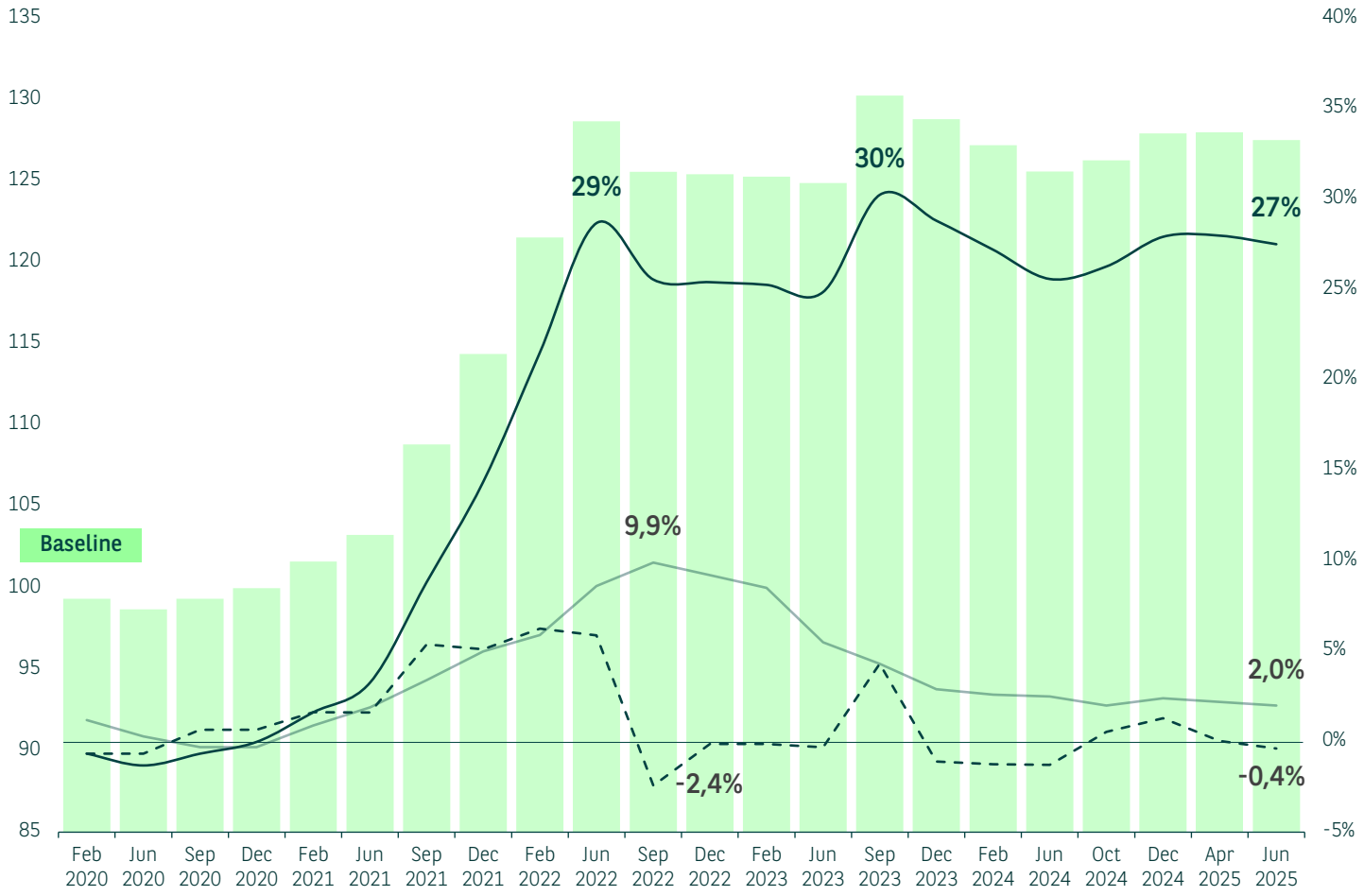
OVERVIEW

Between 2020 and 2025, vehicle TCO has increased by 27% – a significant rise that peaked at 30% in 2023. Arval Consulting has observed via its TCO Index a structural increase across every major cost component, reshaping the economics of fleet management.

TCO Index Evolution In Europe

- Quarterly Analysis from Feb 2020 to Jun 2025
- Areas covered: 15 countries in Europe
- Vehicle types: PCs & LCVs in all segments
- Based on +50,000 Arval quotes per period

27% **Increase in vehicle TCO** in Jun 2025 baseline Jan 2020



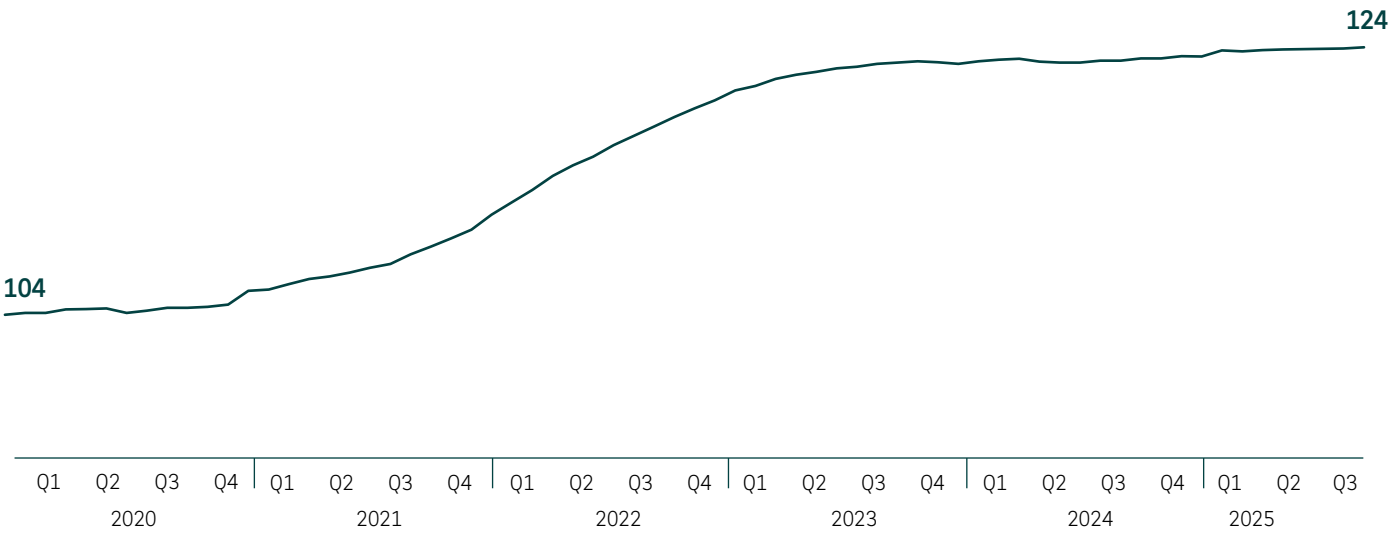
Source: Arval Consulting TCO Index, September 2025 issue with June 2025 data

