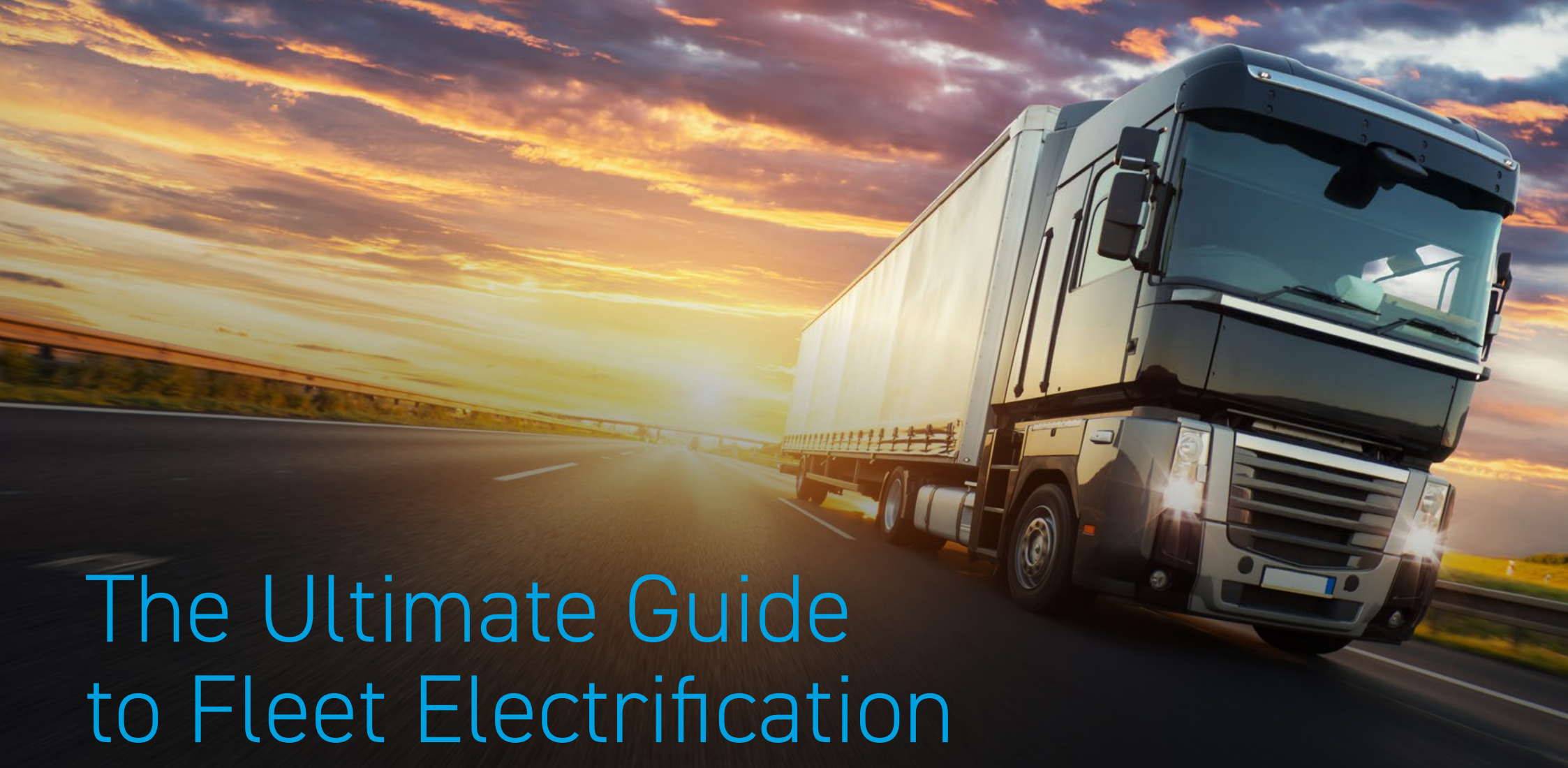


The Ultimate Guide to Fleet Electrification

What Fleet Managers Need to Know About Planning, Building, and Managing EV Fleet Charging Infrastructure

Electrada | Energizing Your Fleet

The shift from traditional internal combustion engine (ICE) vehicles to electric vehicles (EVs) is gaining speed and transforming the transportation sector. This transition is not limited to personal vehicles; it now extends to the realm of fleets, where electrification offers a multitude of benefits. Electrified commercial fleets bring long-term cost savings, reduce fleet environmental impact, and accelerate compliance with increasingly stringent federal and state regulations.

These benefits are no longer out of reach for most organizations. Electrification is now an option for all vehicle types, and it's particularly viable for those that form the backbone of many commercial fleets. As more organizations recognize the opportunity and advantages of EVs, fleet managers are tasked with navigating the complexities of this transition.

Fleet electrification requires a solid roadmap with a playbook that addresses the interdisciplinary nature of the challenges involved. Fleet managers and their organizations will encounter complex issues that extend beyond their daily experience, including navigating

Electrified commercial fleets bring long-term cost savings, reduce fleet environmental impact, and accelerate compliance with increasingly stringent federal and state regulations.

regulations, utility guidelines, and operational concerns. A well-crafted plan ensures project costs remain controlled, benefits are realized, and progress is steady.

This comprehensive guide will provide fleet managers with the knowledge and tools necessary to embark on a successful fleet electrification journey. From understanding the economic impetus behind the shift to EVs to navigating the intricacies of charging infrastructure, the following chapters will cover all the essential aspects of fleet electrification. We will also delve into the role of Charging-as-a-Service (CaaS) models, explore futureproofing strategies, and highlight a real-world case study that demonstrates the feasibility and benefits of electrifying fleets.

CHAPTER 1

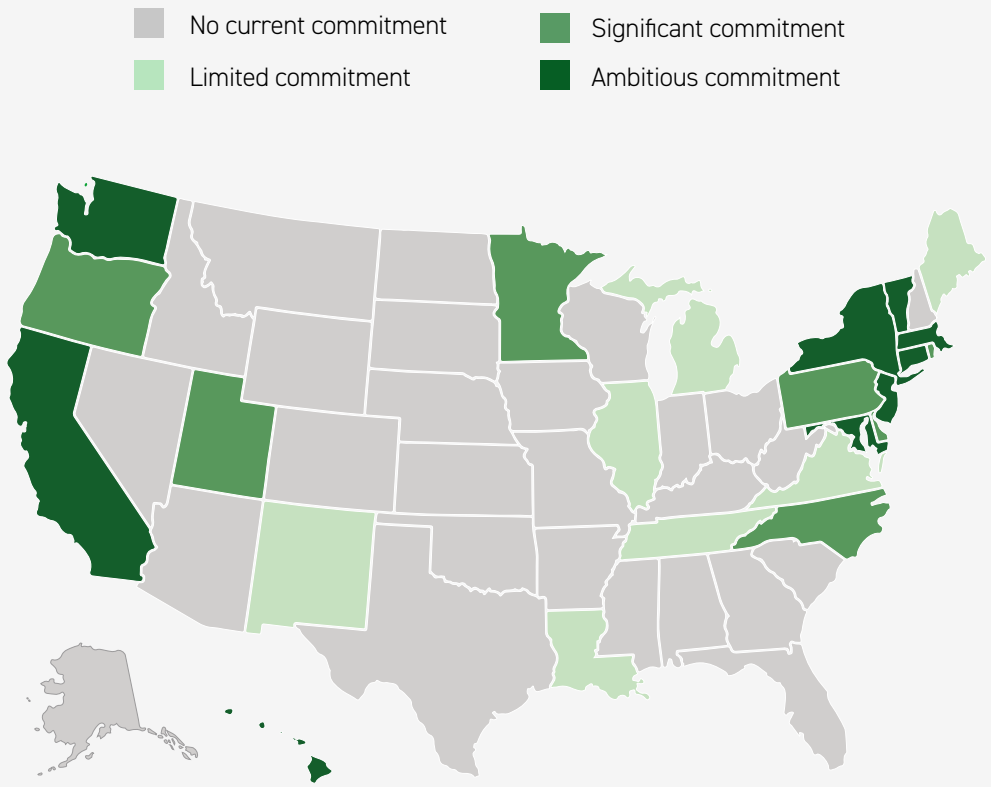
Understanding Fleet Electrification

Fleet electrification is a comprehensive journey that involves more than just replacing traditional ICE vehicles with EVs. It encompasses a strategic transformation of the entire fleet ecosystem, including infrastructure, operations, and business models. This journey can be executed in phases or all at once, depending on the specific needs and goals of the organization. Effective fleet electrification requires meticulous planning, stakeholder engagement, and adaptation to new technologies and regulations to ensure a successful and sustainable transition.

This process is already well underway in both the public and private sectors. In the U.S., the World Resources Institute reports that 15 states have made significant or ambitious commitments to electrifying public fleets, and a recent Accenture report reveals that 54% of commercial executives say EVs constitute up to a fourth of their fleet.[1][2]

Globally, sales of electric buses, trucks, and other medium- and heavy-duty vehicles continue to grow.[3] This progress is bolstered by the fact that vehicles in classes 3–6 — a significant portion of many fleets — are primed for electrification based on their typical route length.[4]

Public Fleet Electrification Commitments by U.S. States



Source: American Council for an Energy-Efficient Economy (ACEEE).

