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# How to Succeed with Fleet Electrification

A comprehensive guide to ensure operational success

In this document we discuss: the key drivers of fleet electrification, the primary barriers our customers face (and their solutions), and the keys to operational success.



## Executive Summary

The future of transportation is electric, and the EV sector is at a tipping point. Millions of fleet vehicles will go electric in the coming years, requiring charging infrastructure that supports the essential services fleet vehicles provide. EVgo is here to help.



### Fleet operators who decarbonize unlock operational, financial, and environmental benefits:

- ▶ **Lower total cost of ownership:** Lower maintenance and fuel costs mean electric fleets are cheaper to operate over the life of a vehicle.
- ▶ **Incentives:** Utilities and governments are investing billions of dollars to help fleets electrify.
- ▶ **Sustainability:** Transportation is the nation's largest source of emissions. Fleet electrification can help organizations make significant progress towards meeting sustainability goals.
- ▶ **Regulatory:** Regulators are pushing towards vehicle electrification requirements, and there are benefits to getting started now.



### Electric vehicles are an emerging segment that's undergoing production scale-up and proliferation of model types:

- ▶ **Upfront purchase price:** Upfront vehicle purchase prices can be higher today than fossil fuel powered vehicles. Fortunately, prices are falling as the sector scales, and grants available today can help reduce purchase costs of EVs.
- ▶ **Limited vehicle options:** Options for medium and heavy-duty vehicles are currently limited, but new options are coming at an unprecedented speed. For example, Ford has announced an "E-Transit" van for 2022, GM recently committed to being all-electric by 2035, and new market entrants are producing electric vans and trucks as well.
- ▶ **Picking the right charging solutions:** Deploying infrastructure goes beyond picking hardware. Fleet operators need the right combination of equipment, software, system design, and business integration.
- ▶ **Managing load and vehicle range:** Fleet operators must learn a new system (and language) for fueling and managing their fleets, but charging partners help the transition by providing education, support, and simple management tools.



### Capturing the benefits of fleet electrification: EVgo's lessons learned

- ▶ **Build a data-driven fleet transition plan:** Perform a baseline evaluation to minimize total lifetime cost of ownership, quantify goals and plans, and continue to refine with results.
- ▶ **Take a holistic approach:** Plan integrated and holistic vehicle and charging capability solutions, which include open standards-based hardware and software.
- ▶ **Prioritize infrastructure deployment expertise in a partner:** This is a commonly underestimated step, but deployment can be complicated, and experience is critical for successful fleet electrification.
- ▶ **Have a plan for ongoing operations and maintenance:** Select an experienced charging partner that prioritizes reliability through ongoing O&M support.
- ▶ **Learn and adapt:** Take a modular approach and stay flexible in order to capitalize on the learning taking place as the industry evolves.





# Transportation Electrification Is at a Tipping Point

The electric future is here.

Globally, automakers have announced more than \$300 Billion of electric vehicle (EV) investments. Roughly \$35 Billion of those investments are coming into the United States. There are over 300 light-duty EV models and more than 90 medium- and heavy-duty EV models available today. In the next two years, the number of medium- and heavy-duty EV models is expected to grow to over 200.<sup>1</sup>

Regulations are also driving the transition to electric. For light-duty fleets, California is mandating 100% zero emissions light-duty vehicle sales by 2035. And by 2040 all medium- and heavy-duty vehicles sold in California will be required to be zero emissions. This transition to EVs is already underway in California, and other states aren't far behind, with states like Massachusetts and New Jersey undertaking similar actions. California's regulations set the standard, and other states and national regulations will follow. In January, 2021, President Biden signed an executive order to electrify the federal government's fleet of 645,000 vehicles, showing the federal government's commitment to an electric future and helping further advance the market.

However, this tipping point is not simply driven by regulations. From a total cost of ownership (TCO) perspective, electric fleet vehicles are seeing a rapid cost decline due to battery cost decreases, production economies of scale, lower operating & maintenance costs over the life of the vehicle, and incentives, which combine to make many EVs cheaper than internal combustion engines (ICE).