KEY TRENDS & DRIVERS

As explained in chapter 1, TCO is heavily impacted by external factors. This section provides trends on the main causes of TCO's drastic increase related to the catalogue price of the vehicle, the interest rate, as well as the energy price of both fuel and electricity.

Vehicle List Price Inflation

- Vehicle list price indexed to 100 in 2015
- Data from Q1 2020 to Q3 2025



Source: *Harmonised index of consumer prices (HICP) – Eurostat, September 2025*

The average vehicle prices surged by 19% from 2020 to 2025 due to several factors, including global inflation, OEM portfolio shifts from entry-level models to an increased SUV penetration, and widespread integration of advanced safety, infotainment, and electrification features such as the price of batteries.

19% **Vehicle list price increase** from 2020 to 2025

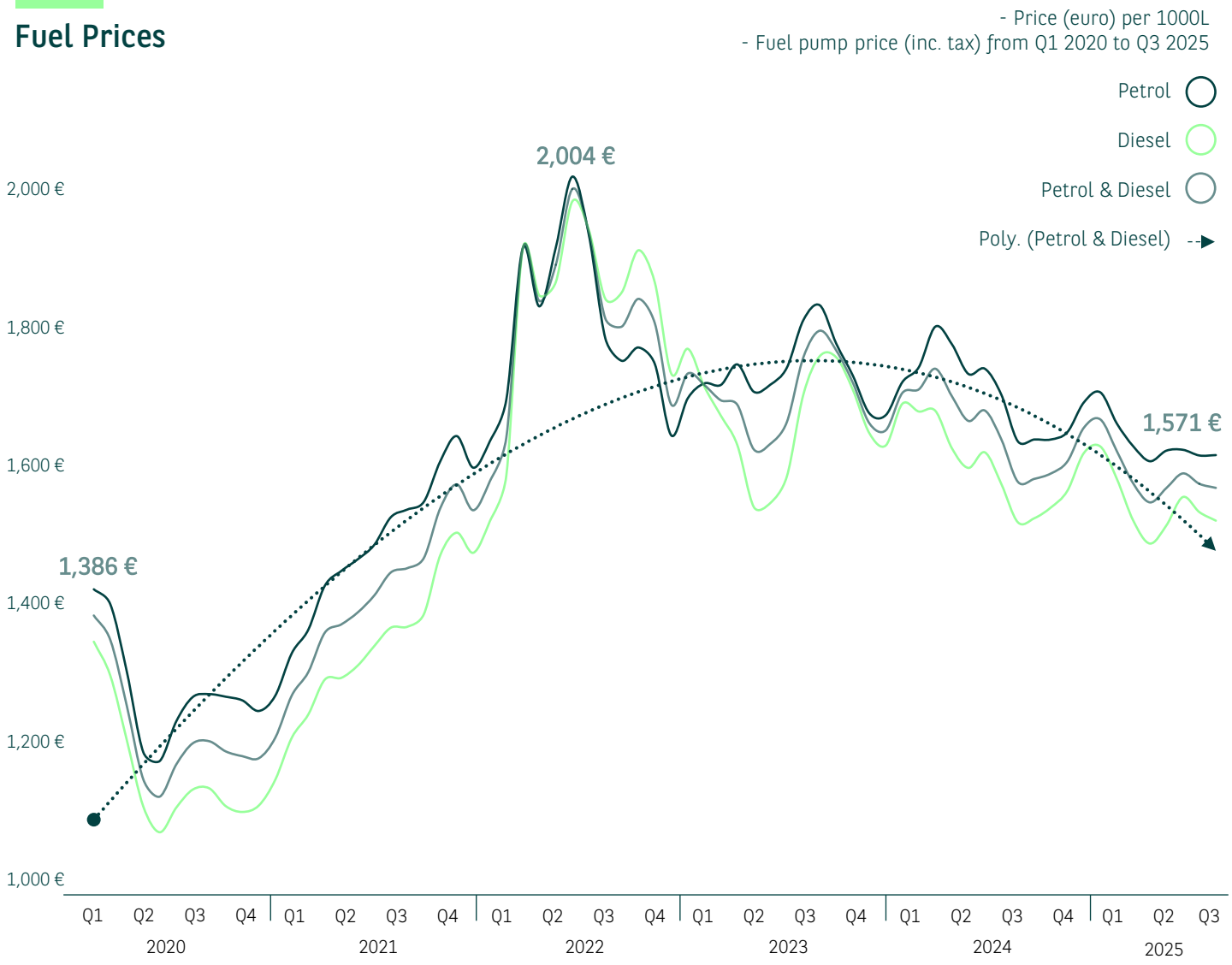
The introduction of stricter **CAFE (Corporate Average Fuel Economy)** norms across Europe has directly influenced the powertrain mix offered by OEMs. To meet CO_2 targets and avoid regulatory penalties, manufacturers have shifted production toward BEVs and plug-in hybrids and reduced the number of affordable ICE models.

This shift has created upward pressure on vehicle list prices, as BEVs and SUVs (with typically higher prices) represent a growing share of new vehicle offerings. For fleet managers, this change contributes to a structural increase in TCO.

ENERGY PRICE VOLATILITY

Fuel costs can constitute up to 30% of vehicle TCO for ICE vehicles, depending on usage patterns, fuel efficiency and market prices. Global supply shocks and geopolitical tensions have caused significant fluctuations in fuel prices, resulting in an average increase of 32% from 2020 to 2025.

