Everything You Need to Know

About Medium & Heavy-Duty Fleet Electrification

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Fleet electrification isn't new to the industry, but larger deployments and the arrival of new medium- and heavy-duty electric vehicles are increasing project complexity. Even fleets with significant EV experience must reassess their approach to account for the increased complexity.

According to Bloomberg Electric Vehicle Outlook 2021, on the road today there are:

12M passenger EVs

1M commercial EVs

600K e-buses

Planning for medium- and heavy-duty EVs

For many light-duty pilot programs, fleets were able to avoid large facility and utility service upgrades because of the smallness of their projects and the use of clever load management software. Charging needs today are too large, and significant infrastructure investments are inevitable. Costs are larger, schedules have a greater number of dependencies and initial errors are much harder to undo or retrofit

Assemble the right project stakeholders

EV fleet projects require collaboration across departments and with outside organizations. Internal representatives from the fleet, facilities, and property management teams should all be involved. It is also vital that the fleet organization communicates with the utility, which will certainly need to provide electrical upgrades, and electric vehicle charging software and hardware providers. Vendors, if engaged with at an early stage, can flag additional site and hardware concerns.

Did you know?

In several use cases, battery electric trucks of any size are the cheapest option in the 2020s? This is due to declining battery costs, moderate driving ranges, and efficiency penalties of diesel trucks in urban traffic.

Source: Bloomberg Electric Vehicle Outlook 2021

Build an attainable project schedule

One of the main advantages to engaging with partners early is that it helps to develop a realistic and achievable project schedule. Engaging with all of the entities involved in an EV fleet project arms fleets key information when it matters most- duration estimates and guidance on appropriate float and buffer. This applies not just for ordering charging hardware and vehicles, but other important project tasks such as permitting plan check, utility service upgrades, and integrations with enterprise software. For heavy-duty vehicle projects deployment and commissioning can take up to 14 months or longer in some cases.

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Choose the right electric vehicle chargers and site design

Studies show that EV chargers have a useful life of ten or more years, but, in some cases, it is likely longer. Where this is the opportunity or choice to install faster speed chargers, fleets should generally do so even if the existing circuit is not sufficient for the charger's full output. Load management software can throttle the charger back until planned or expected electrical upgrades are completed.

Future proofing projects can also mean a modular approach where the site design assumes upgrades in the future such as new chargers or upgraded electrical service. Some fleets see Megawatt Charging for example as a key part of their future EV fleet operations. Although those chargers are not commercially available yet fleets can prepare for them with make-ready actions.

Thinking outside of the traditional site design may help fleets prepare for the future as well. While concrete equipment pads are common for site designs, more fleets are moving towards suspended flooring. Suspending flooring is typically a metal grate supported by concrete infrastructure underneath the grating. This allows fleets to easily upgrade, route, or re-route the cables connected to the charging infrastructure.

Important questions to ask when evaluating EV chargers:

- Do the chargers integrate with other enterprise systems?
- Is the technology state-of-the-art?
- Are the load management capabilities right for your fleet operations?

Gather operator feedback

After an electrification project begins, it is important to regularly assess operations, including driver feedback, budgeted versus actual charging costs, and other service metrics. An integrated electric vehicle charging solution helps fleet organizations collect and analyze EV and charging data so the best decisions for the fleet can be made quickly and easily.

Driver training for EV pilot programs: Although EVs are easier in many ways to operate than gas or diesel vehicles, training should be provided. Experienced staff with demonstrated good driver behavior are good candidates for being the first assigned to EVs. They can more effectively model good EV driving behavior and provide detailed feedback to managers in order to improve future drivers' experience.

Helpful tip: Start early to end on time!

With increased power levels, permitting becomes more complex. Fleets should check with their utility early to determine permitting, certification, documentation, and specification requirements.

EV charging and cybersecurity

With ransomware attacks on fuel supplies making headlines, some people assume EV charging is a safe solution; however, security and cybersecurity will not be solved through EV adoption. EV charging networks are not immune or more resilient to these kinds of cyberattacks. All connected devices and networked systems carry risk, and although that risk can be identified and managed with EV charging — it is still there. Fleets that rely on a single EV charging network are opening their fueling operations to security risks.

The first step to any resiliency plan is addressing single points of failure. A single point of failure is a part of a system that, if it fails, will stop the entire system from working. Single points of failure are undesirable and can be managed by creating redundancies that ensure continuity of operations in the event of a shut down.

For EV fleets, the most significant point of failure is the EV charging network because a disruption would be enterprise-wide and not limited to a single parking location, type of vehicle, or charging hardware. A cyberattack on an electric vehicle charging network would "brick" chargers across all of a fleet's facilities, because it is the network software that grants drivers permission to charge and initiates charging sessions. Fortunately, there are few solutions to minimize the impact of a network outage.

Solution 1: Deploy two or more networks at each fleet location.

The odds of two or more networks being hacked at the same time are low. Most EV charging networks use different servers and software, and their networks are separate from each other. Although a cyberattack on one network would still reduce a fleet's total number of chargers in service, only a fraction of the total fleet chargers would be affected.

Solution 2: Switch Network Management.

