Arval Consulting

BATTERY ELECTRIC VEHICLES (BEVs) FOR FLEETS: CHASING THE MYTHS AROUND BEVs

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ARVAL
BNP PARIBAS GROUP

For the many journeys in life

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INTRODUCTION

Despite a slowdown over the past year, electric vehicle adoption in the Europe is still going strong: For 2024, the market share of Battery Electric Vehicles (BEVs) was at 12.6% of all new car registrations, with slightly more than 712,500 BEV registered in the first half of the year (a 1.3% increase from 2023).

With an ever wider array of models available, growing autonomy, faster and more widely available charging stations, fleet managers have more opportunities than ever to decarbonize their fleets.

However, several common misconceptions still persist, especially around costs, range, charging, and the environmental impact of BEVs.

In this report, we're aiming to dispel those myths and equip you with the data you need to address stakeholders' most common concerns. This way, you'll be able to start (or continue) your transition to electric fleets confidently, reducing their environmental footprint, at the pace that makes the most sense for your business.

MYTH 1: "ELECTRIC VEHICLES ARE TOO EXPENSIVE"

Fact: BEVs' Total Cost of Ownership (TCO) is 10% lower than that of ICE (Internal Combustion Engine)/hybrid vehicles

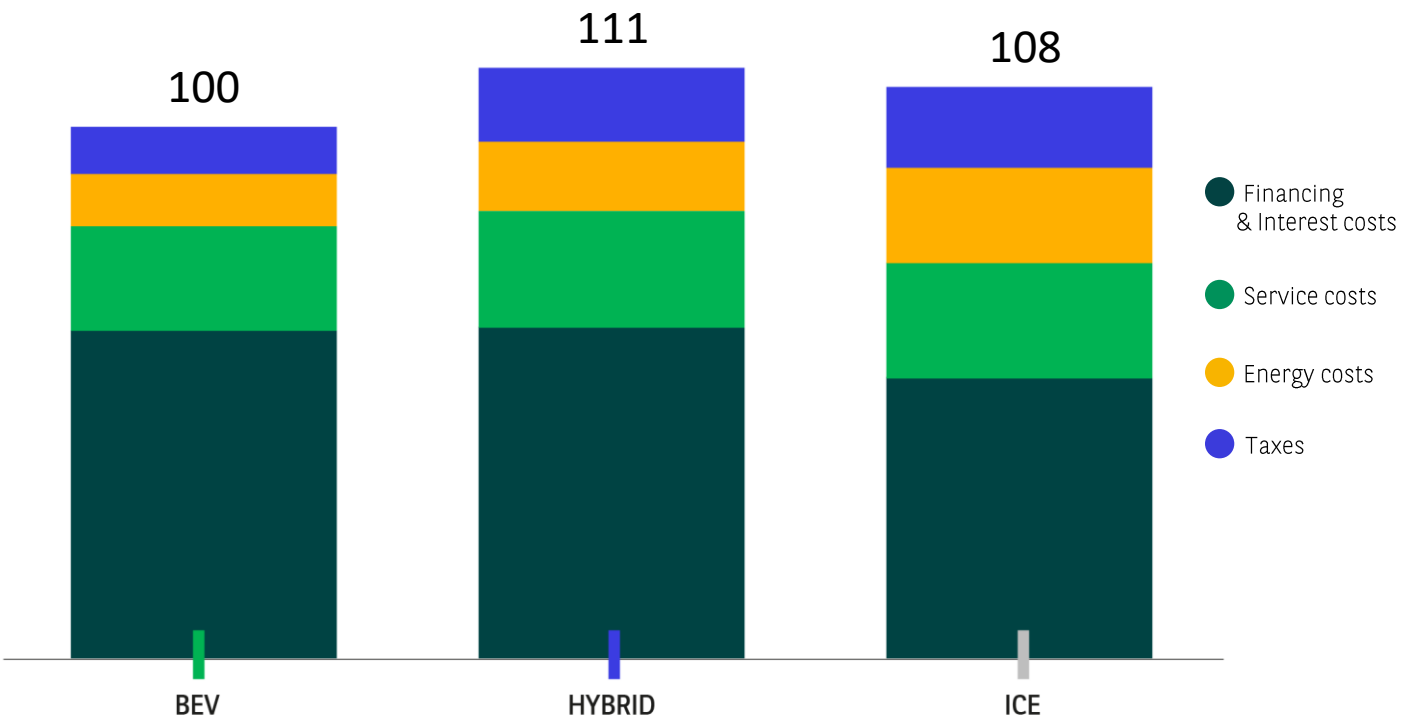
The idea that BEVs are prohibitively expensive largely ignores their total cost of ownership (TCO).