WORLD RESOURCES INSTITUTE

Despite these encouraging trends, shifting to an EV fleet requires careful planning and execution. Making an effective switch from the prevailing quick-stop refueling model to an efficient setup for day-to-day charging management is a complex undertaking with numerous critical considerations. Every project must address the two core components of upgrading vehicles and establishing charging infrastructure. Moreover, the choice of vehicles and their application within the fleet's operations are the largest single influencers of post-go-live success. Understanding how to select and use the right vehicles cannot be overemphasized, as it significantly impacts the overall effectiveness and efficiency of the fleet electrification process.

Ultimately, the outcome of any electrification project must be aligned with the sustainability objectives, use cases, energy requirements, business operations, and route distances of any given fleet on a per-site basis. Fleet managers and stakeholders can easily get off course without a comprehensive view of the pros, cons, and pitfalls — not to mention the essential steps — of large-scale electrification.

In this chapter, we'll explore the key advantages and disadvantages of going electric, setting these realities within the larger context of the current economic and regulatory environment. We'll also introduce the greatest hurdle many fleet operators face: planning, establishing, and managing charging infrastructure for their new EV fleet.

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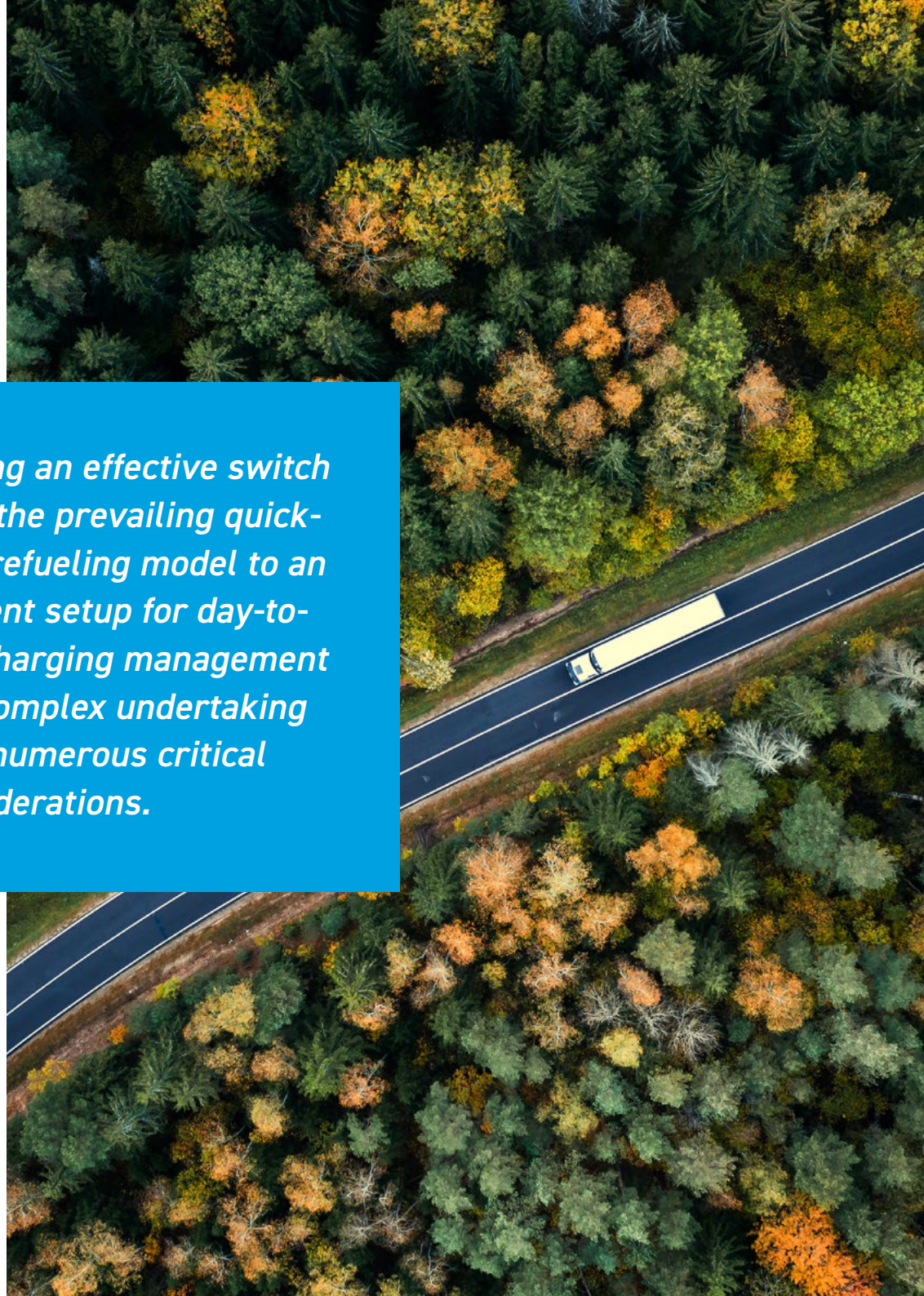


Benefits of Electrifying Fleets

There are numerous benefits to electrifying fleets, not all of which are obvious at first glance. Overall, these advantages fall within the following five buckets.

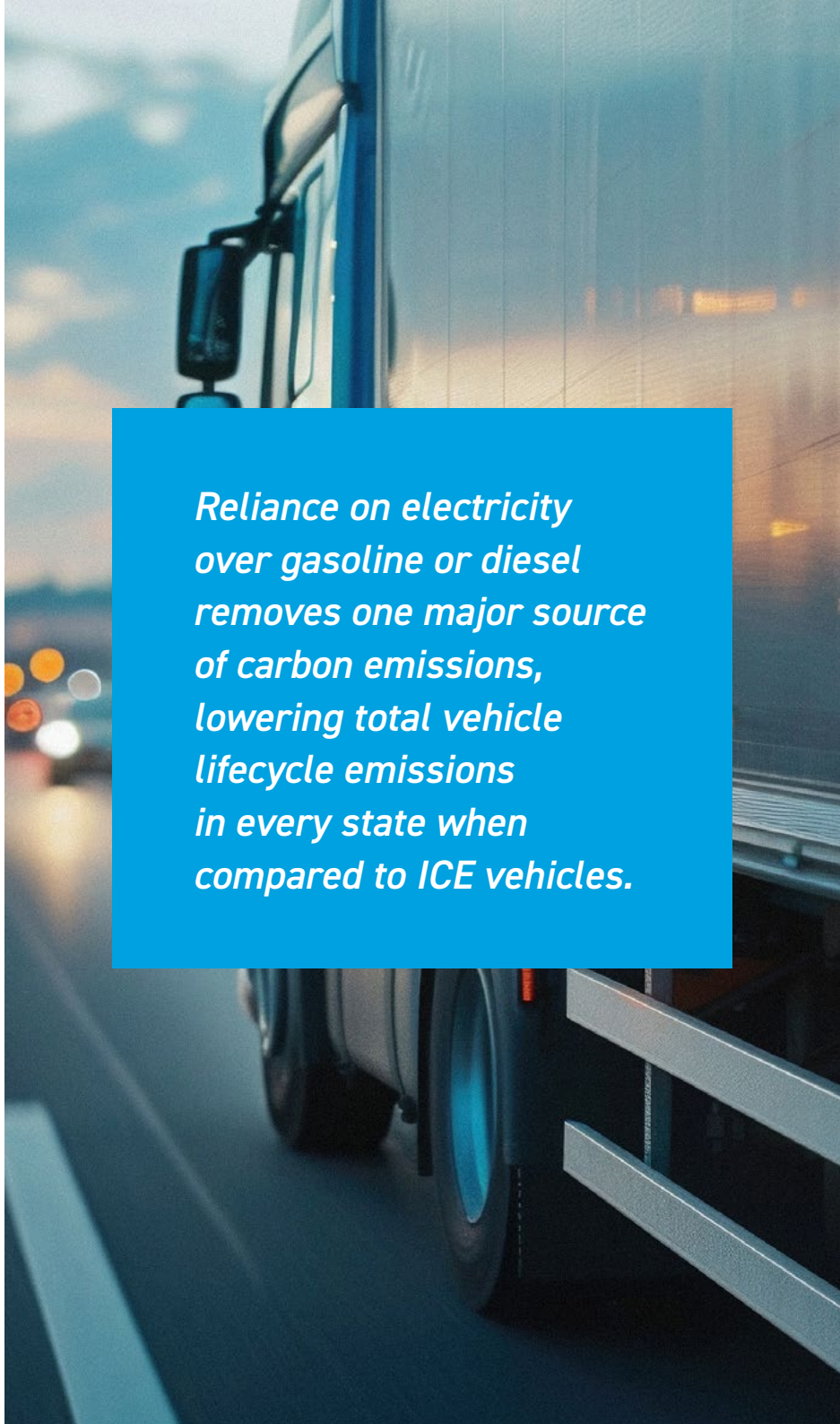
Regulatory Compliance

The federal government and many U.S. states are implementing regulations and mandates to encourage and guide the adoption of EVs. The most progressive states, such as California, are poised to transition to 100% zero-emission vehicle sales within the next decade.[5] Electrifying fleets allows organizations to stay ahead of these regulations and avoid potential penalties or fines.

