



THE COMMERCIAL EV TRANSITION: GLOBAL INSIGHTS ON A MIXED-ENERGY FLEET FUTURE

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A Word From WEX

Electric vehicles are now a common sight on roads around the world. Across the globe, we are observing the varied stages of the transformative journey for commercial fleets of all sizes towards electrification, or mixed-energy fleets. This transition, however, won't happen overnight. Mixed-energy fleets are likely to be the norm in the energy transition for some time. Companies and governments will move at different paces, but all will face similar hurdles. A central challenge is balancing decarbonization goals with operational efficiency, along with the change management required to embed a new operating rhythm for electric vehicles (EVs).

A pivotal transition strategy acknowledges the growing value of mixed-energy fleets in ensuring a seamless and effective move to electrification. Mixed-energy fleets support organizations working to reduce emissions incrementally, meeting sustainability goals while ensuring a pragmatic solution. They provide the flexibility needed to adapt to evolving technological advancements and market conditions, while still reliably meeting customer needs and financial and operational goals.

With this dynamic landscape in mind, WEX commissioned Frost & Sullivan to conduct extensive research with mixed-energy fleet operators at over 500 organizations with commercial vehicles across Europe, the United States, and Asia Pacific about their journey toward electrification. This report offers insights into the pace of change across fleets, the influence of decarbonization, the technologies driving this shift, and analysis of key factors such as charging infrastructure, routing and logistics, payment platforms, and data utilization.

For me, it was hugely encouraging to see that 80% of fleet operators surveyed intend for at least 25% of their fleets to be comprised of electric vehicles (EVs) by 2030. It tells us that the transition is now upon us and emphasizes that, while timelines vary, many across our industry are navigating the same path – which is a powerful catalyst for industry-wide collaboration.

As you ramp up your own transition, I encourage you to pause and take stock of the learnings in this report. Transitioning to a mixed-energy fleet is more than just replacing vehicles – it's about a holistic assessment of your transition strategy and lifecycle. We hope you will find the insights within this report useful and practical as your organization advances the transition to a mixed-energy fleet.

— Carlos Carriedo, Chief Operating Officer, Americas Payments & Mobility, WEX



The Commercial EV Transition: Global Insights on a Mixed-Energy Fleet Future

In 2024, Frost & Sullivan interviewed over 500 organizations with mixed fleets (meaning they had both fossil-fuel and electric vehicles) about their journey toward the adoption of electric vehicles (EVs). The interviews were conducted with decision-makers across Europe (273 respondents¹), the US (110 respondents), and Australia/New Zealand (120 respondents). The research spanned topics including EV adoption and challenges, trends in charging infrastructure, payment systems, fleet management, and sustainability. This paper presents what the survey results indicate into what drives businesses and government entities to adopt EVs; how the journey to electrification is progressing; and how solutions such as decision-making tools, route planners, and advanced payment options influence, and potentially accelerate, the transition to EVs.

The transition to EV fleets has the potential to transform the commercial landscape, driven by significant cost-saving opportunities and technological advancements. Key insights from Frost & Sullivan's research reveal that businesses are lowering maintenance and operational costs while leveraging advanced tools and technologies to overcome integration challenges. However, adoption rates for EVs can vary significantly depending on factors such as the region, industry, and a business' scope and size. By exploring the motivations behind EV adoption, the progress in charging infrastructure, and the role of smart payment systems, this paper provides valuable insights for different types of businesses wishing to navigate and capitalize on the shift to electrification. Understanding these dynamics is essential for any organization aiming to optimize operations and achieve long-term financial benefits.



¹ France, 65 respondents; Germany, 60 respondents; Italy, 65 respondents; UK, 61 respondents; Benelux, 22 respondents.

Chapter 1:

Global Fleets Drive to Decarbonization

The movement towards sustainability and decarbonization comes as businesses with fleets of commercial vehicles face pressures from governments, customers, and value chain partners to improve their environmental footprint. Frost & Sullivan's research underscored these trends, with 70% of respondents noting that decarbonization was either an "important" or "cornerstone" component of their business strategy. The emphasis on decarbonization was strongest with businesses with larger fleets—from 14% to 23% of medium to very large fleets stated decarbonization was a cornerstone strategy, as opposed to 8% or fewer of small to very small fleets². Overall, however, nearly two-thirds (63%) of fleet managers specifically noted they had a low-carbon goal they needed to achieve by or before 2030.

Adopting EVs and investing in EV infrastructure are key strategies for businesses working toward decarbonization goals. The participants in the research identified battery electric vehicles (BEVs) as a technology of choice. Very large fleets (over 500 vehicles) were also investing in plug-in hybrid electric vehicles (PHEVs) at a high rate, which, when combined with existing internal combustion engine (ICE) vehicles, illustrates the emergence of mixed-energy fleets in the marketplace.