BEVs often do have higher upfront costs – although this gap between BEVs and ICE vehicles is decreasing – but they offer significant savings over time due to lower energy costs, maintenance, and service expenses.

Lower TCO: A key advantage

BEVs' total cost of ownership is about 10% lower than of hybrid and ICE vehicles, which can be mostly attributed to energy cost savings and lower maintenance costs:

COMPARATIVE TABLE OF TCO SPLIT BY TYPE OF ENGINES



Total cost of ownership for BEVs, hybrid vehicles (PHEV, HEV & E-REV), and ICE vehicles indexed 100 for BEVs. Contracts with average duration of 45 months and a yearly mileage of 29,000 km. Source: Arval

In the chart, you can find the details of each vehicle's total costs split by category, with BEVs' energy expenses being 42% lower than ICE cars and 21% lower than hybrid vehicles.

This TCO calculation is based on a mix of home, office, and public charging. With home charging, which typically offers more attractive pricing options, the costs could be lower.

The cost of the battery representing 20 % to 30% of the total cost of the vehicle. Battery prices are forecasted to continue to drop due to the scaling of industrial production capacities and innovation in battery technology. Hence, the TCO of BEV will continue to improve over the years.

Find the right model to fit your budget needs

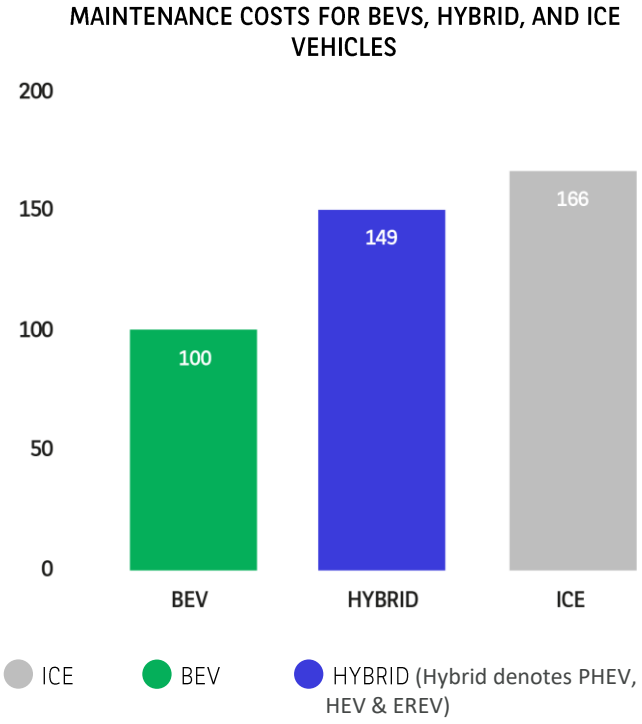
Keep in mind that, within the current BEV offer, there are significant variations in TCO. In the below table, you can notice the variation in TCO performance of 6 different Original Equipment Manufacturers (OEMs) for the most selling car segments. Choosing the right OEM and vehicle model ensures you'll be able to optimize both costs and operational performance, especially in high-mileage scenarios.