Environmental Impact

EVs produce zero tailpipe emissions, improving air quality and reducing greenhouse gas emissions. These advantages are not equally realized in all markets — they're stronger in areas where electricity is generated from renewable sources. Nonetheless, reliance on electricity over gasoline or diesel removes one major source of carbon emissions, lowering total vehicle lifecycle emissions in every state when compared to ICE vehicles.[6]

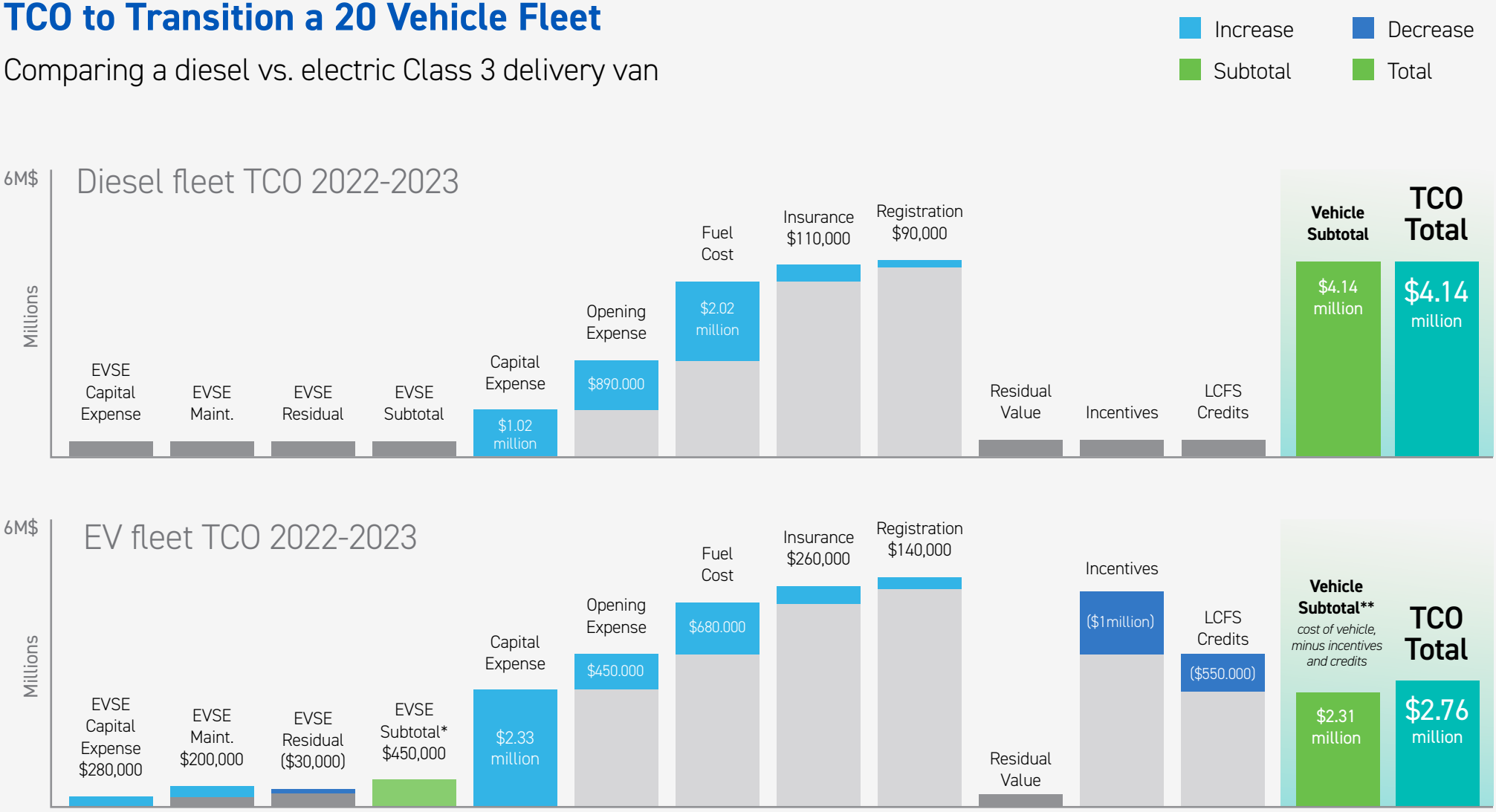
By electrifying fleets, organizations can significantly reduce Scope 1 and 2 emissions — those greenhouse gas emissions directly or indirectly attributed to company activities — and ramp up their participation in the fight against climate change. This enables them to push toward net-zero carbon emissions; better comply with corporate environmental, social, and governance (ESG) goals; and improve brand perception. Such initiatives also address rising health risks to vulnerable populations posed by vehicle air pollution.



Reliance on electricity over gasoline or diesel removes one major source of carbon emissions, lowering total vehicle lifecycle emissions in every state when compared to ICE vehicles.

TCO to Transition a 20 Vehicle Fleet

Comparing a diesel vs. electric Class 3 delivery van



* TCO calculation reflects the infrastructure incentives and

** Vehicle subtotal before energy savings available through PG&E's EV Fleet program incentives totals $3.86 million

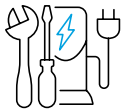
Cost Savings

EVs offer significant cost savings in the long run. While some commercial EVs may have higher upfront costs than their ICE counterparts, they offer lower operating and maintenance expenses. Because EVs have fewer than 200 moving parts — compared to over 2,500 in ICE engines — EV maintenance costs average around 50% lower than those of liquid-fuel-powered vehicles. Additionally, government incentives, such as purchase subsidies, tax exemptions, and reduced registration fees, further offset the initial investment, making EVs a more economical choice over time.

In many markets, these factors add up to a lower total cost of ownership (TCO) over the vehicle's lifetime.[7] A recent study by the Environmental Defense Fund analyzed the TCO for various vehicle types and found that EVs offer significant savings compared to their liquid fuel-powered alternatives. The study considered factors such as government incentives, lower maintenance costs, and reduced fuel expenses, all of which trim the TCO for EVs.[8]

Improved Driver Experience and Safety

The benefits of reduced pollution extend to fleet drivers, who stand to enjoy a healthier, quieter, and smoother driving experience. Additionally, many EV fleets come equipped with onboard telematics that managers can use to monitor speed and driving habits and increase employee safety and productivity. In a market fraught with driver shortages, EV fleets can become a powerful marketing tool for attracting and retaining the next generation of employees.

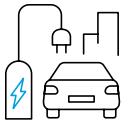


Operational Enhancements

Electrification also offers advantages at the operational level. With a fully electric fleet, managers can remove flammable fuels from their depots, reducing the risk of fire on site. In some cases, this may even allow fleets to drop expensive insurance coverage and tighten up operating costs.

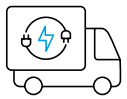
Challenges of Fleet Electrification

While the benefits of fleet electrification are compelling, organizations must also be aware of the challenges associated with this transition. The move to electrify comes with substantial infrastructural and operational obstacles.



Building and Managing Charging Infrastructure

Implementing an optimized charging infrastructure is crucial for the successful operation of an EV fleet. This requires careful planning, investment, and coordination with utilities and charging equipment providers. Without proper consideration, charging equipment and power supply may be inadequate for long-term scalability. Much of this guide will be dedicated to helping fleet operators overcome this significant hurdle.



Selecting the Right Fleet Vehicles

Choosing the right EVs for a fleet requires considering factors such as range, payload capacity, and charging requirements. Fleet managers must assess their operational needs and select vehicles that align with their specific use cases. These decisions go hand in hand with planning for sufficient charging infrastructure.

Operational Changes and Expenses

Transitioning to an EV fleet may necessitate changes in operational processes, such as route planning, charging schedules, and driver onboarding and training. Fleet managers must be prepared to adapt their operations to accommodate the unique characteristics of EVs. Having a well-trained, specialized workforce that's prepared to manage EV fleets effectively is also essential to ensure optimal performance and maximize the benefits of electrification.

Of course, one of the key roadblocks to fleet electrification is the upfront cost of EVs and charging infrastructure. However, with proper planning, the long-term cost savings and environmental benefits make the investment worthwhile. State and local governments, alone, stand to save as much as $11 billion by going electric with their fleets.[9]

One of the key roadblocks to fleet electrification is the upfront cost of EVs and charging infrastructure.

Charging Infrastructure: Paving the Way for Electrification

A robust and reliable electric fuel solution is the backbone of a successful EV fleet. Inadequate charging facilities can compromise the operational efficiency and range of fleet EVs. Therefore, fleet managers must ensure the selected technology is vetted, interoperable with the chosen vehicles, and designed for high uptime and reliability. This technology should be fully integrated with other ecosystem components, emphasizing that an electric fuel solution is a holistic approach rather than just an off-the-shelf charger with a plug. Understanding available EV charging technology, the importance of smart-grid integration, and futureproofing strategies is crucial for maintaining a reliable and efficient fleet.

According to the Pew Research Center, the number of available charging stations in the U.S. has more than doubled since 2020.[10] However, much of this infrastructure consists of public-access charging points, which are a poor fit for most fleet charging needs.

Yet, adding more private fleet charging infrastructure to this mix presents significant challenges to the nation's existing energy grid. According to

the American Transportation Research Institute, some states would need to boost electricity production by as much as 50% to meet full fleet charging demands under current conditions.[11] These obstacles highlight the importance of integrating charging infrastructure with smart-grid technologies to optimize energy usage and reduce strain on the grid during peak demand periods.

