US fleets want to go electric
Here’s how they can do it
Electric vehicles (EVs) are on their way to becoming mainstreamed with government, consumer and corporate buy-in hitting a fever pitch. And, as battery costs fall, EVs are steadily becoming more economical, almost certainly spurring accelerated adoption. Much of the discourse and excitement surrounding the electrification of transportation has focused on private passenger cars — for good reason given the positive environmental and societal changes the transition to battery power could bring. However, a big part of the pivot to electric will also be experienced by public and private fleets.
US fleets want to go electric

Fleets primed to go electric … with lighter, last-mile-delivery trucks to lead the pack: As governments and companies alike adopt greenhouse gas (GHG) emissions reduction targets, replacing entire fleets with battery-powered vehicles is on the table. To put the importance of this transition into perspective, consider that 28% of US GHG emissions (in 2018) were generated by the transportation sector and, of that amount, well over half (59%) was produced by heavy-duty vehicles and another 23% by light- and medium-duty trucks, according to the Environmental Protection Agency (EPA).

The nation’s ground transportation fleets number roughly eight million, and companies in a range of sectors — from utilities to e-commerce to food-and-beverage — are eyeing plans to go electric. Of course, some segments of this fleet will likely experience faster adoption than others over the next decade. Based on a PwC analysis, we believe light trucks and vehicles used for last-mile delivery will reach total cost of ownership (TCO) parity with their internal combustion engine (ICE) counterparts sooner (within the next several years) than medium- and heavy-duty trucks.

2018 U.S. GHG Emissions by sector

2018 U.S. transportation sector GHG emissions by source
EV fleets to drive ESG agendas: Cleaner fleets will, undoubtedly, be a carrot for many companies looking to carry out their larger Environmental, Social, and Governance (ESG) agenda. For example, they will look at greening their fleets as a way to lower their carbon emissions in their own operations and for their customers. Such efforts can help to achieve ambitious carbon reduction targets that are increasingly expected by stakeholders, including investors. We expect tightening emissions regulations for commercial vehicles to play a role in fleet replacements. The Environmental Protection Agency (EPA)/National Highway Traffic Safety Administration (NHTSA), for instance, aims to employ new stringent emission and fuel-efficiency standards for medium- and heavy-duty commercial vehicles not currently regulated by Corporate Average Fuel Economy (CAFE) standards. States, too, are advancing emissions restrictions.

The government’s big EV push: Several Biden administration proposals seek to accelerate the transition to an electric fleet. A proposed $174 billion package of incentives and grants aimed at supporting domestic production of electric vehicles (EVs) and the build-out of a network of 500,000 EV charging stations is on the table. Various other federal proposals promote all-electric transport, including plans for the Department of Energy to support a domestic lithium battery supply chain. While these and other proposals are yet to be passed, they nevertheless collectively signal the administration’s endorsement of an EV future.
Building electric fleets: Five core considerations

Despite the wellspring of capital investment and the acceleration of commitments, getting the US transportation sector to net zero GHG emissions will hardly be an easy task. Still, the underlying economics of EV ownership are improving and, at the same time, economic incentives and parallel-track regulations are sending strong signals that EV penetration will likely increase steadily over the next decade — and perhaps beyond current estimates.

Companies that are intent on replacing their ICE fleets with EVs should begin carving out plans now. Here are five considerations regardless of the size of your fleet.

1. Know your EV fleet economics

Total cost of ownership (TCO) of all EVs has been falling over the years, but as pressure grows to transition, fleet owners should prepare to look more closely into factors driving costs, especially if purchasing in the hundreds or thousands of units (compared to ICE vehicles for the same use case). A thorough, no-surprises analysis of the TCO of a given electric car or truck should include these core EV fleet TCO considerations:

**Battery cost**: Battery cost is a substantial component of TCO and includes total costs driven by pack and cell costs. Battery costs, however, have gone down considerably over the years, from an estimated $650 in 2010 (pack and cell combined) to about $160 to $150 today, according to a PwC analysis. Costs are estimated to decline further to about $100 to $120 by 2025. Battery costs are generally more expensive the heavier the vehicle.

**Battery depreciation**: Usual life (and residual) battery value is another major part of TCO, with batteries losing efficiency over time. Recent technological advances, however, are extending battery lives (and cutting depreciation costs), yet it’s uncertain to what extent battery lives could be extended in the coming years and what “second life” applications are feasible. This remains a significant unknown.

What to consider when building electric fleets

- EV fleet economics
- Workforce needs
- Align strategy with EV rollouts
- Track government incentives
- Charging infrastructure
Miles driven/utilization drives TCO in near term: TCO of any EV is dependent on use, and naturally can vary widely in different use cases such as long-haul versus last-mile delivery. In general, the higher the miles driven the more attractive the TCO (and a quicker path to parity with a like ICE-vehicle). There are exceptions, and we believe that vehicles used for light transportation and last-mile delivery will be the first commercial EVs to reach TCO parity with their ICE counterparts. We expect that through the next decade conditions will increasingly create TCO parity with ICE vehicles of other heavier and larger commercial EVs such as long-haul, regional delivery and construction vehicles. The extent of the lowering of TCO — and, hence, increased adoption of — medium- and heavy-duty EV trucks will likely be driven by factors like the availability of charging for long-haul use cases, battery weight reduction, battery range and efficiency, and battery cost reduction.

