

# Five things to plan before beginning electric fleet conversion



**Fleet owners across the country are making the transition to battery electric vehicles (BEVs). Recognizing BEVs are more cost-effective and environmentally friendly than fossil-fueled vehicles, owners are realizing the benefits by replacing everything from trucks to light-duty vehicles.**

BEV adoption is projected to rapidly increase over the next 10 to 20 years based on anticipated regulatory changes; pricing similar to internal combustion engines; improvements in battery range; enhanced vehicle performance; and the increased availability of electric charging infrastructure. Based on our experiences helping fleet managers make the transition, thorough upfront planning in five key areas will bolster electric fleet conversion success.

## **01. Grid capacity and charging equipment**

Plan for utility-side upgrades at fleet charging locations as early as possible. It can take many months to negotiate, plan, implement and agree on cost-sharing arrangements with the utility. Consult with the local electric utility and

electrical engineers to ensure that all power requirements can be met. Sharing projected electric load growth based on BEV implementation plans with the utility will allow for synchronized upgrades.

In addition, consider standardizing electric vehicle service equipment across all facilities to minimize maintenance costs and implementation obstacles. Standardization will provide flexibility to accommodate BEVs manufactured by different original equipment manufacturers, which will support competitive procurement. Standardization also includes adopting an IT system that can operate on existing fleet vehicles and BEVs, so that your organization does not have to manage two systems at once.

## **02. Vehicle and battery size**

When selecting the vehicle and battery size for a fleet, prioritize specific operating needs. Consider the required vehicle range per day (which typically depends on the routes traveled), fluctuation in miles traveled, opportunities for charging en route and charging station availability in the selection process.

For replacing vehicles that typically travel less than 100 miles per day, a BEV will be most suitable. For vehicles that need to travel longer distances, or emergency vehicles that require immediate or prolonged availability, a BEV with a larger battery, a hydrogen vehicle, or a hybrid may be a better choice. When selecting a battery size, consider factors that can decrease the battery range, such as operating during cold weather, extreme heat or very hilly routes.



### **03. Implementation and operation planning**

Conduct a full planning study of the entire fleet before any implementation begins. For large fleet owners, a multi-phased approach is recommended to minimize risks and disruptions to operations.

The first phase should include electrifying vehicles that will cause the least disruption to current operations, namely vehicles that travel short distances and for limited durations. This allows operators to gather information on vehicle performance, including battery capacity, charge times, maintenance needs and other logistics, which can be used in future phases.

Next, evaluate the current operations model so that you can quantify what an average travel day looks like as well as the maximum potential distance a fleet vehicle might have to travel. The specific distances traveled by each fleet vehicle in a day can be used in modeling future BEV fleet charging scenarios and help identify charging durations and locations.

Once a charging scheme is determined, your organization can plan operational changes to accommodate charging, allowing for a seamless transition when the BEVs are incorporated into the fleet.

### **04. Phased installation and fleet implementation**

Take a staggered approach to implementing BEVs. Fleet owners across the United States have started their fleet conversions with operational testing at low levels of implementation. As the implementation process moves along, there is the opportunity to allow charging and battery technology to develop further and better accommodate the vehicles that travel longer distances or support more variable operations. However, regulations and emissions reduction target dates are quickly approaching.

Gasoline-powered cars for purchase will be phased out in California by 2035; and diesel trucks will be banned in Washington, DC, and 15 states including Massachusetts, New Jersey, New York, North Carolina and Washington by 2045. Preparing a phased implementation now will ensure your organization is prepared to meet these mandates.



## 05. Electric load management

Effective energy management is the key to keeping utility costs down. Tools like charge-monitoring software can help you ensure that all vehicles are charged while managing the electric loads and avoiding peak demand charges. In addition, effective energy management may reduce the amount of infrastructure needed and lower upfront investment costs. If possible, install charging stations where the vehicles are stored when not in use. If vehicles require charging during operations, fast-charging locations should be evaluated in locations that are central to fleet operations. Land acquisition and electricity availability will be key in determining these locations. For charging that occurs overnight and at vehicle storage locations, confirm power availability by coordinating with the utility. That way, both organizations can assess the current capacity and plan the required electric upgrades.

Making the transition to BEVs can be challenging; BEVs require longer refueling times, operational changes, and modifications to driver behavior compared to diesel vehicles. Start with these five key planning areas to put your organization on the road to a successful fleet conversion.

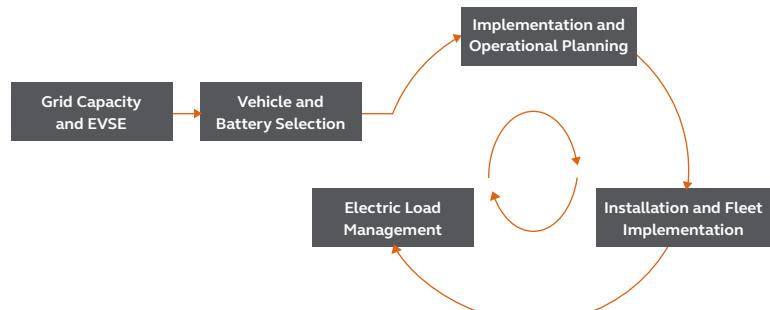


Figure - Five key areas to focus on for BEV implementation. Once initial pilot implementation begins, electric load management, further implementation and operational planning, and installation will continue to occur cyclically until full implementation is achieved.

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