For instance, Green.org discusses the evolution of EV charging technology, ranging from advancements in fast charging to wireless charging.[12] These developments not only enhance the convenience and efficiency of EV charging but also enable new opportunities for energy management and grid stabilization.

Finally, when planning the charging infrastructure for an EV fleet, it is essential to consider futureproofing strategies. As the fleet grows and technology evolves, the charging infrastructure must be scalable and adaptable to changing requirements. This may involve installing additional charging points, upgrading electrical capacity, and implementing smart charging management systems. Planning for this growth is best done at the beginning of the electrification process, so appropriate electrical capacity and layout can be built in from the start to avoid delays and unnecessary utility cost sharing.

Futureproofing charging infrastructure ensures an organization is well positioned to handle the increasing demand for EV charging as its fleet expands. It also allows for the seamless integration of new technologies and charging standards as they emerge, minimizing the need for costly retrofits or replacements. Finally, successful futureproofing will also provide pivoting options if speed bumps arise in municipal and/or utility approvals and processes.

As the fleet grows and technology evolves, the charging infrastructure must be scalable and adaptable to changing requirements.

An effective planning process in this area lays the foundation for a successful transition to an all-electric fleet. In the chapters ahead, we'll explore many of these critical aspects of planning EV fleet charging infrastructure in greater depth.

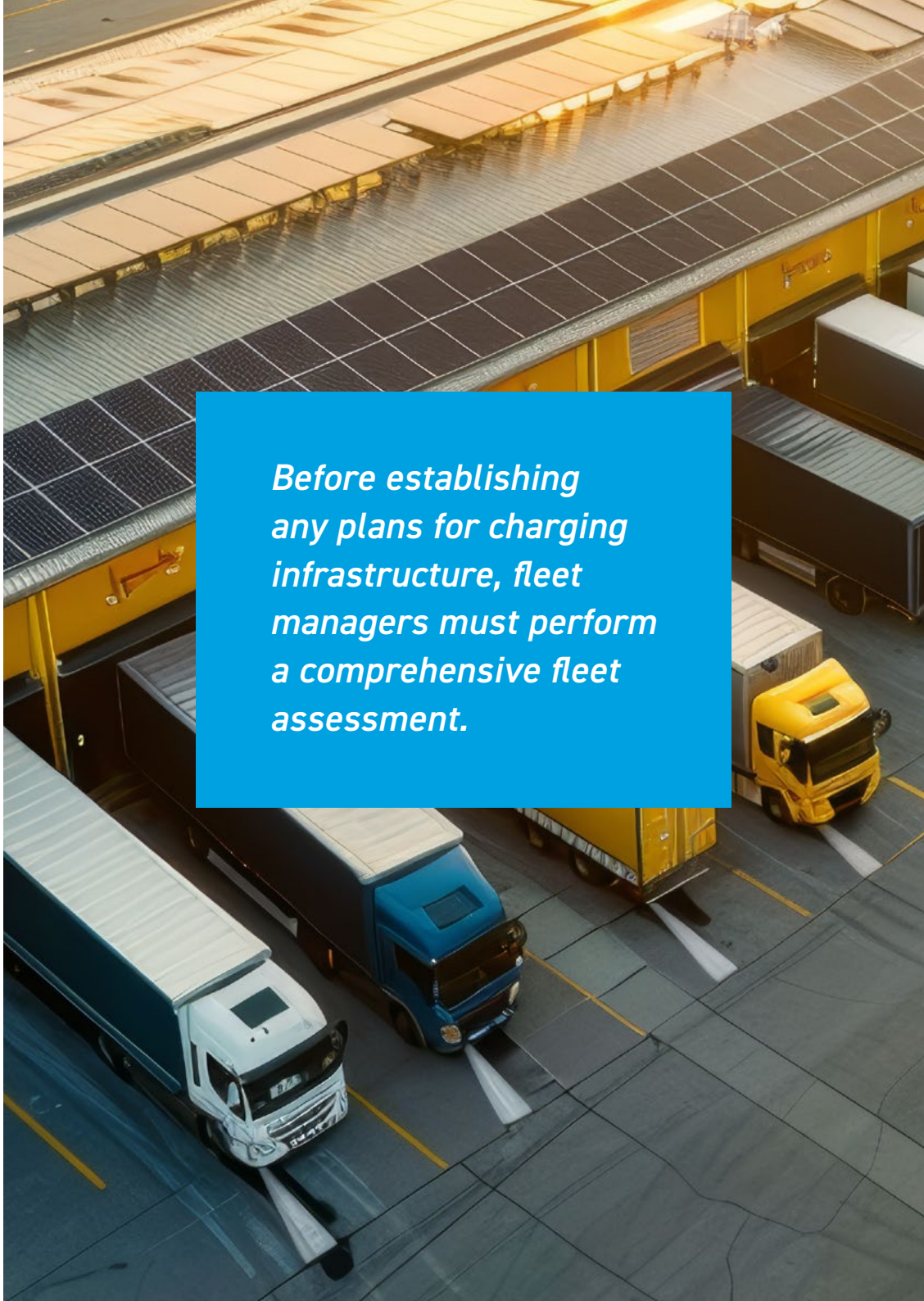
CHAPTER 2

Key Considerations When Beginning the EV Charging Infrastructure Process

Embarking on an EV charging infrastructure project requires careful planning and consideration, and should be part of a long-range, multiyear strategy. From project preparation and funding to site design and hardware selection, each aspect plays a crucial role in project success.

Before establishing any plans for charging infrastructure, fleet managers must perform a comprehensive fleet assessment. This analysis should cover the current fleet composition, operational requirements (namely, vehicle daily mileage and route considerations), and energy consumption patterns to determine the most suitable EVs and charging infrastructure for the organization.

Once you have a clear view of your target vehicles and overarching charging needs, you can proceed with the following seven steps to plan for EV charging infrastructure installation and ongoing management.



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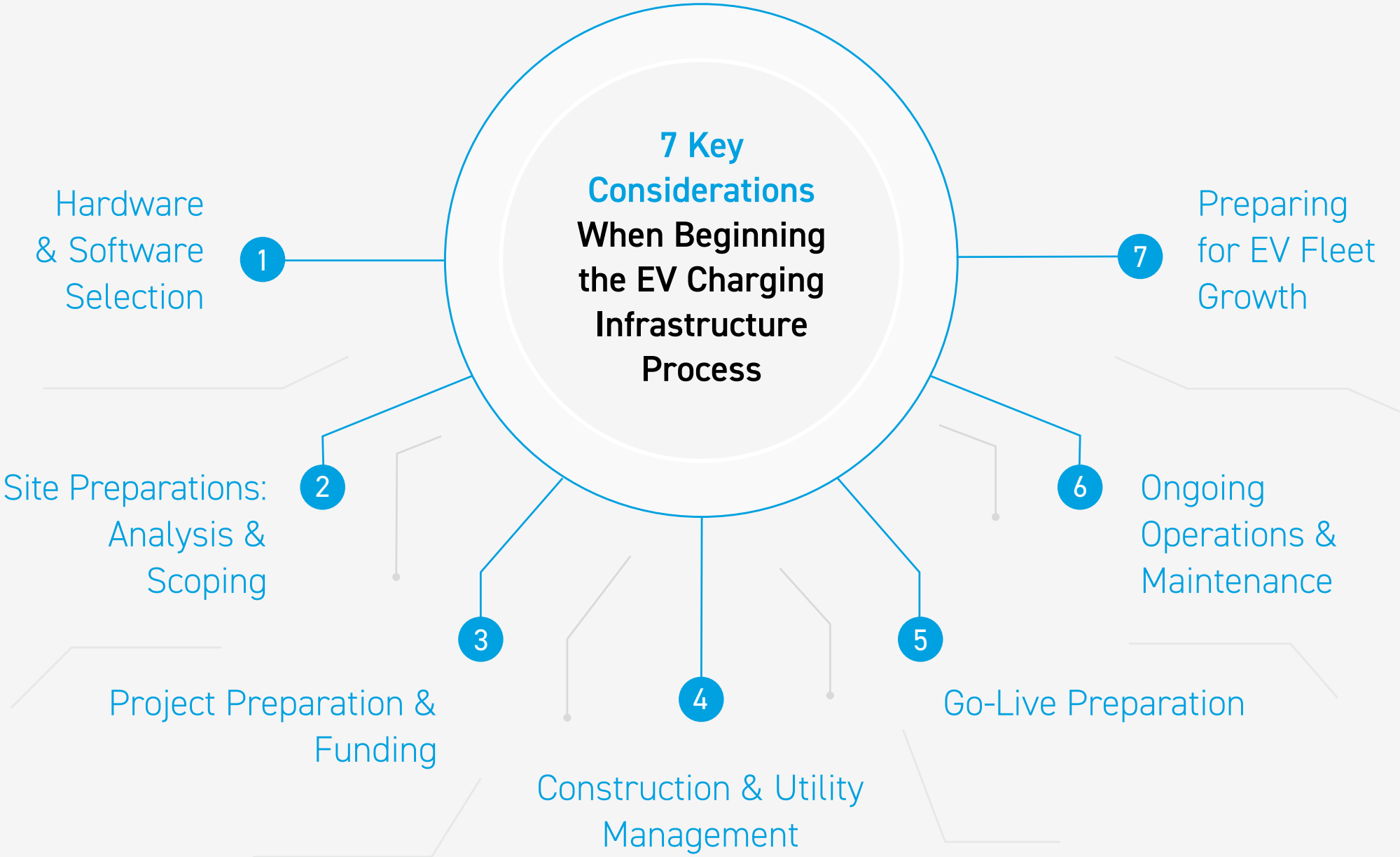
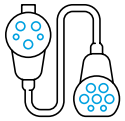

7 Key Considerations When Beginning the EV Charging Infrastructure Process
1
Hardware & Software Selection
2
Site Preparations: Analysis & Scoping
3
Project Preparation & Funding
4
Construction & Utility Management
5
Go-Live Preparation
6
Ongoing Operations & Maintenance
7
Preparing for EV Fleet Growth

1

Hardware & Software Selection

Choosing charging equipment and software represents the final step in the pre-construction phase. At this point, it's incumbent on fleet managers and other stakeholders to ensure electric vehicle supply equipment (EVSE) selection fits the larger needs of the new fleet in terms of energy demand and management capabilities, vehicle and site compatibility, battery characteristics, and the amount of time the vehicle spends charging at the depot, to name a few requirements.