² Very small fleets, 2-4 vehicles; small fleets, 5-49 vehicles; medium fleets, 50-99 vehicles; large fleets, 100-499 vehicles; very large fleets, 500 vehicles or more.

The electrification of commercial vehicle fleets offers businesses significant benefits, from cost savings to environmental impact reduction, prompting many to switch their delivery vans, trucks, and other commercial vehicles to EVs. The top drivers in the survey for adopting EVs were to reduce carbon emissions, meet decarbonization goals, and realize cost savings (Figure 1), though the segment of very large fleets ranked cost savings and total cost of operation (TCO) as more important than carbon-related drivers.

FIGURE 1: Top 10 Drivers for Fleet Adoption of EVs Ranked

Rank	Driver
1	Reducing carbon emissions
2	Meet decarbonization goals
3	Cost savings
4	Advancements in battery technology
5	Brand image/reputational risk
6	Lower EV buying/operating costs compared to ICE
7	EV charging costs are lower than ICE fuel
8	Expansion of charging network
9	Competitive advantage
10	Government policies



Source: Frost & Sullivan

The heavily intertwined goals of reducing carbon footprint overall and meeting decarbonization goals were the leading reasons that businesses and government entities were adopting EVs. Many organizations have set ambitious environmental targets to control their carbon footprints. For example, in the US, Amazon has already installed 17,000 EV chargers as it embarks on a multi-year program integrating 100,000 Rivian electric vans, and major carrier FedEx plans to convert its entire pick-up and delivery fleet to EVs by 2040³. In Europe, businesses as diverse as IKEA and Deutsche Post DHL are pledging to electrify large swaths of their fleets.⁴ Fleet operators view these commitments as necessary to align with public sentiment towards sustainability and help ensure their businesses remain compliant with expanding government mandates.

³ <https://insideevs.com/news/716230/amazon-installed-over-17000-chargers-for-rivian-edvs/> and <https://newsroom.fedex.com/newsroom/global/brightdropev600>

⁴ <https://www.ikea.com/global/en/newsroom/sustainability/ikea-commits-to-zero-emission-on-heavy-duty-vehicles-220920/> and <https://www.smartenergydecisions.com/energy-management/2021/03/25/dhl-expands-electric-fleet-and-sets-new-carbon-targets>

EV Cost Dichotomy: Highly Ranked Driver, Challenge

Frost & Sullivan's research uncovered a dichotomy in the perceived financial implications of fleet electrification. On one side, the results highlighted the reduced operating costs of EVs as a major driver for adoption, and lower costs were the leading drivers for decarbonization overall. At the same time, respondents noted that the cost of purchasing EVs was problematic. While the research did not explicitly resolve this contrast, it may be that the up-front capital costs of purchasing EVs were concerning, while at the same time, respondents recognized EV's long-term operational savings over ICEs.

Over time, EVs can provide businesses with a significant financial advantage. Fewer moving parts can translate to lower maintenance expenses and longer lifespans that help offset higher EV purchase prices. Using electricity to power an EV is typically less expensive than powering an ICE vehicle with gas or diesel. Similar to fuel prices, electricity prices can also fluctuate. However, electricity rates typically adjust less frequently—and more predictably—than volatile fossil fuel prices, resulting in greater price stability and allowing for more accurate planning. These factors combine to deliver a compelling total cost of ownership (TCO) advantage for EVs over ICE vehicles.

However, the survey also revealed that the upfront financial impacts of purchasing EVs were the leading impediment to EV adoption. High upfront cost was the top challenge to adopting EVs as part of a fleet. A substantial upfront investment may



pose an obstacle that can be counterbalanced in the long-term by savings in charging, operating, and maintaining EVs.

Navigating this dichotomy necessitates a sophisticated approach from fleet operators. “To fully benefit from the high-value potential of electrification, it is crucial to make informed decisions based on energy demand predictions,” says Gideon van Dijk, founder and CEO of ChargeTrip, a range prediction and EV routing platform company. Van Dijk continues: “By understanding the energy demand profile of your existing fleets, you can optimize your future mixed-fleet configuration.” According to van Dijk, prioritizing routes for electrification, selecting appropriate vehicle types, determining battery capacity needs, scheduling overnight charging, and minimizing ad hoc charging costs are key considerations.

Utilizing EV fleet simulation tools can enable fleet operators to gain crucial business intelligence for scalable electrification that maximizes the returns on existing ICE assets while, over time, capitalizing on EV’s TCO benefits. ChargeTrip’s EV fleet simulation tool has demonstrated that with operational adjustments, 72% of routes could be immediately electrified without en-route charging. Even without any adjustments, 55% of routes could be electrified. The transition to electric vehicles also led to a significant reduction in operational expenditure of up to 15%.⁵

⁵ <https://www2.deloitte.com/nl/nl/pages/consumer/articles/scaling-the-transition-towards-zero-emission-fleets.html>



EV Fleet Integration

Along with balancing investment considerations, effectively deploying mixed-energy fleets presents fleet operators with operational hurdles (Figure 2). Route planning and optimization topped the list of fleet integration challenges due to differing fuel stations and charging locations.