CAR SEGMENT vs OEMS	OEM 1	OEM 2	OEM 3	OEM 4	OEM 5	OEM 6
C SEGMENT I MEDIUM CARS	€ 856	€ 963	€ 1,079	€ 1,108	€ 1,142	€ 1,246
D SEGMENT I LARGE CARS	€ 1,178	€ 1,156	€ 1,213	€ 1,330	€ 1,300	€ 1,418

Above data is based on contracts with average duration of 45 months and a yearly mileage of 29,0000 km
Source: Arval

Maintenance costs

BEVs have fewer moving parts, requiring less upkeep than ICE or hybrid vehicles. Our data shows ICE vehicles have 66% higher **service, maintenance, and repair (SMR) costs** compared to BEVs, while hybrid vehicles' costs are 49% higher:

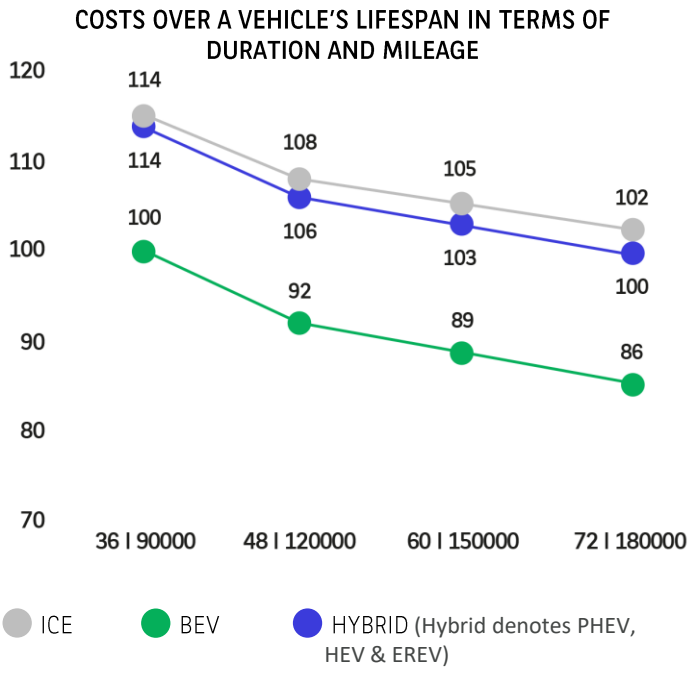


Source: Maintenance costs for BEVs, hybrid, and ICE vehicles - Arval

In addition, it is worth noting that annual SMR costs for BEVs remain flat whilst increasing exponentially over time for ICE. The resulting gap increases over longer periods, enhancing the competitiveness of BEVs compared to their ICE counterparts. Consequently, lower maintenance costs are an attractive factor for BEVs in the resale market.

Long-term cost performance

Lower maintenance cost leads to the TCO of BEV growing more and more favorable versus ICE with longer duration. Combined with a good performance of batteries over time (cf myth 4), extending BEV contract duration presents many advantages. Consequently, BEV used car present attractive operating costs compared to the ICE equivalent.



Source: Costs over a vehicle's lifespan in terms of duration and mileage - Arval

Governments incentives

Many European Union (EU) governments offer incentives to help offset the higher upfront costs of EVs, although some have been withdrawn. However, beyond incentives, the real lever for electrification is changing stakeholders' mindsets: Real long-term benefits come from reduced running costs and a lower environmental footprint, rather than potential
tax credits.

MYTH 2: "BEVs DON'T HAVE ENOUGH RANGE"

Fact: New models offer ranges of up to 960 kilometers on a single charge

Historically, range anxiety has been one of the main limiting factors for fleets. Many fleet managers fear that BEVs might simply not meet their day-to-day operational demands.

However, thanks to improvements in battery technology, the development of charging infrastructure, and the optimizations made possible by the use of telematics, range limitations today are, to a large extent, easy to overcome.