EVSE Hardware Procurement

Selecting the appropriate EVSE hardware is critical for ensuring reliable and efficient charging. Factors to consider include charging speed, connector types, charging capacity, electrical demand, safety features, and compatibility with the EV fleet.

Not all charging equipment is equally effective or efficient, and some models are better suited for different fleet situations than others. Even if you choose a solid charger, a weak link elsewhere in the chain could cause issues. Fleet managers should consider the reputation, reliability, and financial health of the charging manufacturer to ensure they'll receive the necessary long-term support. Moreover, even if there is a choice of reliable technology, all the highly interdependent sub-systems must work together in concert for the entire EV charging system to function optimally.

EMS and CMS Software Provider Procurement

Energy management systems (EMS) and charging management systems (CMS) software play a vital role in optimizing charging operations, monitoring energy usage, and facilitating smart charging strategies. Proper energy management with AI-powered software like Ampcontrol can reduce the costs of electricity dispersion by as much as 40%. Procuring a reliable and feature-rich solution is essential for effective fleet management.

Interoperability Testing

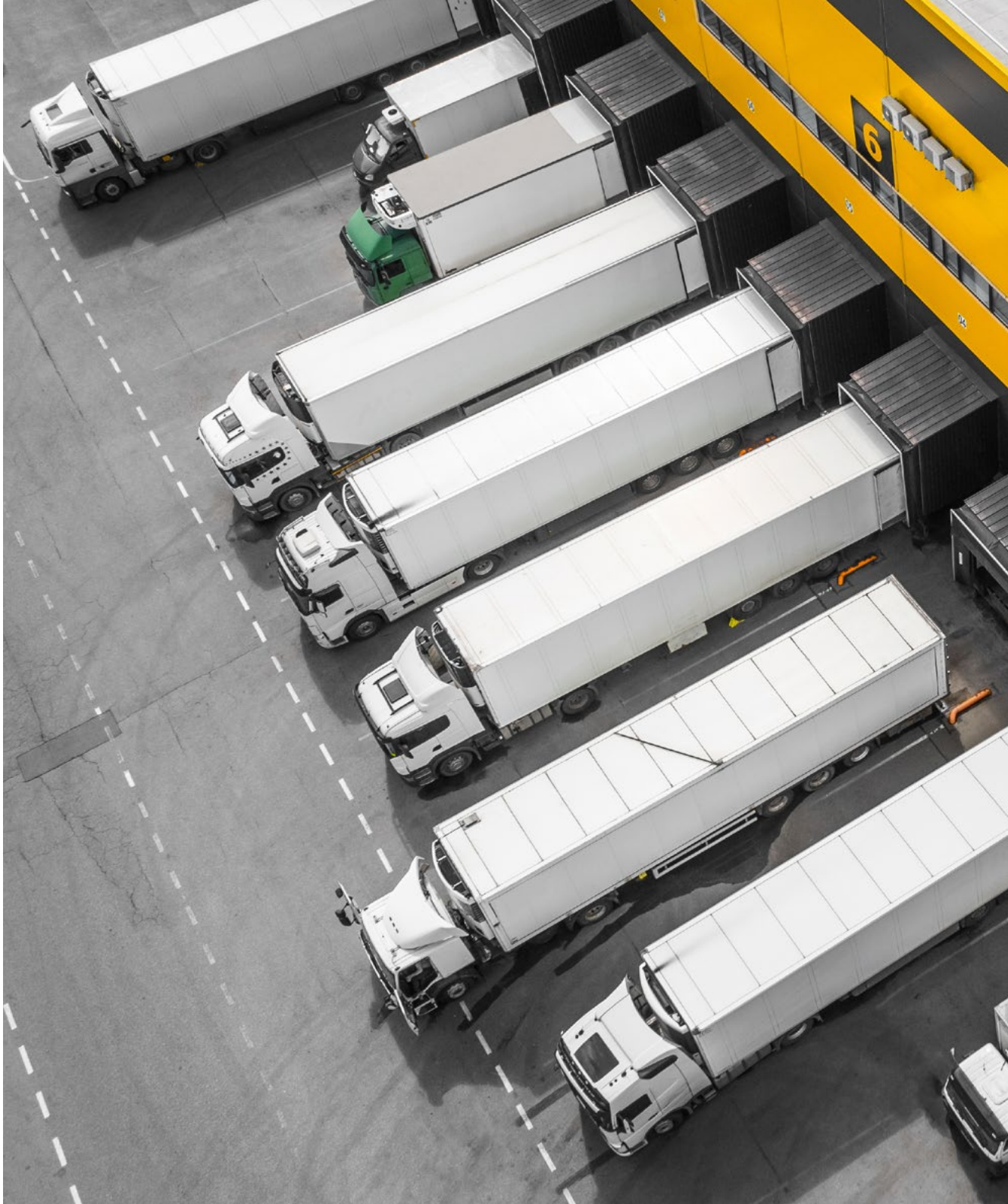
Conducting interoperability testing between the selected EVs, EVSE hardware, and software systems ensures seamless integration and functionality. This testing helps identify and resolve any compatibility issues before the charging infrastructure goes live.

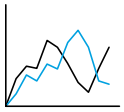
Not all charging equipment is equally effective or efficient, and some models are better suited for different fleet situations than others.

2

Site Preparations: Analysis & Scoping

This stage comprises everything from assessing site electrical needs to choosing the ideal number and location of EVSE.



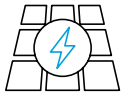


Analyzing Duty Cycles and Load Shape

Duty cycles summarize the daily flow of fleet vehicles and include aspects such as routes, mileage, and parking times and locations. With EVs, specifically, cycles include charging requirements and energy consumption profiles of your chosen vehicles. These aspects directly influence the load shape — the pattern of EV electricity consumption over time — required at your charging depot. Understanding the interplay between these two components (and how they are projected to change over time, which we will cover later in discussing scalability) is crucial for designing an optimized charging infrastructure.

Engaging Design and Engineering Firms

Experienced design and engineering firms provide expertise in site layout, electrical design, and compliance with local regulations. Professional input is crucial for designing an effective plan for site layout, electrical blueprints, and more. Involving these key players early can help avert costly oversights or planning errors.



Electrical Tariff and Onsite Energy Generation

Tariffs are set by utility companies and govern the rates customers pay for electricity at varying levels and times of consumption. Evaluating the tariff structure and exploring onsite energy generation options (such as solar photovoltaic and battery energy storage capabilities) can help optimize energy costs, reduce grid impact, and limit requirements for expanded capacity. Additionally, it's critical to bear in mind the important role utility design and standards play in this phase, influencing the ultimate landed infrastructure cost.

Experienced design and engineering firms provide expertise in site layout, electrical design, and compliance with local regulations.

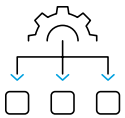
3

Project Preparation & Funding

With site analysis and scoping complete, fleet managers can shift toward project preparation and funding. The project cannot begin in earnest without a firm plan for how the new infrastructure will be funded, not to mention how it will generate a long-term return on investment (ROI). Engaging key stakeholders and securing their buy-in is a critical first step.

From senior management and finance teams to drivers and maintenance staff, it's essential to communicate the benefits of electrification and address any concerns or questions they may have. This fosters a sense of ownership and commitment among all stakeholders, setting the stage for a smooth and efficient transition.

With all stakeholders involved, this stage should cover the following four areas.



Resource Allocation and Investment

Organizations must allocate sufficient financial and human capital resources to support the EV charging infrastructure project. This includes budgeting for equipment, installation, and ongoing maintenance costs.

Return on Investment Evaluation

Assessing the ROI of the EV fleet transition is essential to justify the investment and secure stakeholder buy-in. This involves analyzing the long-term cost savings, operational efficiencies, and environmental benefits associated with fleet electrification.

Grant and Incentive Applications

Exploring and applying for available grants and incentives can significantly offset the upfront costs of installing EV charging infrastructure. Fleet managers should scour information from federal and state governments, as well as utilities, to find financial support for EV adoption and charging infrastructure development. Internal resources must be allocated to the review and analysis of these programs, not to mention the application and stakeholder alignment processes required to secure these types of funding.