Transitioning to alternative energy sources is fundamentally different from managing ICE fleets and introduces a higher level of operational complexity, “ranging from maintaining and retrofitting depots to managing logistics like planning and dispatching,” according to van Dijk. “Running an electric fleet is fundamentally different from its diesel and petrol predecessors. You need charging infrastructure, accurate energy demand predictions, optimized routes, and en-route charging support. Companies like ChargeTrip offer operational intelligence to electric fleets worldwide, providing an API with intelligent EV-based routing for all EV makes and models, a global database of charging stations, detailed emissions reporting, and other features.”

“The planning complexity for fleet managers increases substantially when you add EVs to your fleet: it’s not just optimizing vehicle utilization anymore, but also optimizing charger utilization,” says Sarah Booth, director of strategic business operations at Sawatch Labs, a WEX company, which provides fleet electrification analysis. Battery state of charge, battery pre-conditioning schedules and charging rate data can all introduce new data streams to fleets that go beyond traditional ICE norms. As such, data consolidation and analysis across vehicle types were also deemed to be difficult and limited a business’ holistic fleet oversight. Without unified analytics, EVs’ distinct operational profiles can obscure data-driven decision-making and hinder the optimization of routes and en-route charging support.

Integrating new EV vendors and software alongside existing ICE systems creates administrative challenges for fleet operators. As electrification grows, solutions consolidating vendor management and unifying operations across all vehicle powertrains will be essential to overcoming these integration challenges.

FIGURE 2: Top 10 Drivers for Fleet Adoption of EVs Ranked

Rank	Challenge
1	Route planning and optimization due to different ICE fueling vs. EV charging locations
2	Collecting and analyzing data across the fleet
3	Managing different vendors for ICE and EV
4	Integrating fleet management software



EVs and the Path Forward

As electrification accelerates, overcoming operational complexities will be of primary concern for running a competitive business. Frost & Sullivan's research shows that many companies and government organizations with a fleet of vehicles believe they are at the point in which EV adoption is becoming very compelling. In the survey, 42% of respondents estimated that half or more of their fleet would be composed of EVs by 2030. At the high end, one in five fleets in France is expected to be 100% EV by 2030. In the US and Germany, which had the lowest current penetration of EVs in their fleets, 64% or more of businesses expected to have at least 25% EVs by 2030⁶.

Despite upfront costs and infrastructure concerns, new and evolving financing solutions are facilitating the transition to mixed-energy fleets. Companies serving fleet operators are responding with options that address current challenges, empowering operators to continue to capitalize on EV opportunities. For example, purpose-built fleet card solutions that consolidate charging and utility payments can help alleviate administrative burdens. Combined with tailored software that unifies data and optimizes fleet deployment, these solutions help address EV integration challenges and pave a path toward a better financial and environmental picture.



⁶ Sixty-four percent of German fleets and 74% of US fleets stated they planned to have between 25% and 100% EV penetration by 2030.

Chapter 2:

Mixed-Energy Fleets Optimize Operations and Electrification

Transitioning from ICE vehicles to a mixed-energy fleet of ICE, hybrid, and EVs is in the planning stages—if not already underway—for many fleets, according to Frost & Sullivan research. Determining the optimal timeline and approach requires weighing capital expenditure planning, charging capabilities, new route optimization, and employee training. Still, most fleets remain undeterred: 80% of the organizations indicated that at least a quarter of their fleets will be comprised of EVs by 2030.

Pacing the mixed fleet transition

Growing the proportion of EVs in a fleet can introduce a complex interplay of financial considerations, operational intricacies, and strategic planning. One of the most critical aspects of navigating the EV transition is determining the right cadence of mixing EVs into the ICE pool.

Transitioning to an all-EV fleet will take time, resources, and infrastructure-building. Operating a mixed-energy fleet of ICE vehicles and EVs may be the norm for many businesses and government fleets for the foreseeable future.



In the research, potential impediments expressed by fleet managers were that they expect to face upfront vehicle and charging station costs and charging infrastructure installation challenges. Integration planning would be required for longer downtimes for charging and mitigating the lack of public charging infrastructure for longer delivery routes. Fleet operators will need to balance factors such as the residual value of the existing fleet, how to integrate EV charging into existing payment methodology and tracking, and new logistical and routing demands that surface when managing a mixed-energy fleet.