BEV ranges are constantly increasing

Many recent BEVs now offer ranges of 400 to 500 kilometers on a single charge – or, in some cases, up to 960 kilometers in mild city weather. This covers the large majority of use cases of fleets, enabling most BEVs to complete daily tasks without midday recharges.

Telematics help further ease range concerns

Telematics systems, which many BEVs have, offer real-time data on battery health, range, and driving patterns and enable you to monitor energy consumption based on payload, driving habits, and weather conditions. This means you can accurately plan vehicle usage based on needs, and increase operational efficiency across the board.

BEV route planner apps allow drivers to map out the most efficient route taking into account charging stops, and, if you use Arval's app, see real-time charger availability and status.

Driver profiling and use case analysis: Choosing the right BEV model for your needs

Driver profiling, i.e. understanding the specific needs and patterns of individual drivers, can help you select the right vehicle with appropriate range for each employee, and ensure range anxiety is a non-issue.

For this, you need to look into:

- Common and less frequent use patterns
- Habitual and maximum daily distance
- Type of routes – urban, highway, or a mix
- Payload requirements
- Charging station availability in your area
- Weather and average temperatures

For instance, a vehicle used primarily for short city trips with no payload would have different range needs from one used for long-distance deliveries in winter conditions.

MYTH 3: "CHARGING IS TOO COMPLICATED"

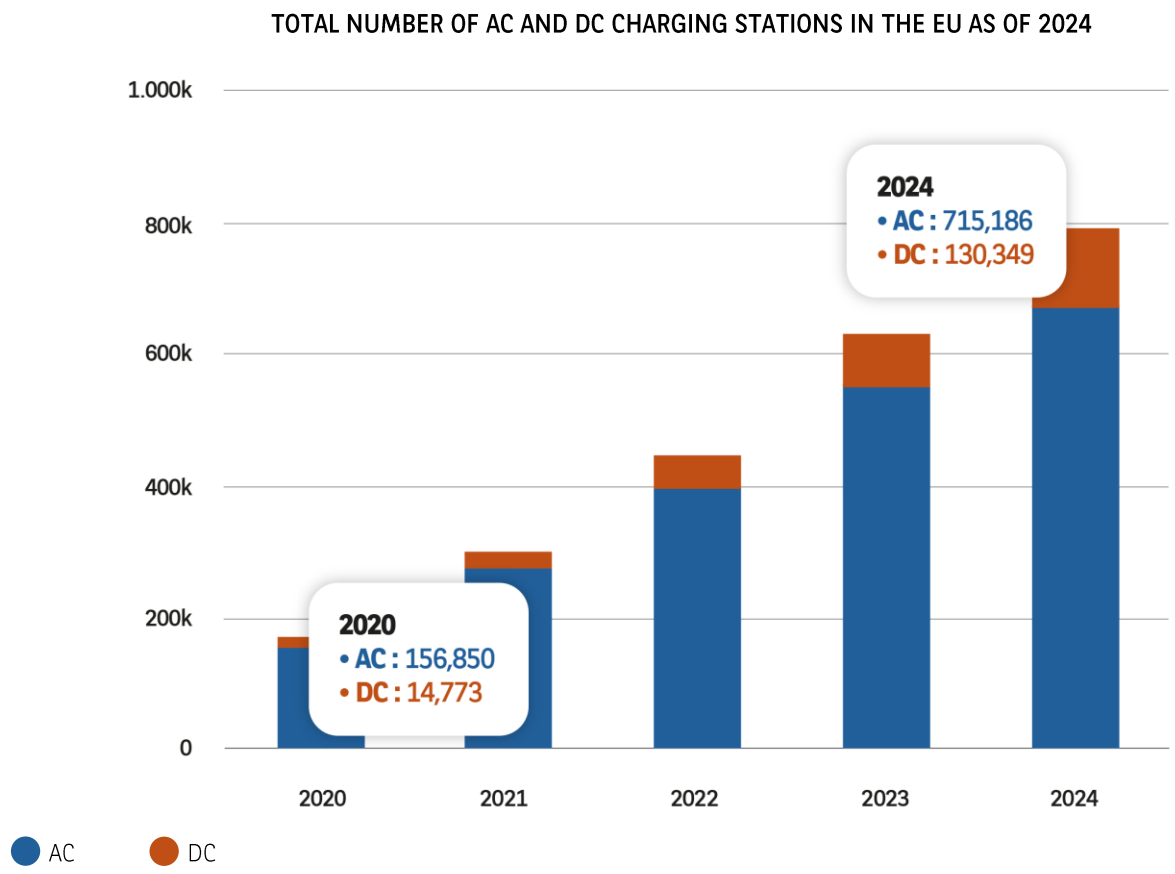
Fact: The number of charging stations in the EU grew significantly, from 172,000 in 2020 to 821,000 in 2024