Critical Expertise Allotment

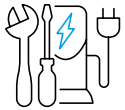
To budget (and operate) with a high degree of reliability, the team must consist of technologists who can examine a changing technology landscape for software and hardware and evaluate system networking, design, and property requirements. Once sites go live, there must be specialist contracts in place to operate and maintain the technology.

Exploring and applying for available grants and incentives can significantly offset the upfront costs of installing EV charging infrastructure.

4

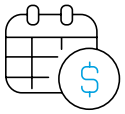
Construction & Utility Management

Now, the EV charging infrastructure project moves from planning to action. When preparing to break ground for installation, fleet managers must involve experienced contractors and project managers to coordinate critical aspects of planning and permitting. Given the complexity and duration of this type of infrastructure project, where timeframes from start to finish can range from 12 to 18 months, it's critical to onboard contractors and partners early in the process.



Electrical Contractor Procurement

Engaging a qualified and experienced electrical contractor is crucial for properly installing and commissioning the charging infrastructure. The contractor should have expertise in EV charging systems and fleet-scale charging demands and be familiar with local electrical codes and regulations.

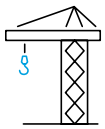


Project Management

Effective project management is vital for the successful implementation of EV charging infrastructure. This includes overseeing the construction process, coordinating with stakeholders (e.g., fleet management, procurement, legal, facilities, and ESG), managing timelines and budgets, and ensuring compliance with safety and quality standards.

Utility Permitting and Coordination

Obtaining necessary permits from local authorities and coordinating with utility companies is one of the most critical aspects of the construction process. This involves submitting required documentation, securing approvals, and ensuring the charging infrastructure meets all regulatory requirements.



Construction

The construction phase involves the physical installation of the charging equipment, electrical wiring, and any necessary site modifications. Close coordination between the electrical contractor, site owners, and project managers is essential to ensure timely and efficient execution.

Project managers should carefully consider the final location for EVSE before construction begins. By opting for dirt over concrete or situating chargers closer to the electrical source, for instance, you can minimize expensive trenching and avoid runaway costs.

5

Go-Live Preparation

When construction and installation are complete, final go-live preparations can begin. This stage includes key steps in software implementation, on-site interoperability testing, and securing driver and technician training and buy-in. It's crucial to avoid rushing through this final phase of preparation.

EMS / CMS Software Implementation

Implementing the selected energy EMS and CMS software solutions requires configuring the systems to align with the fleet's use cases and specific requirements. Software must be integrated with charging infrastructure to ensure smooth data flow and communication between the various components. Internal technical teams or external consultants will be responsible for preparing these implementations to ensure seamless execution.

On-site Interoperability Testing

After construction is completed and the meter is installed, the site is energized, and fleet electrification is integrated into your business practices. Four major milestones lie next:

1. **Commissioning the entire site:** Configuring the EVSE, setting up the network, and integrating the systems.
2. **Conducting solution operation testing:** Testing hardware, firmware, software, and vehicles to ensure they align with your specific use cases.
3. **Managing vehicle delivery:** Preparing routes and site operations. While your CaaS provider will not own the vehicles, they should coordinate every step of the vehicle supply chain. Your internal processes should be ready and fully aligned with your CaaS provider's operations.
4. **Ensuring training and operations readiness:** Achieving the Commercial Operations Date (COD), where the site becomes fully operational and billing begins. All operational practices should be aligned with your CaaS provider's service level agreement (SLA).

Training for Drivers and Technicians

Providing comprehensive training to drivers, yard technicians, and management is essential for the successful launch, smooth transition, and ongoing operation of the EV fleet. Without driver buy-in, the new EV fleet is likely to fail. This includes educating team members on charging procedures, vehicle use and maintenance, safety protocols, and daily operations procedures and best practices. Training should emphasize key benefits to drivers, such as reduced physical strain from a smoother ride, less exposure to diesel fumes, and decreased noise.

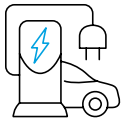
LCFS Broker Procurement for Carbon Credits

California, Oregon, and Washington have implemented low carbon fuel standard (LCFS) programs, and many other states are considering similar legislation offering opportunities for EVSE owners to generate credits for clean fuel generation.[13] Where available, participation in LCFS programs can provide additional financial benefits for EV fleet operators. Procuring an LCFS broker early in the process can help navigate the complexities of the carbon credit market and maximize the value of the fleet's environmental performance.

6

Ongoing Operations & Maintenance

The EV fleet transition is far from finished after the switch is flipped. Establishing effective plans and practices for ongoing operations and maintenance is essential for the long-term success of the project.



Designing 99% Uptime Into Your Processes

Ensuring a high level of uptime is crucial for the reliable operation of any EV fleet. This involves designing robust processes, implementing redundancy measures, and establishing proactive monitoring and mitigation to minimize downtime and maintain optimal performance.

Having access to 24/7 support and reliable preventative maintenance coverage is particularly important for ensuring consistent uptime. Critical spare parts for EVSE should be available and accessible onsite to avoid costly repair delays.

O&M Procurement

Having an established operations blueprint with a tiered framework and personnel for 24x7x365 monitoring and maintenance ensures the long-term reliability and effectiveness of the charging infrastructure and provides a level of customer support for successful fleet electrification. This includes proactive monitoring and corrective and preventive maintenance programs to maintain uptime.

While charger companies may provide SLAs for their equipment, response times can vary. For example, some companies may take up to five days to ship a replacement part in case of a failure. This highlights the importance of having a comprehensive maintenance strategy and partnering with reliable service providers to ensure minimal downtime.

Monitor Reliability and Performance

Proactive monitoring of the reliability and performance of the charging infrastructure is vital for identifying and addressing any anomalies and mitigating issues promptly. This involves tracking key performance indicators (KPIs), conducting regular audits, and implementing a robust maintenance management system. Critical factors include:

- Vehicle charging schedule
- Monitoring and deviation alarming
- Site data analysis
- Regular periodic EVSE inspection
- Planned site infrastructure inspection and maintenance

Likewise, continuously monitoring and optimizing energy usage is essential for minimizing costs and maximizing the efficiency of charging infrastructure. Fleet managers must regularly analyze energy consumption patterns, implement smart charging strategies, and leverage data analytics to identify opportunities for improvement.

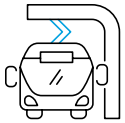
ESG Analytics and Reporting

Tracking and reporting on environmental, social, and governance (ESG) metrics is becoming increasingly important for organizations. Leveraging data analytics to measure and communicate the environmental benefits of the EV fleet, such as reduced carbon emissions and improved air quality, can enhance the organization's sustainability credentials and attract additional stakeholder support.

7

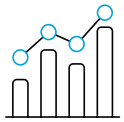
Preparing for EV Fleet Growth

As the EV fleet expands and the organization's electrification goals evolve, it is essential to plan for scalability and future growth. Long before expansion is necessary, fleet operators must conduct regular assessments of existing charging infrastructure, develop a scalability plan, and procure additional EVs to meet growing demand. Futureproofing the EV fleet is foundational for continued growth and expansion.



Assessing Charging Infrastructure

Regularly evaluating the capacity and utilization of the existing charging infrastructure helps identify potential bottlenecks and plan for future expansion. Key tasks include analyzing charging data, monitoring peak demand periods, and assessing overall system performance.



Developing a Scalability Plan

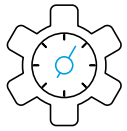
Based on the assessment of the current infrastructure and projected growth of the EV fleet, operators should develop a comprehensive scalability plan. This plan should outline the phased expansion of the charging infrastructure, including the installation of additional charging points, upgrades to electrical capacity, and the implementation of advanced energy management systems.

Planning for and Procuring Additional EVs

As the EV fleet grows, organizations must carefully plan for and procure additional vehicles to meet expanding operational needs. This includes evaluating the suitability of new EV models and considering factors such as range, charging requirements, and payload capacity. Engaging with EV manufacturers and leasing companies can help secure favorable terms and ensure a smooth procurement process.

Managing Expansion Without Disruption

Expanding the EV fleet and charging infrastructure while maintaining uninterrupted operations can be complex. Effective project management is essential to ensure a seamless transition and minimize disruption to existing services. Fleet operators must plan carefully, coordinate with stakeholders, and implement phased deployment strategies to gradually integrate new vehicles and charging facilities into the fleet. Additionally, aligning timelines and plans with automotive OEMs, dealerships, and infrastructure providers helps ensure that new vehicle delivery syncs with infrastructure development so that vehicles aren't delivered before charging is ready.



Futureproofing Your EV charging Infrastructure

Futureproofing involves preparing the existing switchgear for future expansion to limit the need for additional excavation and rewiring later. This process may cause significant site disruption, such as excavating pavement and trenching, and the installation of sub-surface elements. Preparing for these additions in advance will minimize these costly disturbances down the road.

Laying the groundwork for your charging infrastructure and establishing an appropriate plan for scaling operations takes research and smart decisions. By investing time and resources into futureproofing your charging infrastructure, you can ensure your organization is well positioned to handle the increasing demand for charging as your EV fleet expands.

