

Electrifying the Transportation Sector in New Jersey



2 OVERVIEW

Findings & Recommendations

- I. High Installation & Operating Costs are a major barrier to electrification of the transportation sector.
- II. Charging Locations & Infrastructure are pivotal to further deployment of electric vehicles.
- III. The Electric Vehicle market is rapidly evolving and incentive structures need to be adaptable and agile.



3 OVERVIEW

Outreach & Education

- I. The primary pieces of information that need to be communicated in order to encourage EV adoption are: factors that influence behavior shifts (from gas-powered vehicles to electric vehicles) and the basic technology behind electric cars.
- II. Opportunities to test drive vehicles have been proven, nationwide, to be an effective lever to increase electric vehicle adoption among fleet operators.
- III. EV use as part of an overall Corporate Social Responsibility strategy may be a powerful tool to activate the private sector toward EV adoption.



4 FINDINGS

HIGH COSTS

High operating expenditure of DC Fast Chargers (DCFCs) is a barrier to entry in the electric vehicle infrastructure space.

A significant portion of these costs are the connection to power source and peak charging costs.

Recommendation: Partner with utilities to facilitate DCFC network expansion:

- 1) a utility incentive structure that pays for the make-ready infrastructure and some or all operational cost.
- 2) the designing of specific rate tariffs for energy use in order to stabilize charging costs for operators.

Background:

Direct Current Fast Charging infrastructure is costly from the utility side of the meter and should have utility intervention to keep costs low and propel growth of network. Sub issues affecting further development of the DCFC market are:

- Demand charges - portion of the electric operating costs for developers/owners tied to the highest average demand during a specific period in the utility cycle, typically 15-minute intervals. Utilities must deliver electricity to meet a customer's peak demand maintaining reliability of the grid, therefore, they charge higher rates to encourage users to reduce demand.
- Make Ready - installation costs of the electricity supply infrastructure to DC Fast Chargers, not just EV Supply Equipment (EVSE). This can include both utility and customer-side of the meter.

Example of recommendation in action: PG&E in California sponsors program for the installation of 7,500 Level 2 chargers within 3-year period. Chargers must meet program location requirements. However, the utility does not own the chargers.



5 FINDINGS

HIGH COSTS

Most states with electric vehicle incentive programs provide rebates to encourage investment in electric vehicle infrastructure.

Recommendation: Provide a rebate of up to \$80,000 or 80% of project costs to cover new, stub-out, replacement or make-ready sites and equipment costs for DCFCs.

Furthermore, create a user-friendly online application process.

Background:

To incentivize public and private actors to invest money in EV infrastructure, specifically DC Fast Chargers, New Jersey should introduce a rebate program to help reduce the installation cost of such fast charging stations for companies that elect to install them.

With current budget of \$100,000 per charger, California and Massachusetts provide upfront rebates. California has been very effective with their program as they grant \$80,000 or 80% of total project costs (whichever is less) for make-ready and installation of the chargers. Massachusetts provides a \$50,000 per charger rebate on chargers installed in both public and private spaces. Rebates are considered easy to implement and less bureaucratic than tax credits.

Amounts above include buffer for warranty and equipment failure.



6 FINDINGS

HIGH COSTS

New York has chosen to provide tax credits as their preliminary research has led them to believe that the private sector and private actors are more incentivized by tax credits than by rebate programs.

Recommendation: Offer a tiered tax credit system for the installation of DC Fast Chargers on commercial properties. This serves as a way to target companies of all sizes with a vehicle fleet.

Background:

New York has chosen to provide tax credits as their research has shown private sector responds better to tax credits, rather than rebates. An EV charger tax credit would target businesses such as UPS and Walmart to purchase electric fleets and install charging stations on business property as well as promote the use of electric vehicles. New Jersey would fund this growth by providing these businesses tax credits to those entities domiciled or doing business in the state who invest in EV charging infrastructure on commercial properties opened to public access. The credit would only be available if the charging infrastructure is installed on a property located in New Jersey.

Example:

- Companies with turnover >\$50m 30%
- Companies with turnover <\$50m 50%



7 FINDINGS

CHARGING STATION LOCATIONS

New Jersey residents, like many other state residents, suffer from range anxiety when traveling long distances.