Fuel Prices



Source: *Weekly Oil Bulletin - European Commission, September 2025*

32% **Increase in average fuel prices** from 2020 to 2025

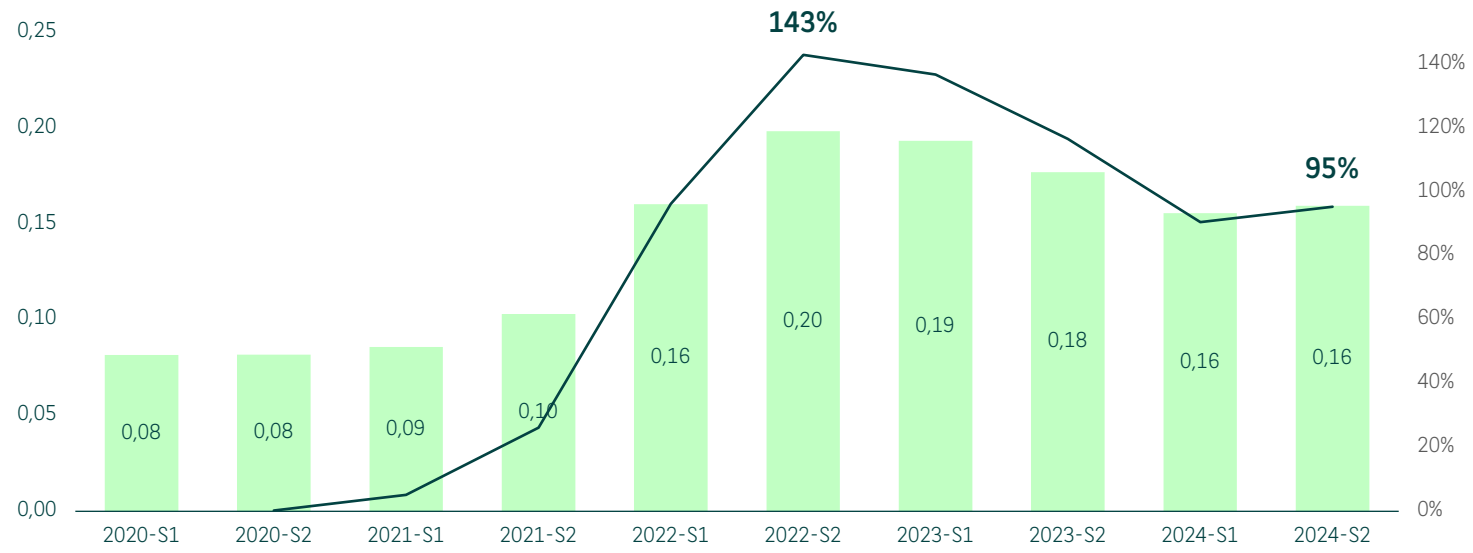
Electricity Prices

80% **Median increase in electricity prices** between non-household and household consumers

Electricity prices have also risen significantly in many countries, resulting in a 70% increase for household customers in the EU between 2020 and 2024.

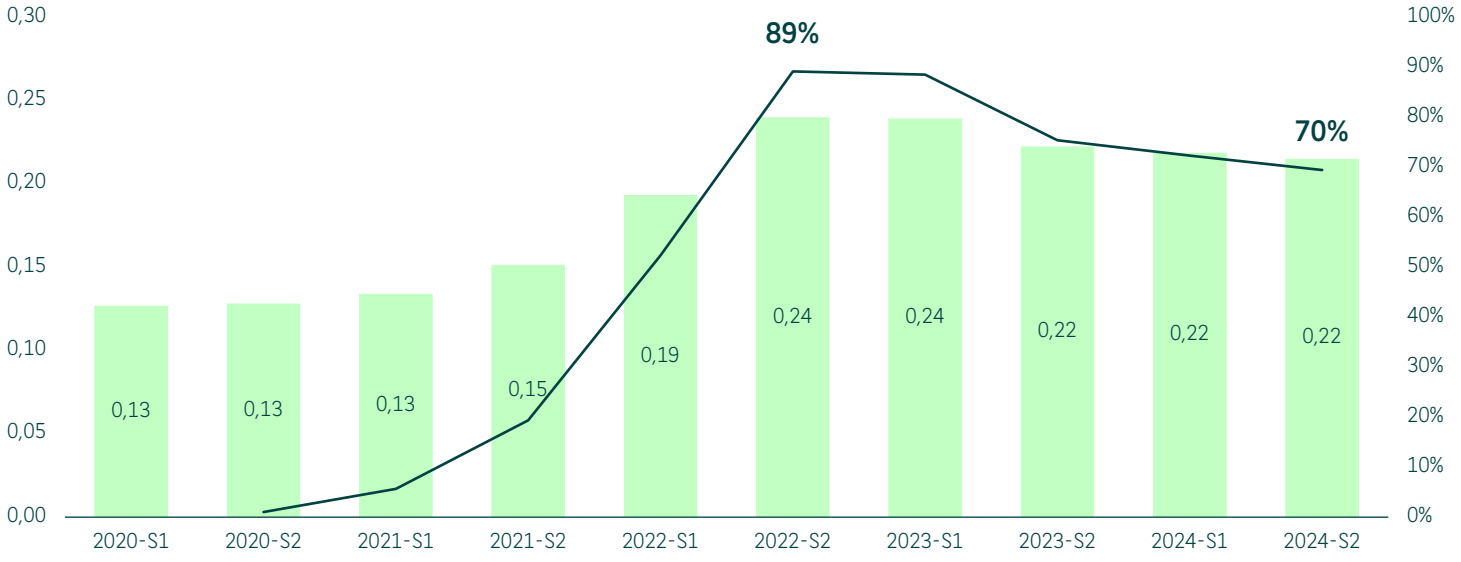
- Bi-annual data from S1-2020 to S2-2024
- Areas covered: 27 countries (Europe)