New Investment vs. Residual Value

As purchase and operational costs were the two leading concerns for EV integration, businesses with a commercial fleet must consider the residual value and usable lifespan of existing ICE vehicles to maximize returns on the capital already spent. Commercial vehicles represent major investments designed for years of service. Extending operations to get the most out of these assets may dissuade fleet operators from retiring ICE vehicles quickly. While EV operation and maintenance savings can mitigate a higher capital expenditure, the upfront cost means many businesses and government fleet managers must take a gradual, measured transition approach across multiple budget cycles rather than invest in wholesale fleet replacement.

Calculating if and how to ensure EVs provide a lower TCO than ICE vehicles can help accelerate the transition, especially if the existing fleet is aging and facing upcoming—and costly—maintenance. While pricing will vary, the cost of charging an EV is often less than the equivalent fuel costs to drive the same distance. Energy prices may fluctuate, but electricity costs are generally more stable than the price volatility typical of traditional fuels. Utilizing onsite renewable energy generation, such as solar power at charging stations, can further minimize exposure to utility rate volatility for EV fleets.

By projecting energy requirements based on routes and operations, businesses can calculate the ideal array of EV models, plan out their charging infrastructure, and

Advanced business intelligence tools can help organizations mitigate risk through informed electrification decisions. “Prior to procuring EVs or charging infrastructure, the right planning must be done to ensure smooth financial and operational integration and scaling,” says ChargeTrip’s van Dijk. “This can be done best by first understanding charge demand—how much energy is required, where and when—to operate, then procuring charge supply (battery capacity and charge infrastructure) to match.”

procure the appropriate battery capacity. Leveraging such tools allows a financially prudent, stepwise transition to a mixed-energy fleet while ensuring operational readiness as electrification scales up over time.

Business intelligence technologies like simulation are critical to enabling data-driven investment decisions for electrification. Prior to procuring EVs or charging infrastructure, the right planning must be done to ensure smooth financial and operational integration and scaling.

Charging requires planning but brings benefits

Survey respondents raised concerns about long downtimes during recharging and the lack of robust charging infrastructure. To help address these concerns, a notable 78% of respondents stated their organizations had onsite charging, and 69% said they valued the convenience and control of owning charging hubs. However, the high cost of installation was the leading challenge with owning hubs, noted by just over half (51%) of respondents.

Businesses often employ more than one charging system, with 62% of organizations also using public charging and 23% with drivers charging at home. As many respondents utilize various charging options, flexibility will be key for optimizing operations, minimizing downtime, and gaining insight into costs and billing.



The development of new solutions, such as centralized payment systems, helps fleets manage multiple scenarios. Advanced payment systems help streamline billing across charging networks and utilities, synchronize fuel payments and electric charging, and give drivers a single, simple option for reimbursement whether they charge at home or on the road.

By taking a holistic view of charging demands and opportunities, businesses gain full control over EV charging management. Rather than an impediment, charging becomes an optimized facet of electrified operations with the real potential to reduce fleet operating costs.

New routing and logistical considerations

Once fleets start integrating EVs alongside their ICE counterparts, a range of new logistical challenges emerge in maximizing the performance and efficiency of a mixed-energy fleet. Difficulty planning and optimizing routes was the leading challenge businesses expressed about EV integration.

While ICE vehicles offer straightforward route planning based on tank range and extensive fueling networks, EVs require more strategic deployments, as effective route planning depends on multiple factors. “This means using routing algorithms that effectively factor in properties like weather, road surface, elevation, speed, and others that inform energy consumption,” says van Dijk. Factors can also include battery capacity, driving efficiency, vehicle payloads, and availability of charging stations when it comes to determining the most efficient use cases for electric models.

Having a deep understanding of the business’ needs is an important reference point for assessing EV replacement of ICEs, which may not yet be applicable to all circumstances. Gaining a thorough understanding of operational needs increases the likelihood of successful EV integration where suitable.

Trip assignments must be carefully coordinated across diverse vehicle types with vastly different operating constraints. Precise routing accounting for these variables can help maintain consistent operations and optimize efficiencies, such as targeting the optimal time to charge a vehicle based on battery status and selecting the most cost-effective time and place to charge.

Without careful planning and execution, the differing routing needs of electric versus ICE models can undercut overall fleet productivity. Some advanced payment solutions now provide tools and insights that support route planning, helping turn a potential challenge into a competitive advantage over fleets using more manual planning systems.

Navigating complex energy sourcing and payments

Beyond route and charging infrastructure optimization, fleet electrification requires developing new strategies around energy procurement, billing, and payments, as compared to simply fueling at the pump. Innovators such as ev.energy are specializing in EV charge optimization, offering solutions to reduce charging costs and incorporate more sustainable and efficient processes. “ev.energy uses live and forecasted cost, carbon, and grid constraint signals to make charging cheaper, greener, and simpler,” says Nick Woolley, founder and CEO of ev.energy. Along with helping fleet managers reduce charging costs, “ev.energy helps electricity grid operators manage the increased EV load and align charging with greener generation,” says Woolley.