As fleets evolve, don't be left behind — the future is *electric*.

## Key Drivers



\$300 Billion in EV  
investments worldwide



Regulations are  
accelerating the  
transition to electric



Lower total cost of  
ownership (TCO) for  
electric fleets



1. State of Sustainable Fleets 2020 - Battery Electric. Page 84.  
<https://www.stateofsustainablefleets.com/>

# The Case for Fleet Electrification

Fleet operators who decarbonize their light-, medium-, and heavy-duty fleets receive the following benefits: lower total cost of ownership, taking advantage of incentives, leading on corporate sustainability, and meeting regulations.



1. Lower  
Total Cost of  
Ownership (TCO)



2. Availability  
of Incentives



3. Lead on  
Corporate  
Sustainability



4. Regulatory  
Compliance

## 1. Lower total cost of ownership (TCO)

Most fleet operators (unlike passenger vehicle owners) take a TCO or cost per vehicle miles traveled (VMT) view when evaluating alternative vehicle technologies. This view includes everything from vehicle acquisition cost, charging infrastructure, maintenance, energy (i.e. fuel) consumption, and incentives.

### ► EV Prices Are Going Down:

The main cost of EVs—the battery—has declined as much as 80% over the last eight years. Further cost declines of over 50% are expected in the next decade, which should put upfront costs of many EVs below their conventional competitors by 2030.<sup>2</sup> Even today, the upfront cost can be significantly reduced by leveraging available grants and incentives.

### ► EV Maintenance Costs are Lower:

All-electric EVs use highly efficient drive systems and have a simpler design with fewer moving parts than ICE vehicles. This offers considerable maintenance savings compared to conventional vehicles. Over the life of an EV, reduced maintenance costs could result in hundreds or thousands of dollars in savings, up to 70% in savings as compared to ICE vehicles depending on how the vehicle is driven.<sup>3</sup>

### ► Electricity is Cheaper Fuel:

With ICE vehicle fleets, fueling costs for gasoline or diesel represent up to 1/3 of the total cost of ownership over the life of the vehicle. Furthermore, gasoline and diesel prices can be highly volatile. Electricity as a fuel source, in contrast, offers more price-certainty with the stability of electricity rates (i.e. tariffs). Increasing penetration of renewable energy continues to decrease electricity costs. In addition, utilities around the country are also releasing specific EV commercial rates to further reduce EV fueling costs, allowing fleets to save even more.

EVs also provide the ability to further reduce the cost of fuel by optimizing charging schedules and charging when electricity prices are lowest. This optimization is not possible for traditional fleet fuels, due to the pre-purchase, transport, and storage requirements of gasoline and diesel. The cost of fuel can be arbitrated in near real time with EVs while traditional fuels can only be hedged. The upshot is that the fuel to power an EV (i.e. electricity) often costs less on a \$/mile traveled basis than gasoline- and diesel-powered vehicles. It is possible to attain significant fuel cost reductions, especially with a well-managed charging plan.

### Lower Costs Include



Declining Cost of  
Vehicle Purchase



Lower Cost of  
Maintenance



Lower Cost of Fuel

2. Union of Concerned Scientists. "EV Batteries: Materials, Cost, Lifespan." March 9, 2018.

3. <https://energi.media/canada/costs-of-driving-evs-quickly-becoming-competitive-with-conventional-vehicles-neb/>

## 2. Availability of incentives

Utilities and governments are investing billions of dollars to help fleets electrify. Fleets can access incentives, rebates, and grants on the vehicles, charging infrastructure, installation, and even fuel switching bonus payments for transitioning from gasoline and diesel to electric. There are currently over 120 different incentive programs across the U.S. at the state and federal levels promoting the electrification of transportation, many of which are specifically focused on fleets.<sup>4</sup> With each incentive program being unique, it can be valuable to work with partners that have extensive knowledge of this space, especially for fleets that span multiple territories and states to maximize funding opportunities.