For non-household consumers



Source: Electricity prices for non-household consumers - Eurostat, April 2025

For household consumers



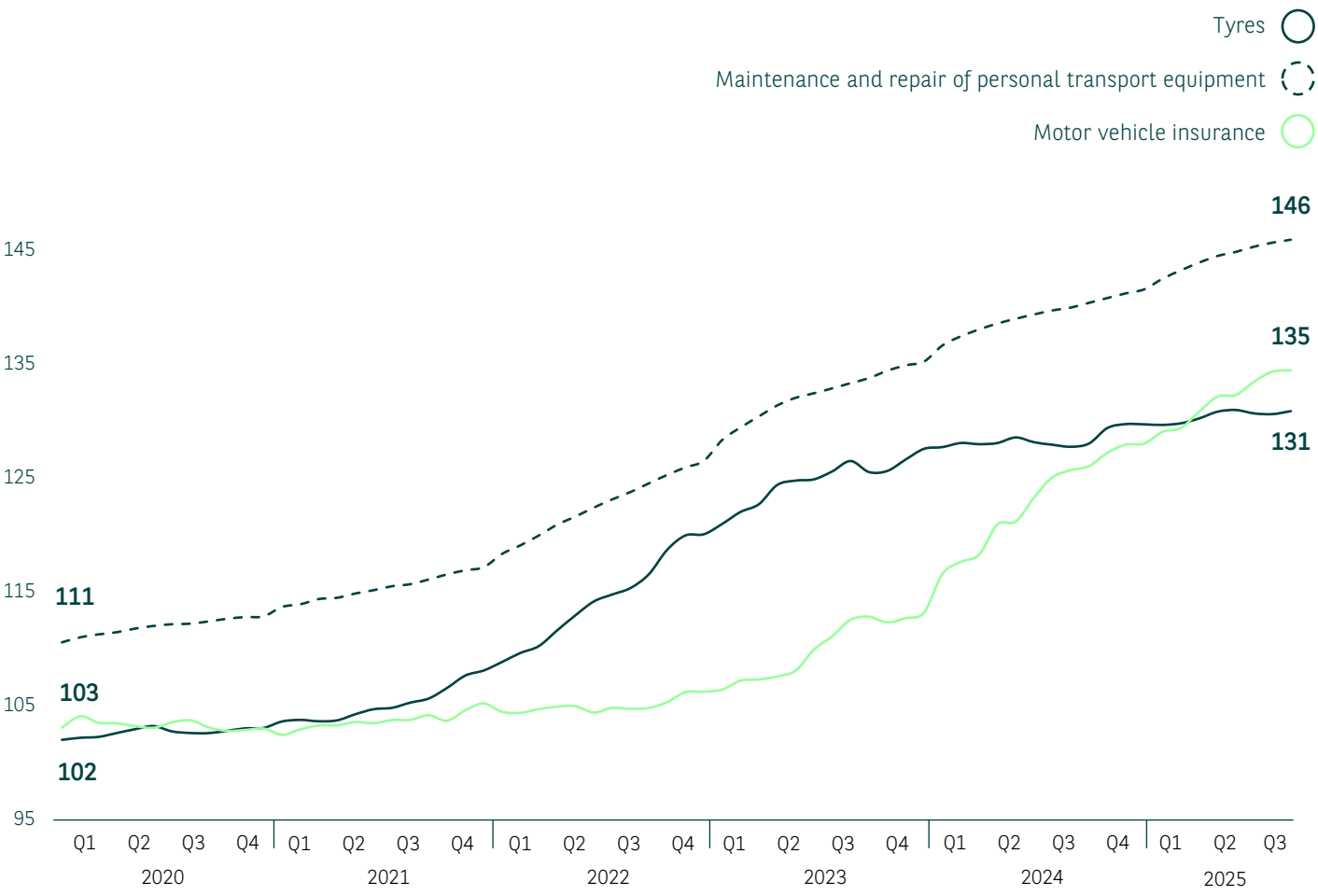
Source: Electricity prices for household consumers - Eurostat, April 2025

OPERATING COSTS

Maintenance costs have increased by 29% on average between 2020 and 2025 due to labour cost inflation, spare parts supply chain bottlenecks, and the rising complexity of newer vehicles.

Operating Costs

- Vehicle operating cost factors indexed to 100 in 2015
- Data from Q1 2020 to Q3 2025