In the event of a cyberattack, fleet managers can change networks or enable a local controller. Enabling a local controller (if already installed and setup), is one way to bypass the down network and continue managed charging. The other option is to replace the SIM cards for each charger with another network or the charger's original software. Similar to mobile phones and other devices, the charger's network software is on a SIM card inside the device . By removing the SIM card and replacing it with the manufacturer's original SIM card, charging can continue. Both of these options will require a trained technician and prior planning.
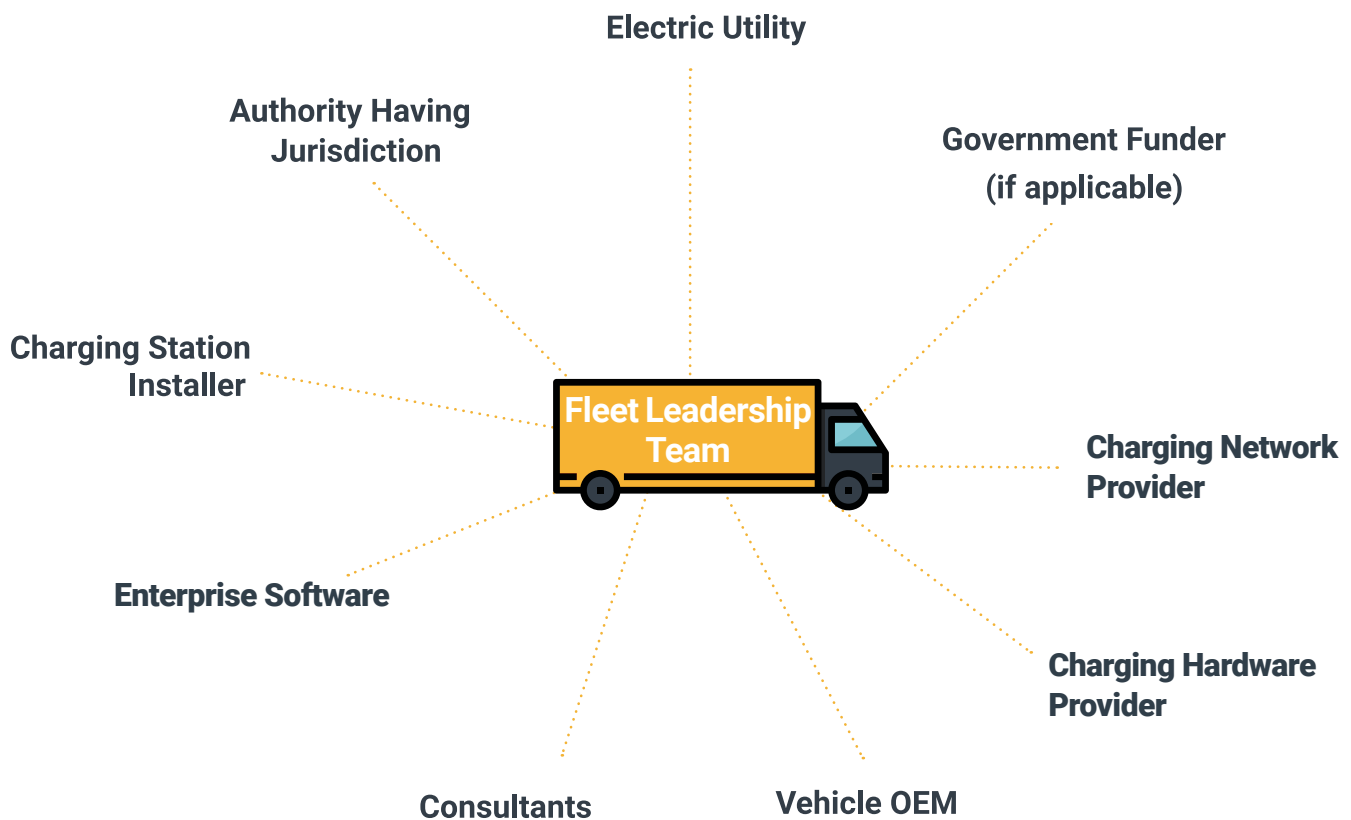
Solution 3: Utilize Fuel Island Controllers.

Fuel Island Controllers, like the kind used for gasoline and diesel, can also be used for EV charging. Island Controllers are a rugged and proven fleet technology. They are incredibly resilient tonetwork outages as well. Every day, their firmware is updated with a list of approved fleet users so that even if internet or cellular connections are lost, fueling can continue. The island controller simply refers to its most recentlyupdated authorized users list and continues to charge vehicles accordingly.

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Conclusion

For the fleet management industry, innovation is constant and technology advancement requires fleet teams to continually adapt. From the first inventory management bar code scanners in the 1980s to today's use of fleet management mobile apps, fleet electrification is part of a larger industry trend.

For over 40 years, AssetWorks has provided the fleet management industry with advanced software solutions, including integrated fleet and fuel management software, motor pool management software, mobile applications, and electric vehicle charging operations. In close partnership with customers, AssetWorks can provide insight and support to develop the right electric fleet charging program.

For a successful EV project, fleet leaders must interact with a variety of groups, including:

Electric Utility

Authority Having Jurisdiction

Government Funder (if applicable)

Charging Station Installer

Fleet Leadership Team

Charging Network Provider

Enterprise Software

Charging Hardware Provider

Consultants

Vehicle OEM

To learn more about fleet electrification for light, medium, or heavy-duty vehicles, contact the AssetWorks team today at assetworks.com/fleet/fuelfocusev.

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