## 3. Lead on corporate sustainability

According to a seminal survey conducted by Greenbiz and UPS, primary motivators for electrifying fleets are: achieving sustainability goals (83% of respondents) and reducing TCO (64%).<sup>5</sup>

Many corporations have made ambitious pledges to achieve net zero emissions targets, and transportation is a **major** emissions contributor. The transportation sector generates the largest share of greenhouse gas (GHG) emissions (28%) across the country and is growing. For California, the transportation sector alone accounts for 40% of statewide emissions.

According to the American Health Association, the transportation sector is a leading contributor to air pollution. With nearly half of the U.S. population living with unhealthy air, air pollution is a top 3 leading cause of lung disease. The electrification of transportation would save \$72 billion in health-related benefits and avoid more than 6,000 premature deaths by 2050.<sup>6</sup> Companies like Amazon,<sup>7</sup> DHL,<sup>8</sup> and Lyft<sup>9</sup> and many public agencies all have ambitious sustainability goals and are deploying EVs as part of their core business operations.



### Save Lives

Electrification would help avoid more than 6,000 premature deaths by 2050



### Save Money

Electrification would save more than \$72 billion in health-related benefits

### Illustrative Companies Actively Deploying EVs

amazon

DHL

lyft

## 4. Regulatory compliance

From regionally focused regulations like California's Advanced Clean Truck rule to international agreements like the Paris Climate Accord, public and private fleets are navigating how to manage emissions-free zones and legislative bans on ICE vehicles.<sup>10</sup> Fleets that start to electrify early will secure a competitive advantage as regulations target reducing transportation emissions.

4. <https://www.act-news.com/funding-programs/>

5. [https://sustainability.ups.com/media/UPS\\_GreenBiz\\_Whitepaper\\_v2.pdf](https://sustainability.ups.com/media/UPS_GreenBiz_Whitepaper_v2.pdf)

6. <https://www.lung.org/clean-air/electric-vehicle-report>

7. <https://www.cnn.com/2019/09/19/amazon-is-purchasing-100000-rivian-electric-vans.html>

8. <https://www.businessinsider.com/dhl-brings-electric-vehicle-pilot-to-us-2019-12?r=US&IR=T>

9. <https://www.smartcitiesdive.com/news/lyft-adds-200-evs-to-denver-rental-program/567456/>

10. <https://www.bloomberg.com/news/articles/2020-12-02/joe-biden-plan-to-fight-climate-change-could-sell-25-million-electric-cars>

# Barriers to Fleet Electrification

Although there is little doubt that transportation electrification is the future, the electric vehicle market is still in a nascent stage. Early market inhibitors include the initial purchase price of EVs, limited availability of vehicle options, optimizing vehicle battery range, understanding and implementing a new “fueling” system, and managing on-site electric load and charging infrastructure. Luckily, EVgo has been at the forefront of electric vehicle infrastructure for more than 10 years, and we have the solutions to overcome these barriers.



## Barrier 1: Initial purchase price of EVs

Although prices are going down, the purchase price of EVs is often higher today than a comparably-sized gasoline or diesel vehicle. Fortunately, fleet operators tend to take a TCO and payback period view when making vehicle purchases, enabling recognition that electrification saves money in the long-term.

### How EVgo can help:

TCO factors in both ongoing operations and fuel savings. EVgo can play a big role in ensuring a lower TCO for fleets by helping to maximize fuel savings and accrue benefits of incentives and tax credits. EVgo has our own Fleet TCO Analysis tool to provide quantitative analysis to support planning a smart fleet transition plan. EVgo also offers flexible ownership models including Charging as a Service (ChaaS) to help reduce the upfront CapEx burden.

## Barrier 2: Limited vehicle options

The current availability of EV options depends on the use case. Although there are currently a variety of options for light duty vehicles (e.g. suitable for passenger transport and food delivery fleets), options for medium- and heavy-duty vehicles are currently somewhat limited. This will change rapidly, as production of larger EVs ramps. It is predicted that there will be roughly 200 medium- and heavy-duty vehicle models commercially available in the next 2 years.<sup>11</sup>

### Barriers & Solutions



#### Initial Purchase Price

EVgo can help you get the lowest cost per VMT and tax credits



#### Limited Vehicle Options

EVgo works proactively with OEMs to ensure interoperability

11. State of Sustainable Fleets 2020 - Battery Electric. Page 84.  
<https://www.stateofsustainablefleets.com/>

#### How EVgo can help:

EVgo works proactively with automotive OEMs to ensure interoperability of our charging solutions with the expanding vehicle market. This offers fleets the choice to select the optimal mix of chargers to meet their specific use cases and needs over time, with performance and reliability at the forefront.