Source: *Harmonised index of consumer prices (HICP) – Eurostat, August 2025*

29% **Increase in average maintenance costs** from 2020 to 2025

27% **Increase in average vehicle insurance & tyres costs** from 2020 to 2025

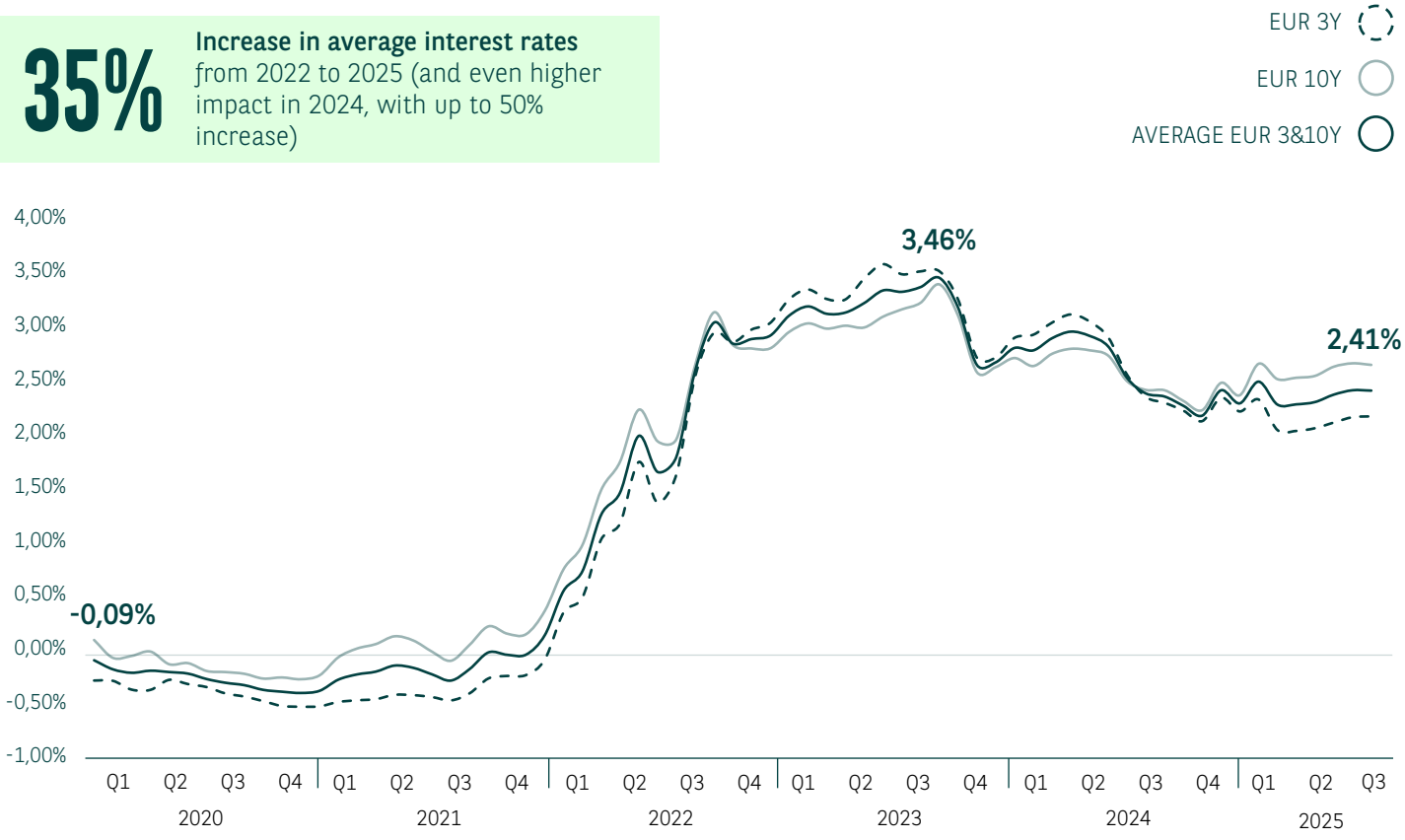
FINANCING COSTS

Interest rate hikes have driven up leasing rates, especially for long-term contracts signed post-2022, with a 35% increase in average interest rates from 2022 to 2025.

Average Interest Rates

- EUR 3Y & 10Y interest rate swaps (Proxy for financing costs)
- Data from Q1 2020 to Q3 2025

35% **Increase in average interest rates** from 2022 to 2025 (and even higher impact in 2024, with up to 50% increase)



Source: Investing.com, September 2025

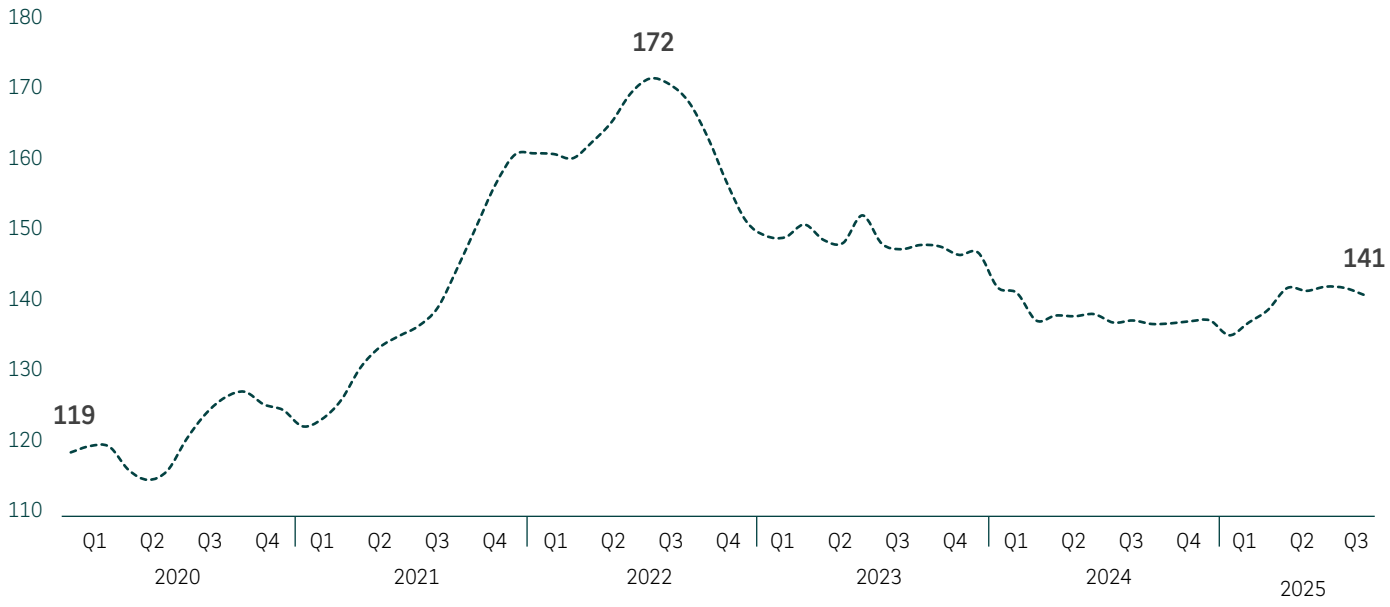
USED CAR MARKET EVOLUTION

Used car prices have experienced high volatility, marking a huge increase between 2019 and 2022, and then constantly decreasing, before stabilising since 2024..

For instance, BEV used car prices have fluctuated due to concerns about battery lifespan and degradation, phase-out of government incentives, and rapidly evolving technology. This affects depreciation sharply and, by extension, the TCO.