Another common misconception is that charging electric vehicles is too complicated or unreliable.

However, the development of public charging networks, the improvements in fast charging technology, and strategic investments in workplace and home charging stations ensure this is no longer the case.

Charging infrastructure is improving

The charging network in the EU is rapidly expanding, with more than 715,186 AC and over 130,349 DC (fast) charging stations available across the bloc as of 2024:



Total number of AC (from 3 to 22 kW) and DC (from 22 to 350 KW) charging stations in the EU as of 2024.
Source: European Alternative Fuels Observatory

Major roads, shopping centers, parking lots, and urban areas are equipped with a dense network of charging points, making stations easy to find where you need them the most – to the satisfaction of 83% of EV drivers in France, across all types of public charging points. This further simplifies business travel, even at long distances.

In the EU, finding a convenient charging point is becoming easier by the year, with significant improvement in the ratio of number of EVs per charging stations (2.6 in 2022 to 1.8 in 2023). For example, a person driving from Cologne to Munich or from Amsterdam to Paris would not experience any problems charging on the road: Germany, The Netherlands, and France are the top 3 countries with the most charging stations in Europe.

In parallel to that, some EU governments are providing incentives and tax breaks for investments in charging infrastructure (see the ACEA tax benefits and incentives guide for more information).

Fast charging equals less downtime

Fast charging technology is constantly improving, currently allowing a vehicle's battery to be charged to 80% from empty in just 20 minutes to an hour, while ultra-fast charging can further reduce this time to less than 20 minutes.

ELECTRIC CAR CHARGING TIMES

Type of EV	Small EV	Medium EV	Large EV
Average Battery Size (right) **Power Outpuy** (Below)	**40 kWh**	**65 kWh**	**90 kWh**
AC 2.3 kW	11h36m	18h50m	26h05m
AC 7.4 kW	3h36m	5h51m	8h06m
AC 11 kW	11h36m	3h56m	5h27m
AC 22 kW	2h25m	1h45m	2h27m
DC 50 kW	1h08m	52min	1h12m
DC 100 kW	32min	26min	36min
DC 150 kW	16min	17min	24min
DC 240 kW		11min	15min
DC 300 kW		8min	11min

Source: Approximate time needed to charge an EV battery from 20% to 80% for different chargers and types of cars – EVBox

This is invaluable for fleets where vehicles are in constant use. BEVs can now be back on the road quickly, often within the time needed for a rest stop or lunch break.

Simplified payments options at public charging stations

Another common concern is the complexity of having to use different public charging networks.

However, the EU Regulation 2023/1804 stipulates that drivers should be able to charge their BEVs at any publicly accessible fast charging point (above 50 kW) simply by using a credit or debit card, without needing to enter a contract with the charge point operator (CPO). Essentially, this makes charging as easy as paying for fuel.

The same EU regulation requires pricing options to be **transparent** and **reasonable**, which provides clarity and peace of mind to drivers and fleet operators. To further limit costs, fleet managers might subscribe to energy cards, which usually offer preferential rates.