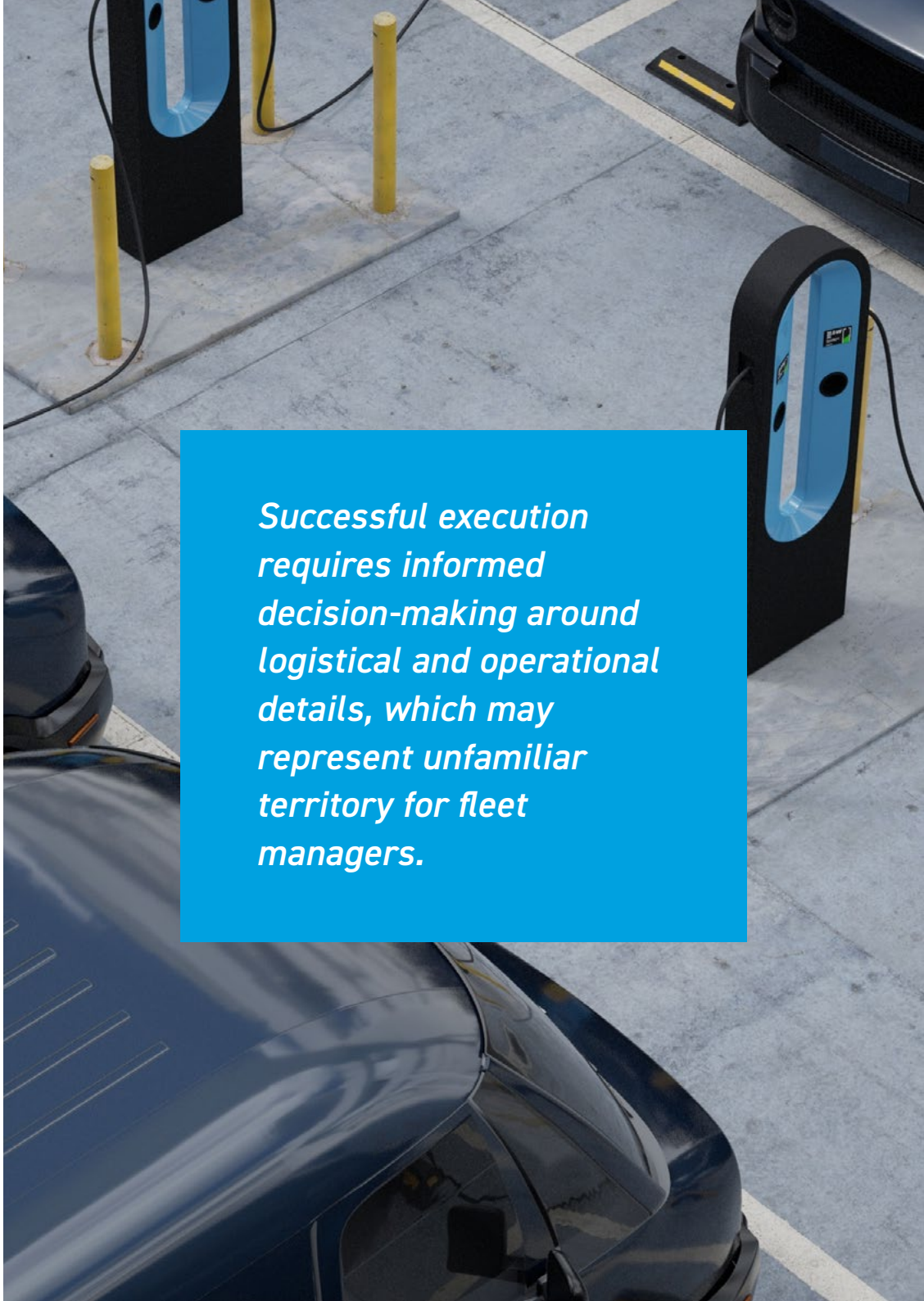
CHAPTER 3

Deciding Between DIY or Charging-as-a-Service (CaaS)

Building charging infrastructure to support your EV fleet transition is clearly a complex process that involves detailed planning and careful research at every stage. Successful execution requires informed decision-making around logistical and operational details, which may represent unfamiliar territory for fleet managers.

Because of these complexities, the choice of how to tackle the electrification process is one of the most important decisions you'll make. Fleet managers must determine whether to handle it on their own or with the help of a partner.

In this final chapter, we'll compare these approaches and make the case against taking a DIY approach to fleet electrification.



Successful execution requires informed decision-making around logistical and operational details, which may represent unfamiliar territory for fleet managers.

The Pitfalls of DIY Electrification

While the idea of managing fleet electrification in-house may seem appealing, it's important to understand the hidden costs and complexities associated with DIY electrification.

Inadequate planning, lack of expertise in charging equipment and infrastructure design and integration, and challenges in navigating regulatory requirements are just a few of the pitfalls that can hinder the success of your electrification efforts.

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Charging-as-a-Service	DIY
✓ Professional expertise in electric power supply, utility integration and infrastructure	✗ Requires building an in-house power, utility and energy management team
✓ Zero-volatility with predictable energy pricing	✗ Energy pricing is subject to rate, fuel costs and intraday/time-of-use cost fluctuations
✓ Technology risk elimination	✗ Requires in-house expertise to vet charging technology
✓ Capital risk elimination with multiyear program capital commitment	✗ Upfront and recurring capital funding needed to build and expand
✓ Performance commitment @ 99%+ uptime	✗ No performance guarantees – requires incremental investment over time to support fleet use case
✓ Potential to generate up to 70% in lifetime savings vs. DIY	✗ Higher upfront and ongoing costs

DIY electrification can be up to 70% more expensive than working with a reputable partner.

Executing the project on your own essentially requires hiring an in-house power, utility, and energy management team to provide the necessary expertise.

Additionally, DIY electrification is often much more costly than fleet managers realize. Even with tax credits and incentives, organizations may struggle to foot the bill for charging equipment, electrical upgrades, site preparation, and more. Doing so often requires substantial capital investment, both up front and at times of expansion. Not only that, but electricity pricing is subject to a host of market dynamics, resulting in price fluctuations and difficulty in forecasting long-term costs and profitability.

It's also worth noting that EVSE providers often focus solely on selling their equipment and may not provide comprehensive support for the entire construction process, not to mention long-term maintenance needs. This can leave organizations grappling with unexpected challenges and additional costs as they navigate the complexities of installation, integration, and ongoing management.

All told, DIY electrification can be up to 70% more expensive than working with a reputable partner. With no performance guarantees from building your own EV fleet and charging infrastructure, that's a significant risk.

Charging-as-a-Service (CaaS): A Closer Look

Fortunately, there's an alternative to the DIY approach. Charging-as-a-Service (CaaS) has emerged as a game-changing solution for fleet electrification, offering a streamlined and cost-effective option for establishing EV charging infrastructure. CaaS providers partner with customers to orchestrate the fleet electrification journey from onboarding and infrastructure design and build-out to education, training, and ongoing management.

CaaS is a comprehensive solution that includes the installation, management, and maintenance of EV charging equipment, as well as the delivery of electricity to the vehicles. By adopting a CaaS model, fleet managers can focus on their core operations — the major KPIs that drive their business — while leaving the complexities of EV charging to experienced professionals.

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Why Choose Electrada's 360 CaaS?

Electrada's **360 CaaS** is a complete electric fuel solution that offers a range of benefits for fleet managers embarking on the electrification journey. With a 100% capitalized approach, Electrada absorbs all the upfront costs of charging infrastructure and equipment, allowing organizations to preserve their capital for other strategic initiatives and mitigate their financial risk. Electrada also orchestrates the fleet electrification journey with customer stakeholders and partners to ensure a holistic customer experience aligned with customer success metrics.

Electrada's **360 CaaS** solution stands out in the market, offering a guaranteed, predictable, and capped rate per kilowatt-hour for the life of the customer relationship and ensuring 99% guaranteed uptime. With complete coverage for preventative maintenance, remote connectivity for support, and critical spare parts stored onsite, Electrada provides comprehensive, rapid support to keep CaaS customers online at every hour of the day. This level of reliability is essential for fleet operations, as downtime can significantly impact productivity and profitability.

360 CaaS also includes locked-in electric fuel rates for the entirety of the long-term (5+ year) contract, ensuring that fleet managers can accurately forecast and budget for their energy expenses. This degree of predictability is crucial for effective fleet management and long-term planning.