Used Car Price Index

- Used car prices indexed to 100 in 2015
- From Q1 2020 to Q3 2025



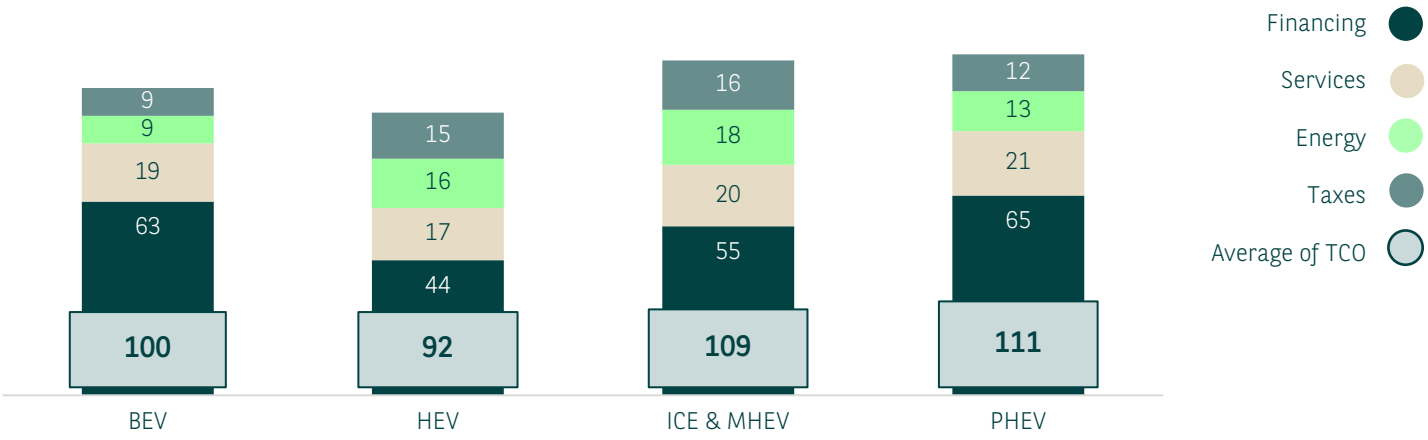
Source: *AUTO1 Group Price Index, August 2025*

03/ TCO COMPARISON - ICE VS BEV

With fleet electrification accelerating across the globe, fleet managers are increasingly evaluating the cost implications of choosing between BEVs and ICE vehicles. While list prices of BEVs remain higher, their lower running and maintenance costs are shifting the TCO balance. To demonstrate these differences, this chapter benchmarks the TCO across powertrain types in the highly relevant C and D segment passenger cars, which represents a large share of active corporate fleets.

BEV Vs ICE Vehicles TCO Comparison

- Values are indexed to TCO of BEVs as 100
- Based on 27,000 Arval quotes **of C & D segment** Passenger cars
- Average contract duration of 46 months and mileage of 106,000 kms
- Areas covered: 15 countries in Europe

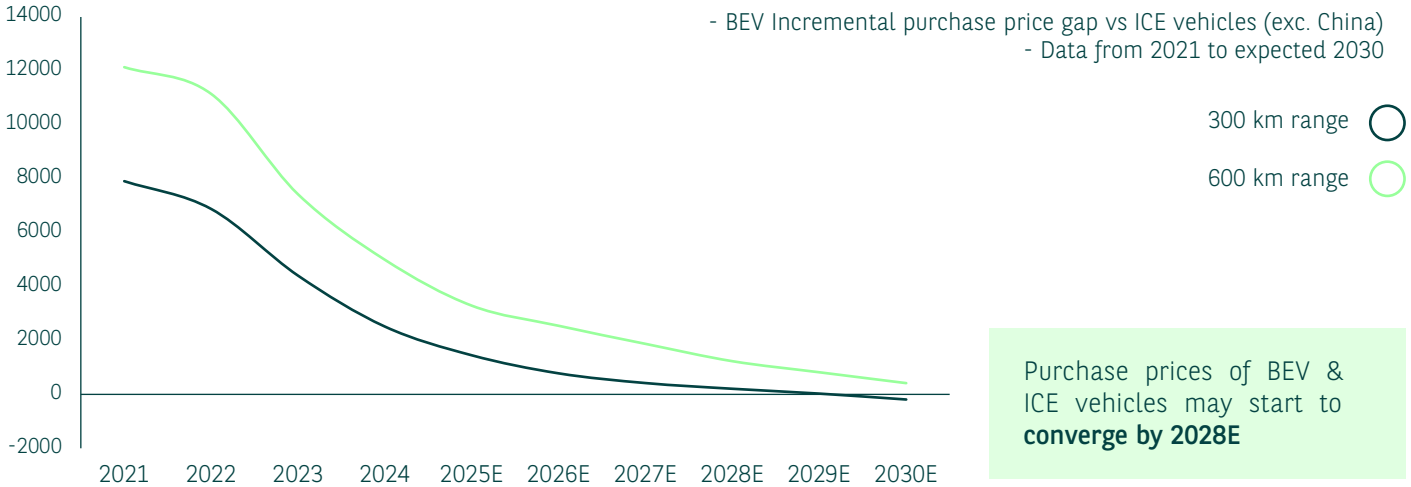


Source: Arval Consulting TCO Index, September 2025 issue with June 2025 data

Up to now, BEV's TCO has been negatively impacted by their prices which are higher than ICE's. However, with recent developments in battery technologies and scaling of industrial production capacities, purchase prices of BEVs are expected to drop – potentially reaching cost parity with their ICE counterparts by 2028 (government incentives excluded), according to BNPP Exane, though in some models this convergence could occur sooner.

Purchase Price Gap Between BEV Vs ICE Vehicles

- BEV Incremental purchase price gap vs ICE vehicles (exc. China)
- Data from 2021 to expected 2030



Purchase prices of BEV & ICE vehicles may start to **converge by 2028E**

Source: BNP Paribas Exane, May 2025

BEVs generally require less maintenance due to the absence of mechanical components (like engines or clutches) and oil related pumps, pipes and filters, leading to further cost savings. Studies show that within the first 50,000 miles, BEV maintenance and repair costs were 57% lower than ICE vehicles*. Over longer periods, the maintenance cost gap widens, making BEVs a more cost-effective choice than ICE for fleet operators.

Although electricity prices in the EU rose more rapidly than fuel prices between 2020 and 2024, energy costs typically account for a smaller portion of the vehicle TCO in BEVs. This is generally around 10-15%, compared to fuel costs representing up to 25-30% for ICE vehicles. This translates into a lower energy cost per kilometre for EVs. The more distance driven, the more cost-attractive BEVs are compared to ICE.