Investing in home and office charging infrastructure

Thankfully, you don't have to rely only on public charging stations. Charging points at employees' homes or at the office are becoming a strategic investment for many businesses and can help you make sure vehicles are always ready for the next task.

According to our research, 19% of surveyed organizations in the EU have chargers installed at company premises, with another 32% planning to install charging points within the next 12 months. For another 22%, companies subsidize the installation of home chargers. You might also set up reimbursement programs to compensate employees for charging vehicles at home.

MYTH 4: "EV BATTERIES DEGRADE TOO QUICKLY"

Fact: On average, BEVs resold by Arval still have 93% of their original battery capacity

EV batteries are designed to last for many years, meaning that you'll almost certainly never have to worry about decreasing performance or replacements.

Battery warranties

Currently, according to data from our database, some battery warranties extend up to 10 years/200,000 km, which shows manufacturers' confidence in their reliability. In practice, this ensures that vehicles remain functional during their entire lifespan.

Degradation rates

Our research indicates that modern EV batteries degrade at 1.7% per year on average, meaning that after 7 years, they'll still have over 85% of their State of Health (SOH). At 200,000 km, the average SOH remains close to 90%. This metric shows the longevity and reliability of modern batteries. Based on a State of Health study performed by Arval, based on Moba & Aviloo data (companies specializing in industrial diagnosis and certification of EV batteries), batteries of BEVs remarketed by Arval had an average SOH of 93% (source: Arval database).

But all battery technologies do not present the same degradation properties. Currently NMC (Nickel Manganese Cobalt) and LFP (Lithium Ferro Phosphate) are the most popular battery types in the market. While NMC batteries are favored for their higher energy density, allowing for longer driving ranges, many entry-level BEVs utilize LFP batteries due to their cost efficiency and longer life-cycle.

In other words, even after their first cycle of use, **many BEVs remain functional and continue to perform well**.

MYTH 5: "BEVs ARE BAD FOR THE ENVIRONMENT"

Fact: Over their entire lifecycle, BEVs emit 50% less carbon dioxide than ICE vehicles

Many believe that BEVs are just as harmful for the environment – or even more so – than ICE cars, especially when considering the extraction of raw materials and the manufacturing process.

While it is true that the production of EVs and their batteries has a higher environmental footprint than that of traditional vehicles, this is offset quickly once the vehicle is in use; the data shows that BEVs' emissions are generally lower over their lifespan.

Lifecycle CO_2 emissions of BEVs vs ICE vehicles

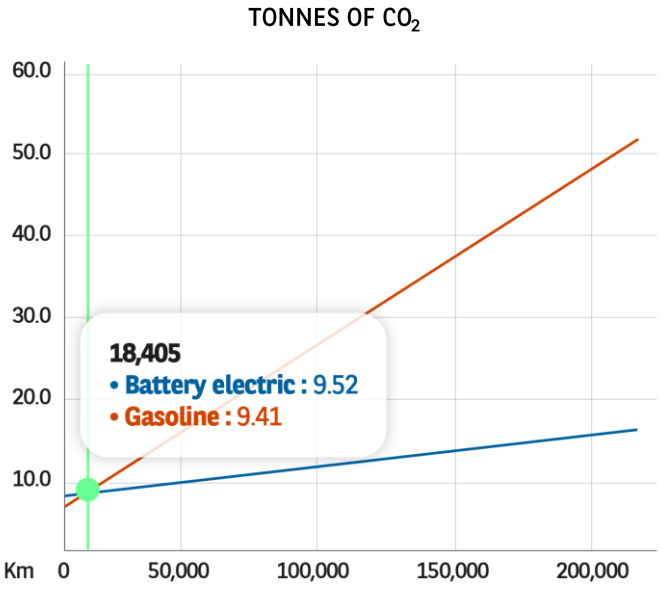
Over the entire lifecycle of a BEV, from production to disposal, it emits approximately half of the carbon dioxide of an ICE vehicle. (Source: IEA)

Over their lifespan, BEVs are responsible for approximately 19.7 to 21.1 tonnes of carbon dioxide emissions, compared to an average of 41.9 tonnes for petrol and diesel vehicles.