Lighter trucks to reach TCO parity with ICE vehicles sooner than heavier trucks

TCO Analysis
NA ICE/BEV TCO without incentives ($k, 2020)

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TCO costs include: Net vehicle, net battery, sales tax, operating cost, charging infrastructure

Key Assumptions: Battery Pack Cost ($/kWh): 2020 $150, 2025: ~$120, 2030: ~$110; Electricity Cost ($/kWh): Commercial L2: ~$0.16, DC Fast Charging: ~$0.41; Diesel Cost: ~$ 2.74 / gall; Battery Size & Assumed Range: LD - 100 kWh, 180 miles, MD - 160 kWh, ~140 miles, HD - 440 kWh, 230 miles, Sales tax: 8%; Discount Rate: 5%; Powertrain characteristics and costs (both ICE & EV) vary by vehicle class; Assumes annual fuel efficiency improvement cost for ICE vehicles; Charger installation cost ~$4,000; Average annual miles driver per day & in-service days: LD: 120 miles/day, 345 service days; MD: 200 miles/day, 345 service days; HD: 430 miles per day, 300 service days
Charging strategy: How, when, and where EVs recharge is a major operating cost driver, with fleet-charging optimization playing a major role in cutting operating expenses and CAPEX of charging infrastructure. Fleet managers will need to consider variables, such as type and volume of chargers, cost of electricity and fleet charging management. They’ll also have to consider whether it makes sense to build out their own in-hub private charging infrastructure, which could be less costly over time than public charging. Building a private charging network can be a big decision, requiring a careful consideration of how many chargers are actually needed and how fast they need to be, which can affect costs greatly. The type of charger also needs to be considered: the plug-in charger, the most prevalent currently in the market; the overhead charger, designed for medium- and heavy-duty commercial trucks; and the wireless charger, a nascent technology with little market penetration thus far.
Maintenance and repair: With far fewer moving parts than their ICE cousins, EVs will likely involve lower repair and maintenance costs during their lifetime. For instance, EVs will not require things like oil changes, transmission service or spark plug replacement. Further, belts and brake maintenance is expected to be reduced due to EVs’ regenerative braking. Other electronic components (battery, motor) are expected to require minimal maintenance. It’s important to compare your baseline repair and maintenance for your existing ICE and compare that to scenarios that will help you forecast possible costs for an EV fleet. Some estimates suggest that maintenance cost for EVs will be 30% to 40% lower.

2. Align your EV strategy with OEMs’ rollout plans as options widen

In the last few years, OEMs have accelerated announcements of new nameplates of EVs, particularly passenger cars. While there have been EV launches of light- medium- and heavy-duty trucks in classes 1 through 8, options for electric-powered medium- and heavy-duty trucks continue to be relatively limited, though the number is expected to grow over the next several years. As for last-mile-delivery vehicles, there are quite a few options available already with many new players entering this space.

The proliferation of so many EV options could leave some companies unsure which new models suit their specific needs. Getting familiar with the economics, charging needs and other characteristics is crucial. There’s a lot to consider. Some businesses may be wondering if they should wait for the total cost of purchase to go down as with other technologies that go mainstream. Quite simply, when’s the right time for adoption? Clearly, there’s no one answer for all companies. Needs and urgency to go electric can differ from company to company — and even from sector to sector. In any case, knowing what’s coming down the pike in the market is crucial to answering these questions.
3. Assess your charging infrastructure and management needs

Selecting charging infrastructure can be complex and based on a wide array of variables. Fleet managers will need to get an accurate idea of vehicle usage patterns before deciding on charger technology. And it doesn’t stop with the chargers. There’s also charging management software that could be required to manage energy loading and demand. Typically, fleets will need to be charged overnight over a multi-hour period, so ensuring that it’s feasible is the first step in considering private, in-hub charging. Another big question is whether less expensive Level 2 chargers will suffice or if Level 3 or Level 4 chargers are required — and how many. A PwC analysis estimates that the initial capital investment per charging station by level is:

- **Level 2** (5-6 hours charging time): $2,000-$5,000
- **Level 3** (30 minutes): over $75,000
- **Level 4** (20 minutes): over $125,000

Other considerations include determining the types (e.g., plug-in, overhead or wireless) and brand of chargers that best suit your needs. Also, depending on the operational hours for the fleet, companies should also consider a strategy to optimize charging at off-peak hours when possible or make sure electricity is available during peak hours.

4. Track incentives available to your business

It’s important, before any vehicle (or charger) is purchased, to evaluate how your company may qualify for governmental (federal, state and municipal) benefits (tax credits, rebates) for EV and EV-charging infrastructure adoption in the territories where you do business. All-electric and plug-in hybrid vehicles, for example, may be eligible for federal income tax credits of up to $7,500. Also, the IRS Alternative Fuel Infrastructure Tax Credit provides a tax credit of 30% of the cost of commercial EV chargers, not to exceed $30,000. Additional state and local incentives may also be available, meaning you’ll need to navigate a patchwork of current incentives across the country and track new ones. You’ll also need to know the profile of emissions reduction that qualify for benefits (based on vehicle type and timeline of adoption).

5. Assess what new workforce expertise and training you’ll need

Electric vehicles maintenance requires a host of specialized skills, including maintenance and repair, software management and energy management. Companies will need to ensure they have the talent within their ranks to run the fleet, which will in many ways differ greatly from how it’s been done for decades. Is there a need for upskilling or hiring new talent? What new strategies need to be developed to maintain and operate an EV fleet and infrastructure? Does your company plan to do the work in-house or take on a third-party specialist?
Choosing the path that’s right for you

With a confluence of factors accelerating its development, electrification of transportation will probably become mainstream faster than any of us thought just a few years ago. Most businesses with fleets are already asking themselves how their organization fits into this future. In a nutshell, most all companies are considering twin goals: taking action to avoid the worst impacts of climate change, while making sound economic decisions for their business. A solid EV fleet strategy achieves both these aims.
To have deeper conversations about how this subject may affect your business, please contact:

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