** EV.com, June 2024 - BEVs vs ICEs: Total Cost Of Ownership | EV.com*

Government incentives and tax benefits are significantly improving BEV TCO, but they tend to progressively phase out of the European legislative landscape. However, in many countries, the tax deductions available for BEVs surpass those granted for ICE vehicles.

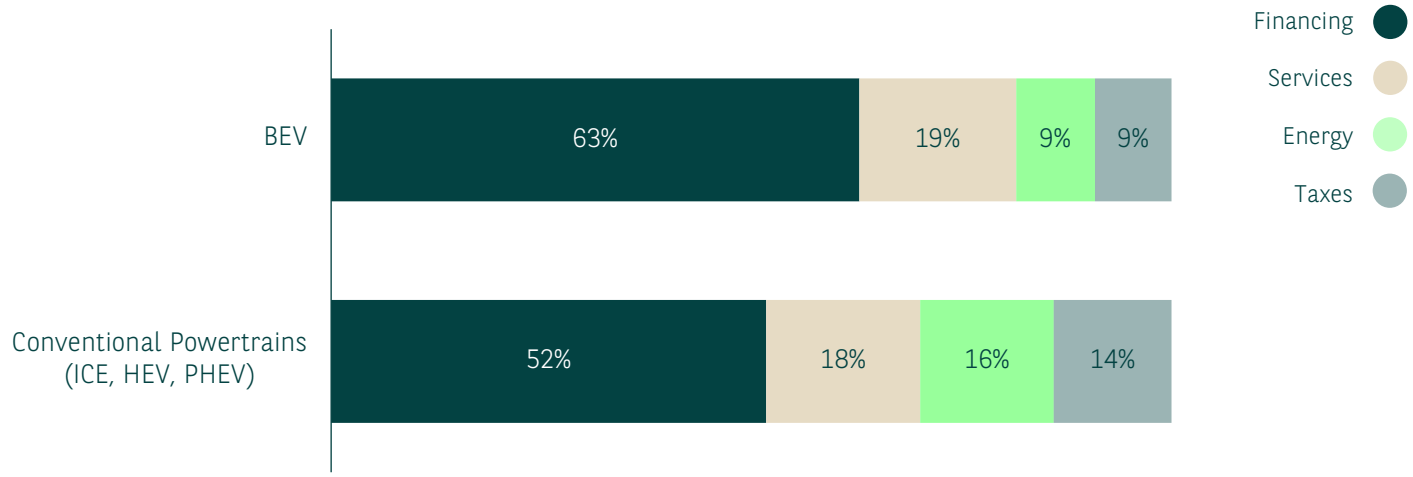
KEY TAKEWAY

The TCO gap between BEV and ICE vehicles is shrinking rapidly and in several European countries, BEVs already outperform ICEs in total lifecycle cost. BEV TCO is expected to become even more favourable as technology matures and residual values improve.

Despite higher upfront costs, the TCO breakdown shows that BEVs benefit from lower energy, maintenance, and tax expenses, making them, on average, a more cost-effective and sustainable choice over time. Typically, the distribution of these costs across different powertrains is as follow:

Average TCO Breakdown

- Based on 27,000 Arval quotes of **C & D segment Passenger** Cars
- Areas covered: 15 countries in Europe
- Average contract duration of 46 months and mileage of 106,000 kms



Source: Arval Consulting TCO Index – September 2025 issue with June 2025 data

04/ SIMULATING FLEET SPEND EVOLUTION

As shown in the previous sections, most TCO components have risen significantly in recent years and many companies have yet to experience the inflationary impact due to existing contracts signed under pre-2020 pricing. The cost increases will materialise progressively as these contracts come up for renewal.

TOTAL FLEET SPEND EVOLUTION 2020-2025

To better understand the dynamics behind fleet cost evolution during this period of transition, we simulated two scenarios. We used historical vehicle TCO data from 2020 to 2025 for a virtual corporate fleet of 3,500 C & D-segment* passenger cars, operating in 5 specific countries - **France, Germany, Italy, the Netherlands, and the UK:**

- **Scenario 1:** No electrification (100% ICE vehicle fleet)
- **Scenario 2:** Gradual electrification from 0% BEVs in 2020 to 50% by 2025 (≈10% YoY increase)
- **Lease contract duration:** 48 months

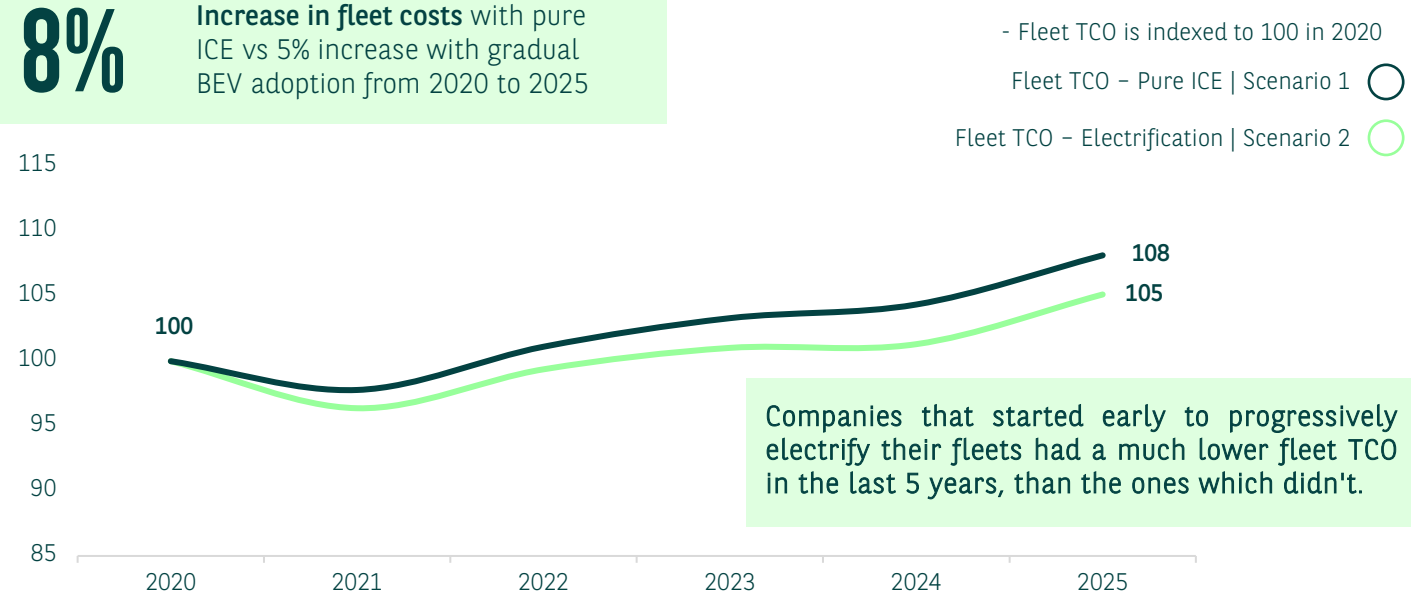
For our scenario modelling, we applied the relevant historical vehicle TCO for each contract renewed, based on linear renewal cycle, to simulate the evolution of the fleet TCO. For example, in our 2nd scenario, even though the average vehicle TCO increase for the C & D segment for both BEV and ICE initiated in 2020 and renewed in 2024 have experienced a 16% increase, the impact on the Fleet TCO is lower, as in our simulation we "renew" 25% of the fleet every year (with 10% BEV and the rest ICE).