Businesses may face challenges with electricity rate structures varying by region and utility, requiring optimization across time-of-use billing, real-time pricing, and demand-based surcharges. “Fleet managers are now being asked to learn a slew of new metrics and to figure out how to align them with their standard operational data,” says Booth of Sawatch Labs. “One example is how EV charging impacts a monthly utility bill in addition to volumetric pricing (\$/kWh), which can vary seasonally or by the hour. Fleet managers have to determine how charging will impact their monthly demand charge, something that can be a substantial portion of a monthly utility bill for a commercial entity. This is vastly different from what fleets are used to with liquid fuels,” concludes Booth.



Operating across service areas compounds this with multiple electricity accounts and payment workflows. EV charge optimization solutions can consolidate billing and payments for fleets. Fleet management solutions providers offer such optimization and consolidated payment processes to meet the needs of mixed-energy fleets, reducing costs while assisting grid operators with increased EV load and aligning charging to greener generation.

Smart payment systems streamline fleet transitions

Tackling the various financial, technical, and behavioral changes required to transition fleets from ICE to mixed-energy fleets of ICE, hybrid, and EV can seem daunting. However, new solutions are helping fleets and drivers pay for mobility expenses like fuel, charging, and vehicle maintenance all within one system.

For example, specialized fleet payment solutions such as fleet cards can provide a centralized platform for funding and tracking both ICE fuel purchases and EV charging. These cards authorize fuel transactions and consolidate costs into centralized billing and reporting systems. Key benefits include an improved driver experience, moving them (and their fleet managers) away from managing receipts and expense reports. Providing managers with data-driven visibility into overall fuel and charging expenditures is another significant benefit. For businesses and government entities with commercial vehicles, consolidated payment solutions provide vital capabilities:



Streamlined authentication and access control: Fleet cards encoded with unique identifiers let drivers efficiently authorize and activate EV charging sessions via RFID or mobile apps across fragmented charging networks, both public and private facilities, providing a seamless charging experience anywhere vehicles operate.



Detailed transaction data: Real-time tracking of all charging sessions delivers robust analytics around energy consumption metrics. This aids in proactive renewable energy procurement, optimized vehicle deployments based on range needs, and right-sized site charging infrastructure over time.



Consolidated utility billing: Processing numerous charging-related utility bills across complex rate structures consumes considerable back-office resources. Intelligent payment platforms streamline all procurement into integrated invoicing.



Intelligent payment platforms streamline all procurement into a single system for invoicing, auditing, and accounts payable workflows, reducing administrative overhead.

For drivers, adopting smart fleet payment tools for fueling and charging brings key advantages as well. Embedded payment credentials in fleet cards or mobile apps provide a simple, consistent way for operators to initiate and pay for fuel and charging without juggling multiple accounts, subscriptions, or payment methods across different networks. Fleet cards also aid in accurate expense tracking and submissions. Payment data is automatically captured for every fill-up and charging session, removing the headache of manually recording receipts or other documentation. This seamlessly integrates fueling and charging costs into overall fleet expense management.

The multi-year journey to fleet electrification invariably means operating a mixed inventory of both ICE and EV assets. This transition period introduces major complexities around capital planning, vehicle operations, infrastructure, energy sourcing, and payments. Ongoing evaluation and analysis are crucial to determine the cadence and specifics of converting to EVs.

Payment innovations customized for EV operations can help streamline many financial and logistical hurdles. Smart, connected fleet payment ecosystems accelerate



electrification by seamlessly funding universal charging access, delivering vital operational analytics, automating complex utility billing workflows, and empowering drivers. As businesses work to achieve emissions reductions, intelligent payment tools will be essential for efficiently managing mobility expenses across their diverse vehicle pools.

The findings from Frost & Sullivan's research highlight the multifaceted journey towards fleet electrification, emphasizing the critical role of advanced planning, strategic investment, and innovative payment solutions in overcoming adoption challenges. As businesses transition to a mix of ICE, hybrid, and EVs, the integration of smart payment systems and comprehensive fleet management tools is pivotal. These solutions streamline financial and operational processes as well as enhance data-driven decision-making, ensuring a smoother transition to when and how—and even if—a business undertakes electrification. Organizations at various stages should consider these insights to optimize fleet operations, reduce costs, and align with sustainability goals, positioning themselves competitively for the future of transportation.