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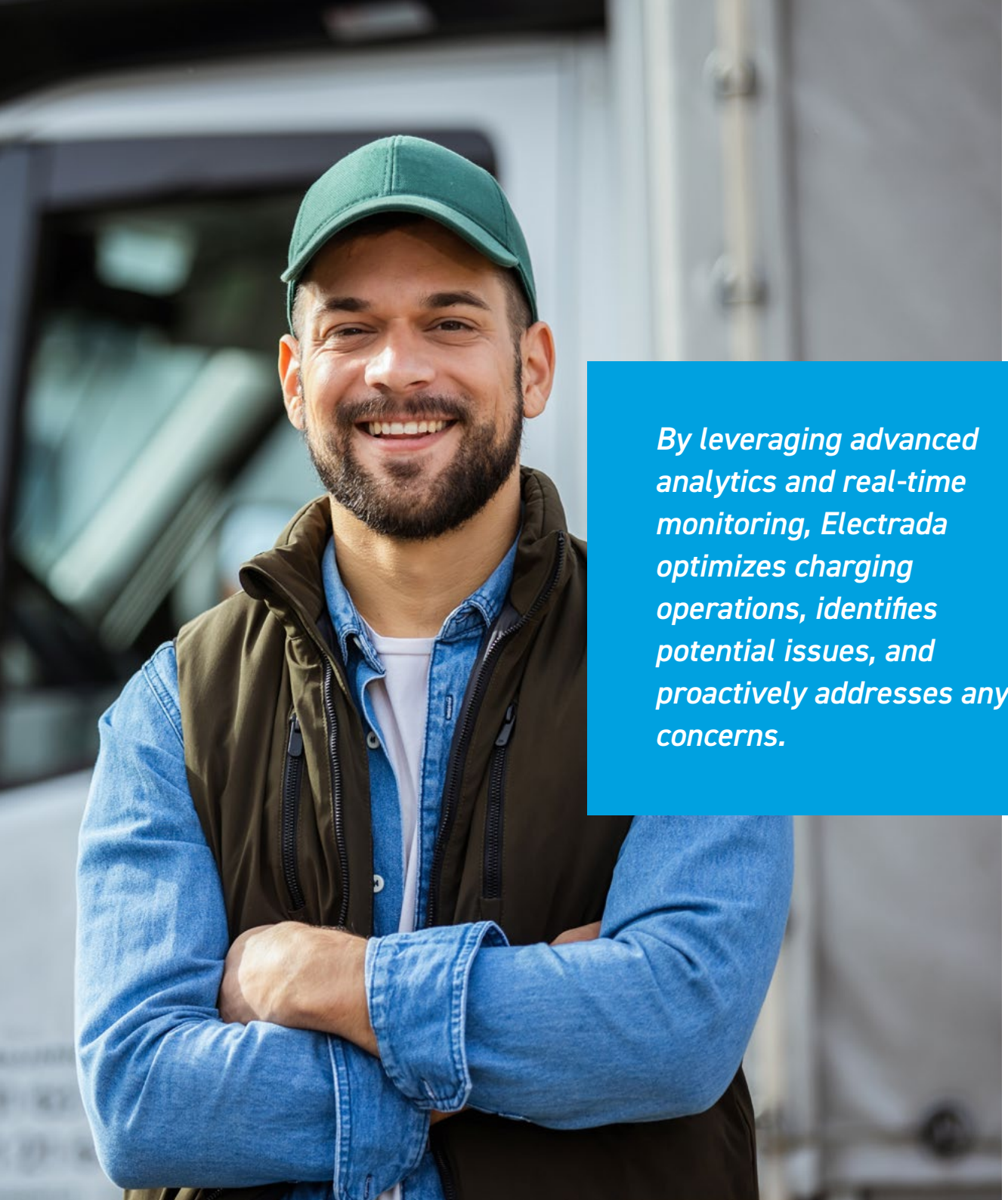


By leveraging advanced analytics and real-time monitoring, Electrada optimizes charging operations, identifies potential issues, and proactively addresses any concerns.

Electrada's data-driven insights and 24/7/365 support services further differentiate **360 CaaS** from other CaaS offerings. By leveraging advanced analytics and real-time monitoring, Electrada optimizes charging operations, identifies potential issues, and proactively addresses any concerns. This standard of support ensures fleet managers have access to the expertise and resources they need to maximize the efficiency and reliability of their EV charging infrastructure.

The Electrada team brings decades of expertise in industries core to the e-mobility revolution: utilities, energy, microgrid, transportation, asset development, and more. This depth equips us to seamlessly employ and manage the many components needed to deliver a complete, robust, and reliable electric fuel solution. Whether you're navigating utility requirements, energy management, construction planning, or regulatory landscapes, Electrada's team of experts will guide you through a smooth and efficient electrification process.

A CASE STUDY

Real-World Success With Electrada

Ferguson Enterprises is one example among numerous Electrada customers that have leveraged **360 CaaS** to accelerate their EV fleet transition. As a $29-billion distributor of plumbing, HVAC and related building supplies to a network of 1 million customers and suppliers, Ferguson maintains a 5,300-unit vehicle fleet that consumes over 8 million gallons of diesel fuel annually.

In 2023, Ferguson reached out to Electrada to establish a partnership for a multi-phased, complete electric fuel solution for class 6 and class 8 trucks across multiple sites in California. This required a mix of Level 2 and Level 3 DC fast charging ports and involved three major California utility companies.

By leaning on Electrada for planning, installing, and managing its new EV charging infrastructure, Ferguson was able to keep upfront costs low and experience 99% uptime in its charging operations. The initial portion of its electrified fleet now travels nearly 1 million zero-emission miles annually.

FERGUSON®

SITE LOCATION

Phase 1 Sites:

5 locations across California

VEHICLES

30 Peterbilt and Freightliner Box Trucks and Tractors

UTILITIES

SMUD, SCE and PG&E

EVSE

30 Level 2 and Level 3 DC charging ports

PERFORMANCE

99%
Uptime

1 million
Zero-emission miles traveled annually

> ***By leaning on Electrada for planning, installing, and managing its new EV charging infrastructure, Ferguson was able to keep upfront costs low and experience 99% uptime in its charging operations.***

Navigate Fleet Electrification With Ease

Fleet electrification is no longer a distant vision — it's a reality that organizations must embrace to remain competitive, comply with regulations, and contribute to a more sustainable future. As the world transitions towards cleaner transportation, fleet managers play a crucial role in driving this change within their organizations. Throughout this guide, we have explored the various aspects of fleet electrification,

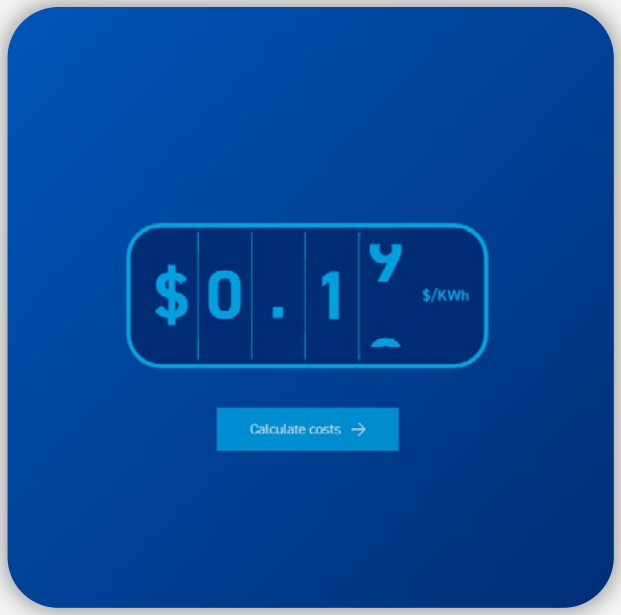
from understanding its benefits and challenges to navigating the complexities of charging infrastructure and futureproofing strategies. We have also highlighted the importance of partnering with experienced providers like Electrada to leverage innovative solutions like **360 Charging-as-a-Service** to streamline the electrification process and mitigate risks.

As you embark on your fleet electrification journey, remember that success lies in careful planning, early stakeholder engagement, and the willingness to adapt to new technologies and operational processes. By leveraging the insights and strategies presented here, you can confidently navigate the transition to an electric fleet and position your organization as a leader in sustainable transportation.

The future of fleet management is electric, and the time to act is now.

The future of fleet management is electric, and the time to act is now. Electrada's team of experts offers strategic guidance and support throughout the entire electrification process, from initial planning and infrastructure deployment to ongoing management and optimization. By leveraging our expertise and **360 CaaS** complete electric fuel solution, you can navigate the complexities of fleet electrification with confidence.

Want to Dive Deeper?



In less than 60 seconds, Electrada's rate calculator can accurately estimate your EV fleet's cost of CaaS and cost per mile right out of the gate.
Click **here** to give it a try.

Calculate My Rate Now! →

Are you ready to discover how the content in this guide relates to your unique fleet electrification needs?
Get in touch, and a member of the Electrada team will be happy to reach out.

Get in Touch →

RELATED READING

- Demystifying the Economics of EV Fleet Adoption: Beyond Upfront Costs (https://electrada.com/beyond-upfront-costs/)
- Calculating the Cost of Powering Your EV Fleet: A Quick Reference Guide (https://electrada.com/the-cost-of-powering-your-ev-fleet/)
- Futureproofing with Scalable EV Charging Solutions (https://electrada.com/futureproofing-with-scalable-ev-charging-solutions/)
- Charging into the Future: The Role of Charging-as-a-Service (CaaS) in Government Fleet Electrification (https://electrada.com/charging-into-the-future/)

FOOTNOTES

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3. International Energy Agency. "Trends in heavy electric vehicles."
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5. California Air Resources Board. "California moves to accelerate to 100% new zero-emission vehicle sales by 2035."
6. Alternative Fuels Data Center. "Emissions from Electric Vehicles."
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8. Environmental Defense Fund. "Electric Vehicle Total Cost of Ownership Analysis."
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10. Pew Research Center. "Electric Vehicle Charging Infrastructure in the U.S."
11. American Transportation Research Institute. "Charging Infrastructure Challenges for the U.S. Electric Vehicle Fleet."
12. Green.org. "Charging Ahead: The Evolution of EV Charging Technology."
13. Rocky Mountain Institute. "How States Can Use Low-Carbon Fuel Standards to Incentivize Clean Hydrogen-Derived Fuels."