## Barrier 3: Deploying on-site “Behind the Fence” charging infrastructure

Sorting out the whole gamut of charging infrastructure is a huge challenge for fleets doing this for the first time. Fleet managers have to determine the best mix of charging equipment, including the power level (L2 vs DCFC) and equipment manufacturer(s) that can best meet the fleet reliability and cost needs. The equipment needs to be installed, which requires designing a site layout to optimize charging, and possibly upgrading site power to meet power requirements. Additionally, fleets need to engage with utilities and local government authorities in the planning and permitting processes.

#### How EVgo can help:

EVgo has years of experience and expertise in working directly with utilities, electric contractors, permitting, and city regulators. Our turnkey solutions deploy infrastructure seamlessly and tailored to fleet-specific needs, matching routes and dwell times to the optimal mix of chargers—L2, 50kW, 100 to 350 kW, and beyond. We handle all of the steps: from initial consultation, to site selection and design, to equipment procurement, to site construction, utility interconnection, and to site commissioning for operations.

## Barrier 4: Managing on-site electrical load and vehicle range

Recharging an EV is different from refilling a gasoline engine. Electric fleet managers must learn a new system of fueling driven by kWh, kW, amps and volts. It takes more time to charge an EV than fuel an ICE vehicle. If charging is not well-managed, it is possible to incur high electricity bills, or for fleet vehicles to not be charged and ready for their daily shifts. Drivers also face a learning curve when understanding the vehicle's range, as well as how this varies based on vehicle routes, weather, and driving patterns.

#### How EVgo can help:

For businesses, minimizing costs while maximizing fleet uptime is critical. Fleet operators can utilize our EVgo's expertise in planning for their own transition to electric to find the perfect hardware mix. EVgo then helps fleet customers optimize to the the perfect charging solution (including optimization of charging schedules) to ensure that fleet vehicles are always charged and ready when needed, while also managing electricity bills. We provide data dashboards and data analytics to help demystify the new fleet fueling language and ensure that fleet vehicles have the range they need to support their operations.

### Barriers & Solutions



#### Deploying Infrastructure

EVgo has turnkey solutions for all phases of infrastructure deployment



#### EV Load Management

EVgo has 'smart' chargers and software to keep costs low while ensuring fleet uptime

# Keys to Operational Success

EVgo has been at the forefront of fleet electrification, so we have both a first mover and a first *learner* advantage. To succeed in electrification, it is important to leverage industry experience, embrace data and learning, take a holistic approach, and utilize expertise when selecting partners. Finally it is critical to have a plan for ongoing site operations and maintenance, while also staying agile to adapt in this dynamic and rapidly evolving market.



## Leverage lessons learned from experienced players from the beginning

The road to electrification can seem long, but it needn't be daunting. Engaging key stakeholders with experience upfront can significantly simplify the journey. It's important to understand all of the key elements of the electrification process and the ecosystem of players, from vehicle providers, charging providers, and utility infrastructure, as well as government agencies and others providing incentives. Those who navigate this complex ecosystem and effectively coordinate the myriad stakeholders best will save significant time and cost.

There are many new and complex processes to navigate and choices to make throughout the fleet electrification journey. For example, utility interconnection studies and upgrades can take 6-18+ months, utilities may require easements, and there are a variety of utility tariffs to choose from, which could dramatically impact your electricity bill. Hardware mix should be carefully selected based on the fleet vehicle mix and duty cycles. Experienced players can leverage lessons learned to help navigate the electrification process.