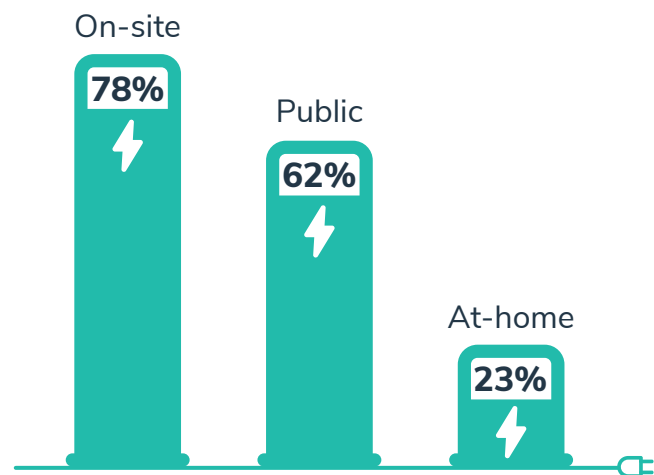


Chapter 3: Charging Ahead With Advanced Payment Solutions

Charging infrastructure buildout and payment systems are deeply interdependent in the fleet electrification process. Choices around deploying depot (onsite) chargers versus relying on public networks can shape EV acquisition strategies. Frost & Sullivan's research found that a substantial proportion (78%) of organizations have charging onsite, though charging en-route and at home were also used (Figure 3).

Any time an organization makes a significant investment in new equipment, costs will be an important consideration, and EVs are no different. While electric charging is considered less expensive and more stable than fueling with petroleum products, it is still a considerable proportion of a government's or business's operational expenses when managing a fleet of commercial vehicles.

FIGURE 3: Where Fleets Charge



Note, figure equals more than 100% due to organizations using multiple charging options.



The two most common ways fleets said they controlled charging costs were leveraging low-rate periods (the leading method was to charge EVs during off-peak hours, such as overnight) and charging separate energy storage batteries during off-peak times (which could then be used to charge EVs at any time without incurring peak costs).

The third most cited cost reduction tactic was implementing monitoring and analytics tools tracking energy consumption. Visibility into usage patterns and energy workflows enabled fleet operators to identify inefficiencies and optimization opportunities. With granular insights into when, where, and how electricity is being consumed across their mixed-energy fleet and facilities, operators can pinpoint areas of waste and take corrective measures. Continuous monitoring and advanced analytics also provide insights for continual improvement and cost reduction over time.

Other cost-reduction methods included generating renewable power onsite, such as with solar panels, and implementing energy efficiency measures across the charging infrastructure.

Conquering charging challenges

The cost and availability of charging options impact how quickly businesses can transition to EVs. The research confirmed that onsite charging depots and associated energy management systems can carry significant upfront capital expenditure, but also provide users with better control over energy use and, thus, operating expenses. This is especially true when incorporating onsite renewable power sources. Company charging stations can also be configured to capture and deliver critical operational data to further optimize running costs.

To allow flexibility in fleet charging locations, especially as a business grows, many companies will use a combination of onsite, public, and at-home charging. Access to a wide network of charging stations across multiple locations was reported by 77% of respondents as the leading benefit. The use of shared public charging stations and home charging also shifts CapEx to OpEx. Cost savings and convenience were the most cited benefits for home charging, cited by 67% and 66% of respondents, respectively.

However, these options are not without challenges. Accessing public chargers can impact driver time-on-job compared to the efficiency and convenience of in-house stations.

“Long wait times” was the main pain point ascribed to en-route charging. Moreover, public networks may not seamlessly integrate with fleet management platforms, impeding real-time visibility and control for effective fleet management.

While at-home charging presented cost-saving opportunities, the most common barrier cited was the difficulty in accurately reimbursing drivers for charging expenses. Manual tracking may be prone to inaccuracies, can be laborious for the driver, and can be an administrative burden for the business. Integrated payment systems that seamlessly connect with fleet management platforms can help streamline and automate this process. By implementing advanced payment and charging solutions that can integrate onsite, en-route, and home charging, fleets can reimburse drivers for charging costs more accurately and with less effort for both the driver and the business.

Technologies that enable EV transition, business growth

In adopting a mixed-energy or predominately EV fleet, a business must consider its growth trajectory. Can the business afford onsite charging stations and keep pace with the growth of operations and fleet size? Will public infrastructure expand quickly enough to reduce wait times across all necessary geographies? Can home charging provide convenience without administrative burden?

Businesses and governments need solutions that can transcend these challenges, providing fleet managers with a comprehensive view of operations and billing that encompass ICE vehicles and EVs and that facilitate the right charging options for each situation a driver may face. Payment decisions involve upfront costs, driver convenience, flexibility and vehicle location at the time of charge. Frictionless payment is crucial to optimize charging utilization and keep drivers and administrators productive. Ideally, such solutions can provide quick wins for fast ROI as well as future-proofing innovations that can evolve with the business' needs.



Payment Platform Options

Businesses with commercial vehicles are familiar with the benefits of fuel cards and related solutions that streamline charging options, driver expense reimbursement, and keeping costs down through bulk purchases: a full 90% of survey respondents use the same payment options for their EVs and ICE vehicles.

