

City Guide to Electric Vehicle Readiness (Ford Motor Company Perspective)

Abstract

As the number of electric vehicles (EVs) continues to grow in the market, it is important that cities develop actions plans that ensure these vehicles are viable solutions for their citizens. This document provides suggested steps that assist cities in developing a near term electric vehicle readiness plan for residential and public charging infrastructure with a relatively modest investment.

This whitepaper will examine:

- Proposed advisory committee participants;
- Steps for streamlining the Electric Vehicle Supply Equipment (EVSE) Installation/Permitting process;
- Time-of-use rate considerations;
- The consideration of incentives in the EVSE installation process.

Introduction

Ford is committed to doing our share to reduce the potential for environmental, economic and social harm from climate change¹. One of the ways that vehicle manufacturers are contributing to this direction is by offering electric vehicles in their vehicle line-up. Vehicles that are all electric use no gasoline and are powered entirely off of a high voltage battery. This requires that there be an interface from the vehicle to the electric power grid through an outlet or charging station. This required interface brings with it a number of challenges; one of which is ensuring that there are enough charge stations, or infrastructure, available to EV owners. Providing a robust infrastructure will be important for the broad consumer acceptance of electric vehicles.

The development of a robust infrastructure will be dependent on close cooperation between many key stakeholders. At present, Ford representatives are working with state and local level governments, public and private utilities, charging infrastructure manufacturers, clean cities coalitions, and a host of others, to ensure the smooth adoption of electric-powered vehicles. As the number of EVs continues to grow in the market, it is important that cities develop actions plans that ensure that infrastructure is available, thus making EVs a viable solution for their citizens. This document provides suggested actions that assist cities in developing a near term electric vehicle readiness plan for residential and public charging infrastructure with a relatively modest investment.

Advisory Committee

The first step is to establish an advisory committee. Establishment of an advisory committee and active participation is a primary contributor to EV readiness success. Key participants should include government agencies (i.e., city, regional, state and federal), city planners, electric utilities, vehicle manufacturers and dealers, EV customers and local coalitions. The committee should be focused on developing a strategic action plan that outlines goals, responsibilities, deliverables and timing of all EV infrastructure related tasks. These tasks may include urban planning of charging locations for maximum customer usage, selecting and placing charge station signage, and establishing policy for parking permits and enforcement.

Electric Vehicle Supply Equipment (EVSE) Installation / Permitting

Secondly, cities can introduce streamlined permitting and inspection to support residential and public EV infrastructure installation by utilizing processes such as online permitting and selective inspections. With these improvements, the entire assessment, permitting, installation and inspection process can take as little as two days to complete for a home-based EVSE installation project.

Below is a brief list of considerations for both residential and public charge station installations.

Residential

- There should be a minimum 100A electrical service to accommodate the 40A charging circuit.
- A separate 120V circuit to troubleshoot and identify a charger or vehicle issue should be utilized.
- The charger should be installed so that it can be easily removed should the homeowner move.

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Public

- Determine the optimal placement of charge station locations and type that match customer behavior. For example it may be best to place a Level 2 AC charge station at a retail center or at an office building, and it may be best to place a DC fast charge station at a convenience store or gas station.
- Charge station locations should be communicated to charge station aggregators (e.g., NREL GeoEVSE, Google, etc.). Information to communicate includes cloud connection details, payment type, connector type (i.e., AC Level 1 or 2, or DC Fast Charge), cost to use, and the ability to check availability and make reservations.
- There must be a minimum 40A circuit (80A is optimal) available.
- There must be an understanding of regulatory restrictions that apply to a non-utility selling retail electricity.

Time of Use Rates

Electric vehicles introduce additional load on the power grid. Many major utility companies are looking for ways to mitigate the load during peak electricity usage times (usually between 3PM and 6PM weekdays) by offering off-peak time-of-use (TOU) rates to EV customers. Off-peak TOU rates are normally applied at night or during early morning hours (i.e., 11 PM – 5AM), and provide EV owners with discounted rates. The key for local utilities is to offer incentives so EV customers are encouraged to charge during the nighttime hours when capacity is more available.

As a next step, municipalities can help utilities with power management by promoting off-peak charging. This can be accomplished by educating the public about electric vehicles and the process and benefits of charging at home during off-peak hours.

Incentives

Some government agencies have chosen to support the introduction of EVs into the community. These agencies offer incentives for charge station installation. As a final step, cities can promote the use of EVs by using local or state infrastructure incentive programs to offset a portion of customer costs for EV charging hardware and/or installation. Other types of incentive programs that have been implemented in various states include purchase vouchers, rebates, and High Occupancy Vehicle (HOV) lane exemptions.

Benefits to Ford and Ford Customers

Electrification is an important piece of Ford's overall product sustainability strategy. Ford's aggressive strategy includes the launch of five electrified vehicles in North America by 2012 and Europe by 2013. Ford launched the Transit Connect Electric small commercial van in 2010, will launch Focus Electric later this year and will introduce C-MAX Hybrid, a second next-generation lithium-ion battery hybrid and C-MAX Energi plug-in hybrid in 2012. The range of electrified vehicles allows Ford to meet a variety of consumer driving needs. Charging infrastructure is a key enabler to electric vehicles – regardless of where consumers end up charging their vehicles.

Summary

The catalyst for collaboration between Ford and local municipalities is our common vision of the adoption of electric vehicles and ensuring the necessary infrastructure is in place for their integration into the community. Implementing an advisory council is the first step toward enabling this smooth integration. Other actions that should be considered include streamlining the EVSE installation and permitting process, working with utilities and educating consumers on time of use rates, and considering incentives for potential EV owners.

References

1. "Blueprint for Sustainability: Driving Change" by Ford Motor Company. <http://corporate.ford.com/our-company/sustainability>

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