Furthermore, it's important to understand the metrics and financial hurdles for your project(s) or program. Experienced players can help calculate detailed costs and benefits over the entire life of an electrification initiative. Many of the costs and savings can be nuanced and unexpected. Furthermore, it is possible to craft a fleet electrification plan to make it more financially attractive. Higher upfront vehicle costs can be reduced with grants or incentives. Financing can also help overcome upfront barriers, and flexible charging business models can reduce upfront costs. This detailed financial analysis can help get internal stakeholder support and executive buy-in.

### Keys to Success



#### **Pick an experienced and capable partner**

Leverage the experience of others



**Best Practice:** Communicate often, and build an electrification working group. Fleet electrification is often a large change that impacts a range of stakeholders within an organization from drivers to senior management. A working group can help facilitate buy-in from key stakeholders, while galvanizing the organization around the electrification goals.

## Build a “data-driven” fleet transition plan

In order to succeed, it's important to clearly define your goals and develop a data-driven, continuous-learning transition plan.

**Best Practice:** Perform a baseline evaluation that will help identify the initial pool of your fleet vehicles that are strong candidates for the first wave of electrification. This begins with data collection on your existing fleet (age, mileage, acquisition/fuel/maintenance costs, duty cycle, as well as other operational metrics). Next, develop a working model for electrification, electrify a viable portion of your fleet, and closely monitor actual results understanding variances and updating your working model accordingly to enable you to determine the next phase of transition.

Use a Total Cost of Ownership (TCO) framework to make data-driven decisions on when and how to electrify your fleet, including vehicles, the charging infrastructure and operations and maintenance of both. A TCO framework also offers fleets the ability to carefully examine different asset (vehicle and/or charging infrastructure) ownership options and how that fits into organizational objectives for CapEx and OpEx, financial payback time horizons, and hurdle rates.

### ► Incentives:

Fleets around the country are eligible for grants, rebates, and other incentives. Ask your charging solution provider to help you take advantage of these incentives to ease your transition. For instance, capturing Low Carbon Fuel Standard (LCFS) Program credits in California can significantly influence economics of fleet electrification.

### ► Site Selection & Planning:

Have you examined the electrical and physical constraints for each site? Are utility upgrades necessary? If so, create a plan to engage your utility. Also, compare utility rates at each site and see what rates may be available for EV charging.

### ► Future Proof:

Is your transition plan future proofed? Design your site layout and electrical infrastructure today to support your fleet's needs as it will grow, minimizing future construction and interconnection costs. Select a charger architecture that enables cost effective upgrading as well.

## Keys to Success



### Embrace Data

Quantify your goals and plans, and refine with results

## Take a holistic approach when designing your fleet electrification plan

In order to succeed, it's critical to think about the EV infrastructure **while** you select your EVs, **not after the fact**. Vehicle and charging infrastructure (hardware and software) are part of a larger ecosystem that requires holistic planning. Co-optimize EVs and EV infrastructure based on your fleet operational needs and target cost per VMT.

### Choosing your Charging Hardware:

- ▶ **Take a vehicle and charger agnostic approach.** Consider a full range of vehicle and charger solutions; think beyond a single OEM and single charging manufacturer to match the best charger to your fleet needs.
- ▶ **Select your charging infrastructure based on your fleet operational needs.**
- ▶ **Find the right balance of charger types** (L2s and DCFC) and power levels to ensure fleet uptime while reducing costs.
- ▶ **Future proof your site** to ensure that you can accommodate future growth of your fleet, new technologies, and more in this rapidly evolving ecosystem.

From deploying the first urban fast charging, to the first 150kW and 350kW chargers in the U.S., EVgo is a pioneer in advancing the deployment of fast charging infrastructure, including for fleets, to meet the needs of the future. For example, power sharing EVSE, designed for power delivery in excess of capabilities of even the next generation of EVs, ensures that stations can meet increasing kW demand while controlling costs. Modular, flexible architecture allows you to augment power, add connectors, and optimize capacity, when needed.