While the number of public EV charging locations is expanding rapidly, charging infrastructure struggles to match the convenience and ubiquity of ICE fueling stations and payment options. Governments and private organizations are helping expand public charging infrastructure, but this can lead to a patchwork of charging system owners and operators and payment methods. Diverse power grid models worldwide add complexity, especially for businesses with fleets across multiple geographies. Governance and ownership structures impact electricity availability, directly affecting fleet charging feasibility. State-controlled or privatized grids, utilizing centralized or decentralized models, can all shape the charging ecosystem and create unwanted complexity without external support.

Efficiently charging vehicles under tight delivery schedules can be challenging due to the current charging landscape and intricate power grid structures. Streamlined payment systems are crucial to navigating the array of platforms and standards, preventing unnecessary friction. Continuous monitoring of ongoing EV charging infrastructure developments and power grid models is essential, as the information provided is continuously evolving. Given these charging considerations, streamlined payment and billing systems will help businesses avoid disruption. A multitude of platforms and standards industry-wide make this difficult.

Centralized Solutions

Carrying multiple access cards or RFIDs—or juggling apps and fuel cards—adds undue complexity to a driver's and a fleet manager's workday. On average, 41% of businesses use multiple brands of charge cards across their mixed-energy fleets. The proportion of multi-vendor users increases to 61% for “very large” fleets (those with 500 or more vehicles). The main benefits of using multiple brands' cards were cost savings and the need to access diverse charging and fueling networks. Cost savings, however, was also

Corporate fuel cards were the most common, reported by 65% of survey respondents, though company credit cards were also used by 40% of businesses. Apps, such as mobile wallets or charging network apps, were also employed by a quarter of the respondents.

a reason 59% of fleets use a single vendor, second only to the benefit of consolidated expense tracking. Regardless of whether a company used a single or multiple vendor system, the ability to use a card “anywhere” and specifically across fueling and charging stations were the main factors in determining which card(s) to use.

Advanced payments allow one card or app to access nearly any public station for mixed-energy fleets, but they can do more as well: these solutions streamline charging expenses, offer easy reimbursements for home charging, and provide insights for efficient energy management. Fleet managers gain visibility into charging patterns and cost optimization opportunities, helping minimize expenses and maximize returns on electrification investments.

Behind the scenes, payments are routed to the appropriate charging network, but to the driver, charging requires just a single card swipe regardless of the station operator. For administrators, all charging events are aggregated for transparent per-vehicle and total energy cost reporting. In essence, universal fleet charging platforms act as clearinghouses between the major charging networks.



For example, in Europe, ChargeTrip routes millions of vehicles monthly to selected charging stations. The result is that drivers will pay less on average for using a preferred operator, and the operator increases the utilization of their station significantly. This collaborative approach benefits the driver, charge point operator, fuel card provider, and the business owning and operating the commercial vehicles.

Future-proofing payments

Tailored payment systems facilitate the management of mixed-energy fleets and transition to EVs, ensuring billing processes are transparent and scalable. By removing the payment friction of multiple access methods, charging utilization is optimized for use across depot, home, and public sites. Robust payment platforms consolidate costs and reimbursements into a cohesive system, providing insights into energy usage patterns and optimization opportunities. A streamlined driver experience coupled with back-end analytics, empowered by smart payment systems, can give fleets a marketplace advantage. With a strategic approach to payment integration, fleets can elevate their electrification initiatives into a competitive advantage.



Chapter 4: Unlocking Seamless Fleet Sustainability With Smart Payments

As noted previously in this paper, purpose-built payment platforms are emerging to meet the unique needs of mixed-energy fleets. Smart payment systems aim to unify the driver's charging experience, provide back-end analytics on usage and costs, and facilitate the transition to EVs—all supporting ongoing business growth objectives.

Modern solution providers serving commercial fleets recognize that, while essential, businesses may need more than streamlined payment options to transition to electrified fleets successfully. Frost & Sullivan's research showed fleets are most interested in the flexibility of where and how they can use a payment solution (Figure 4). Through extensive sector expertise and broad partnership networks, solution providers are enabling this flexibility; and going beyond as well, building offerings and capabilities that address standard and evolving EV payment systems options. After flexibility and security, the next most important feature sought by fleets was compatibility with fleet management systems.