It's important to note that the energy mix plays a crucial role in determining BEVs' carbon footprint. Even in countries with a high-carbon energy mix, BEVs still produce fewer emissions over their lifespan than ICE vehicles. And, as renewable energy sources become more widespread in Europe, the emissions from the energy used to both fuel BEVs and produce batteries continues to decrease, further widening the gap between the carbon footprint of BEVs and ICE vehicles.

Offsetting carbon emissions from battery production

The carbon emissions from the production of an EV battery are offset by the vehicle's lower operational emissions (compared to ICE vehicles) around the 18,000 km mark, based on EU data for cars purchased in 2022. Beyond this point, the BEV's emissions are significantly lower.



In the EU, the point at which carbon emissions from battery production are offset by the lower energy needs of BEVs is around the 18,000 km mark.

Battery recycling considerations

Many companies today are investing heavily in battery recycling technologies to recover materials like lithium, cobalt, and nickel, which reduces extraction needs.

The European Union has introduced regulations requiring manufacturers to recover and recycle used batteries, with the following targets:

- Lithium: 50% by the end of 2027 and 80% by the end of 2031
- Copper, cobalt, lead, and nickel: 90% by the end of 2027 and 95% by the end of 2031

Additionally, before recycling, many EV batteries could be reused for less demanding applications, such as grid energy storage.

MYTH 6: "IT'S IMPOSSIBLE TO ELECTRIFY COMMERCIAL FLEETS"

Fact: Sales of new electric vans increased significantly, from 1.3% of all new vehicles in 2019 to 7.4% in 2023

Source: The Automobile Industry Pocket Guide 2024/2025, ACEA

With recent developments in battery technology, the wide availability of new electric vehicles on the market, and improvements in charging infrastructure, adopting electric light commercial vehicles (eLCVs) is not only possible, but increasingly practical.

Routes and usage patterns

Many LCVs operate within predictable daily routes of 200 to 300 km, which are well within the capabilities of modern eLCVs. By analyzing and understanding usage patterns, fleet managers can plan charging schedules, such as overnight charging at company parking lots or at employees' homes, making the transition easier.

BEVs and sustainability goals

Electrifying fleets is one of the most effective ways to meet Corporate Social Responsibility (CSR) goals and reduce greenhouse gas emissions. This shift also helps meet regulatory standards, especially with increasingly stricter emission regulations.

Strategic planning is a must

For a smooth transition, you need to carefully assess operational needs to determine the most suitable vehicles for each use case, be it BEVs, PHEVs, or, sometimes, ICE vehicles, and look into leasing contracts that will serve your goals. You also need to consider charging needs, look into total cost of ownership, and plan for a phased implementation starting with the easiest use cases.
Learn more about commercial fleet in the Arval Mobility Observatory white paper '10 questions on eLCVS'

CONCLUSION: WITH THE RIGHT STRATEGY, FLEETS CAN FULLY LEVERAGE THE BENEFITS OF BEVS

Every organization has its own operational constraints, vehicle usage patterns, sustainability goals, and financial considerations that you must carefully evaluate. And, for this, you need to look past the myths and explore your options based on facts and data.

Range autonomy and charging availability are top priorities for both drivers and fleet managers. Telematics can help identify the best vehicle for each driver, and onboarding sessions can help you address everyone's concerns.

For a successful transition, you need to investigate all available incentives, potential cost savings, and operational benefits, along with the environmental impact of adopting BEVs.

Arval Consulting can provide all the necessary support for your fleet's electrification, advising you on the best strategies to adopt and how to manage the entire transition process. Contact us to find out more.