### Charging Software:

Smart, networked charging hardware that can be managed with software is essential. There are **several** foundational elements when selecting charging software:

- ▶ **Energy management:** Whether it be load sharing across chargers or load shifting to reduce demand charges and avoid unnecessary upgrades, energy management is a key aspect to consider.
- ▶ **Charging optimization:** Co-optimization of vehicle duty cycle, fleet uptime, and fuel costs for both scheduled operations and unplanned contingencies provide the lowest cost per VMT.
- ▶ **Interoperability:** Leveraging open-standards like OCPP will avoid vendor lock-in and make it easier to scale your fleet electrification efforts as technology evolves.
- ▶ **Telematics integration:** Charging software should be integrated with other technologies to monitor a variety of information related to a fleet of vehicles such as fleet management, fuel management, and fleet maintenance integration.

**Best Practice:** Co-optimize vehicle and charging infrastructure selections and take a vehicle and charger-agnostic approach. EVgo has carefully vetted a best-in-class hardware portfolio with a wide range of chargers to meet your specific needs. Employ open standards, and ensure the charging infrastructure is smart so you can manage energy use and integrate with core fleet management systems.

### Keys to Success



#### Take a Holistic Approach

Plan your infrastructure while selecting your EVs

## Prioritize infrastructure deployment expertise in partner selection

Often an underestimated step in the electrification process, fleet managers can benefit from having charging solution providers manage the complexity of charging infrastructure deployment.

### ► Site Selection:

If new sites are needed, then thoughtful site selection will help minimize project costs and timelines.

### ► Site Assessment:

While equipment costs may be known, installation costs can vary wildly. Ask your charger vendor to perform a site assessment and help you develop an installation plan. They can also help you understand whether additional power service upgrades are needed.

### ► Utility Coordination, Engineering, and Design:

Ask your charging service provider to help with utility engagement as early as possible in the design and permitting process, especially if distribution grid upgrades are needed.

**Best Practice:** Future-proof your site design by considering growth over at least 5-10 years. Design your electrical infrastructure today to support your fleet's needs tomorrow. As part of this, consider the value of "hub and spoke" charging to supplement depot charging needs – that is, using a combination of depot charging, public charging, and dedicated charging located off-site. Additionally, "depot roaming" may be valuable to some fleets, where depots allow guest fleet access at times of availability to enhance the overall economics.

### Keys to Success



#### Future-Proof Your Site

Deploy your infrastructure by considering growth over 5 to 10 years

## Have a plan for ongoing site operations and maintenance

Be sure to procure a maintenance package from your vendor to ensure ongoing monitoring and repair of equipment. A partner that sells you equipment and walks away isn't a good partner.

### ► Proactive Monitoring:

This will ensure problems are discovered before drivers and operations are impacted.

### ► Uptime Guarantee and SLAs:

To ensure smooth fleet operations ask your charging solution provider for an uptime guarantee and service-level agreements (SLAs).

### ► 24/7 Customer Support:

Select a charger vendor who offers 24/7 Customer Support and Service to help ensure fleet uptime.

**Best Practice:** Select a charger vendor that puts reliability and uptime at the forefront by offering ongoing operations and maintenance services. EVgo has industry leading uptime at >98% and can support you in achieving the same.

### Keys to Success



#### Reliability and Uptime

Select a vendor that offers ongoing operations and maintenance services

## Learn and Adapt

- ▶ Your second-generation deployment should leverage lessons from your first buy and take advantage of continued technological improvements over time.
- ▶ We recommend fleets take a modular or phased approach to deployment to allow for the ability to learn and adapt.
- ▶ It is important to take time to periodically review and update your fleet electrification goals as your efforts scale and mature.

**Best Practice:** Take a modular approach to fleet electrification that allows for continuous improvements and the ability to learn and adapt.

### Keys to Success



#### Take a Modular Approach

Leverage lessons learned along the way



# Looking to learn more about electrifying your fleet with EVgo?

EVgo is here to make electrification simple. We leverage our experience and expertise on the customer's behalf. Our proven track record prioritizes reliability and uptime, because we know your mission-critical business operations depend on a reliable fleet.

Contact us via email: [fleets@EVgo.com](mailto:fleets@EVgo.com) or via phone: **877-494-3833**