FIGURE 4: Top 10 Considerations for Payment Solutions Ranked

Rank	Driver
1	Use card for fueling/charging; use card anywhere (tied)
2	Security
3	Compatibility with fleet management systems
4	Fraud alerts
5	24/7 customer service
6	Real-time account management
7	Expense management tool integration
8	Mobile phone access
9	Attractive discounts and rewards
10	Tax exemption reports

Source: Frost & Sullivan



Smart payment systems and beyond

A combination of fiscal management with purpose-built capabilities optimized for EVs distinguishes smart fleet payment products from more basic options. Advanced solutions aim to remove payment friction while providing indispensable fleet electrification tools, such as the following:

- **Provide analytics.** Detailed data, reporting, and insightful dashboards help managers make smart decisions based on accurate charging, usage, and cost data.
- **Enable scalability.** Advanced payment systems can readily scale up in capabilities and geographic reach as fleet charging needs grow over time.
- **Facilitate driver convenience.** Universal payment methods avoid drivers juggling multiple access cards, RFIDs or apps to pay at all station types.
- **Embed robust cybersecurity.** Charging platforms handle sensitive payment data and interface with increasingly connected vehicles, all of which need stringent data security.
- **Cost streamlining.** Consolidated billing of all charging transactions simplifies accounting and provides visibility into total energy costs.
- **Demonstrate future-proofing.** Utilizing adaptable technology allows the integration of emerging innovations such as autonomous charging.
- **Inform EV transition strategies.** Leveraging expertise in the sector and strategic partnerships, the right payment solution provider can even aid in a smooth transition to EVs by advising on ideal vehicles and timing based on a business' existing fleet and their expansion goals for that fleet.

Businesses need to consider their priorities and growth objectives when considering payment platforms and solution partners. Will the business expand to new geographies, and can the platform operate internationally? Will the business begin to include public charging as it expands, or will it build out its own depots; and can the same payment solution migrate between the two? Can the platform foresee advances in technology, such as autonomous EVs that self-charge based on usage or schedule? If so, can the payment system securely authorize vehicles, and not just drivers, to authenticate and pay for charging?

Charging infrastructure and adaptable payment tools need to be tightly aligned to address an evolving fleet. Upgradable payment solutions that anticipate fleet needs can help avert future bottlenecks. Forward-thinking businesses should consider unified payment platforms that easily integrate with networks old and new. This avoids having to rip-and-replace systems down the road as EVs continue scaling up.

Next steps for smart fleet payments

Specialized payment platforms built for the unique demands of electrified fleets will help businesses move toward a more sustainable, mixed-energy fleet with more ease and less complexity. Steps that an organization can take to find, evaluate, and implement next-generation charging include the following:

- **Consider seeking an experienced partner organization** that can provide EV fleet planning and integration tailored to the business' unique needs. Enlisting a combination of purpose-built technology and expert guidance ensures fleets can smoothly transition across vehicle technologies, leverage best-in-class processes and systems, and address driver and fleet manager needs simultaneously.
- **Understand the benefits that purpose-built fleet payment solutions can provide.** Businesses should evaluate fleet card offerings and their capabilities relating to driver convenience, back-office analytics, bill consolidation, and route planning optimization.
- **Consider pilot deployments.** The right pilot program helps fleet operators learn the system, test its benefits or challenges, and right-size a scalable smart payment plan aligned with long-range transition milestones.
- **Recognize that it may not be advisable to simply “plug in” new EVs** and assume that existing systems will adapt. The right payments and fleet management platform optimizes both ICE and EV assets for a business's specific operational environment. Being proactive in selecting or upgrading to payment solutions that remove friction while providing actionable data is fundamental to easing into a mixed-energy fleet and recognizing quick ROI.

Businesses strategically leveraging smart payment systems gain significant control and visibility as fleet electrification accelerates. The integration of efficient charging, robust data, and advanced capabilities streamlines financial transactions, propelling businesses toward more easily managed, sustainable operations. With the ability to monitor and optimize sustainability and track TCO, comprehensive payment tools provide the intelligence, guidance, and future-proofing insights that businesses and government fleet managers need to prepare for a fast-approaching EV future. As the EV landscape continues to evolve, these smart payment solutions will play an increasingly crucial role in helping organizations navigate the complexities of mixed-energy fleets. By embracing these technologies, fleet operators can position themselves at the forefront of the transportation revolution, driving both operational efficiency and environmental responsibility.



About the survey

Frost & Sullivan interviewed 503 decision-makers at businesses with mixed EV and ICE fleets in 2024. The regional split for these interviews was as follows: France, 65 respondents; Germany, 60 respondents; Italy, 65 respondents; UK, 61 respondents; Benelux, 22 respondents; United States, 105 respondents; Australia, 60 respondents; New Zealand, 60. Fleet size definitions and corresponding respondents were: Very small fleets 2-4 vehicles, 101 respondents; small fleets 5-49 vehicles, 114 respondents; medium fleets 50-99 vehicles, 116 respondents; large fleets 100-499 vehicles, 115; very large fleets, 500 vehicles or more, 57 respondents.

Data referenced in this paper is based on the Frost & Sullivan survey unless otherwise stated and does not claim to represent the entire fleet user population. Percentages may not always total 100% due to rounding. The interpretations and conclusions drawn are those of the authors representing Frost & Sullivan and do not necessarily reflect the views of WEX, the respondents of the survey, or their organizations.

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