The chart below illustrates the indexed fleet TCO evolution for both scenarios over the 2020–2025 period. Both scenarios show a comparable upward trend, with the electrified fleet slightly outperforming the ICE fleet in terms of TCO. This supports the conclusion **that cost increases are more a function of macroeconomic inflation than the result of fleet electrification.**

Overtime, the average TCO gap increased in favour of BEV. This is explained by favourable governmental incentives and acceleration of BEV adoption in the fleet simulated.

Fleet TCO Evolution 2020-2025 in %

8% **Increase in fleet costs** with pure ICE vs 5% increase with gradual BEV adoption from 2020 to 2025



Companies that started early to progressively electrify their fleets had a much lower fleet TCO in the last 5 years, than the ones which didn't.

Source: Arval Consulting, September 2025

**To remain consistent with other comparisons in this paper, C&D segments are used as they are highly representative of corporate fleets*

Future improvements in BEV technology and increasing regulatory pressure could lead to BEV cost deflation, making electrification an even more advantageous long-term strategy.*

These results focus exclusively on operating expenses (OPEX). They do not account for the capital expenditures (CAPEX) required to support BEV adoption – particularly the cost of installing charging infrastructure at homes or offices. During the initial transition phase, these investments may offset part of the OPEX benefits of BEVs. However, once infrastructure is in place, BEVs can unlock their full cost-efficiency potential.

Focusing only on short-term visibility may underestimate the true cost risk looming over the fleet's next renewal cycle. Companies that delay fleet strategy reviews may face unexpected cost shocks over the next 12–24 months. Without proactive intervention, these renewals can destabilise budgets and mobility planning.

** These projections are based on historic cost trends and inflation assumptions. Future TCO evolution may vary depending on future market volatility, changes in fiscal policies and unpredictable geopolitical events.*

05/ MITIGATION STRATEGIES: TOOLS TO REGAIN CONTROL OF TCO

A proactive, data-driven approach preserves progress on electrification and sustainability while ensuring financial efficiency. This section outlines five key strategies to contain TCO without compromising strategic goals.

1/ RIGHT VEHICLE SELECTION AND RIGHTSIZING

Choosing the right vehicle for each driver profile and use case is fundamental. Fleet operators should avoid **multiple specifications** by aligning vehicle segments, models, and equipment with actual usage requirements. Significant savings can be made by selecting the right vehicle segmentation, body type such as sedans over SUVs.

2/ CONTRACT OPTIMISATION

Tailoring lease contracts, both in terms of duration and mileage, can reduce monthly costs. Leases of 60 months or more have a lower TCO, with average savings of 5-10% in the case of extending the contractual lease duration from 36 months to 60 months. Especially for BEVs, the higher initial investment is amortised more effectively with extended use. Lower operational expenses, reduced road taxes, and energy savings contribute to greater affordability over time.

3/ DRIVER IMPACT: PROMOTE ECO-DRIVING

The driver behaviour has an impact on 60% of the TCO components and, therefore, plays a direct role in fuel/energy consumption and vehicle wear and tear. Companies should invest in eco-driving training and telematics to monitor real-time data, reduce idling, and promote smarter routing. These actions can directly translate into lower operational costs and longer vehicle lifespans.

4/ CHARGING STRATEGY

A well-planned electrification strategy is both sustainable and cost-effective. Gradually introducing BEVs and PHEVs across relevant vehicle segments, supported by internal TCO data, can justify their use where financially viable. Providing home and workplace charging solutions, along with fair reimbursement policies, is essential to ensure smooth adoption.

5/ EXPLORE ALTERNATIVE MOBILITY MODELS

Companies can also pilot alternative models such as mobility budgets or flexible-term leases. These alternatives help reduce reliance on traditional vehicle ownership while enhancing flexibility, cost efficiency and sustainability.

Leasing used vehicles also helps reduce TCO by leveraging lower depreciation costs compared to new vehicles. Since used cars have already lost much of their initial value, monthly rentals are typically smaller. Additionally, insurance and taxes are often lower for used vehicles, further decreasing TCO. While maintenance needs may be higher with used ICE vehicles, careful selection and proactive/predictive maintenance can minimise these costs.

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CONCLUSION

In today's rapidly transforming automotive landscape, TCO is, more than ever, an important tool for effective fleet management. With rising costs, shifting powertrain technologies, and evolving regulatory pressures, understanding TCO is no longer optional, it is essential.

TCO provides a comprehensive view of both visible and hidden costs, empowering fleet managers to make informed, strategic decisions. It enables better trade-offs between vehicle choices, energy types, contract durations, and usage patterns. As fleets diversify, TCO serves as a reliable compass for balancing operational needs with long-term cost efficiency.

This holistic approach is key to navigating the profound shifts the automotive sector is undergoing.

Ultimately, TCO is not just a calculation, it's a strategic asset.

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