Recommendation: Install DC Fast Chargers along the Garden State Parkway (between Newark and Cape May) and on Interstate 78, from Newark to Easton, so that DCFCs are located at a maximum of 50 miles apart.

Background:

As range anxiety is a top concern, NJDEP should offer grants up to \$80,000 (80% x \$100,000 DCFC cost per NJDEP estimates) to cover equipment costs along the Garden State Parkway. Interstate-95 is currently well serviced with DCFC and Tesla superchargers. However, in areas east and west of I-95, there are few DCFC options. We selected the Garden State Parkway and I-78 to correct the current lack of supply.

Monitoring and evaluation of the sites should cover: usage, maintenance requirements and issues, performance, and budget overruns per stations within close proximity to Interstate 95.

Please refer to the following page for a list of recommendations.



8 FINDINGS

LOCATION RECOMMENDATIONS



Garden State Parkway

Exxon gas station - Lindburgh Rd, Newark Airport
 Lukoil gas station - Spring St, Elizabeth (4 miles from Exxon)
 Eagle gas station - Tinton Ave, Tinton Falls (36 miles from Lukoil)
 BP gas station - Dover Rd, Toms River (30 miles from Eagle)
 Sunoco gas station - Tilton Rd Egg Harbor Township (41 miles from BP)
 Shell gas station - NJ-109, Cape May (37 miles from Sunoco)

Interstate 78

Exxon gas station - Lindburgh Rd, Newark Airport
 Sunoco gas station - Vauxhall Rd, Union (8 miles from Exxon)
 McDonald's - Center St, Clinton (35 miles from Sunoco)



9 FINDINGS

CHARGING STATION LOCATIONS

California used a number of factors, including pollution levels, to identify individual municipality needs and disadvantaged areas.

Recommendation: Use the American Lung Association's metrics to help determine which counties have the worst air quality and increase rebate levels in those areas to address environmental injustice issues.

Background:

The American Lung Association's 20th anniversary of the "State of the Air" report has shown degradation of air quality as a serious concern nationwide. NJ counties receiving an F grade on air quality were numerous, including Bergen, Camden, Gloucester, Hudson, Hunterdon, Middlesex to name a few.

Furthermore, the New York-Newark area is ranked among the 10 most polluted regions in the United States. Finally, the ALA has estimated 33% of NJ's population is at health risk due to poor air quality. By using this metric, the state can target ideal locales for both GHG emissions reduction and DCFC expansion.



10 FINDINGS

CHARGING STATION LOCATIONS

Investments in DCFCs provide a higher return on capital when located in public, highly-frequented areas.

Recommendation: Install DCFC's in highly frequented areas that are well lit and have 24/7 public access. Focus on highly-trafficked areas. Examples include rest stops, multi-use commercial spaces and shared office buildings.

Background:

Charging stations are most profitable when located in highly trafficked areas where they can get the most use. This allows them to avoid “ramp-up” charges, create economies of scale, and provide the best return on investment for operators.

Publicly available chargers also maximizes this program as a truly public benefit. Moreover, exposure to EV technology and related government incentives will increase public awareness of the benefits of switching to an EV. Charging stations that are available 24/7 enhance the public perception of EV - its safety and reliability, especially when they are safe to access even at night or in desolate areas.



11 FINDINGS

ELECTRIC VEHICLE MARKET

Electric vehicle technology is advancing rapidly. Industry standards, as well as consumer needs and taste evolve at a fast pace.

Recommendation: New Jersey needs to structure its incentive framework, communication channels and infrastructure to be agile. Any technological changes or new evaluation data need to be accommodated quickly to ensure system resiliency and viability.

Background:

Vehicle electrification is a rapidly evolving industry. Technology, consumer preferences and requirements for electric vehicle infrastructure are subject to constant change. For example, while smaller vehicles (e.g. Nissan Leaf) were once popular, consumer preferences have shifted toward larger SUVs that have different charging requirements.

Thus, the state must be prepared to adapt to changes in both consumer taste and technology. These incentive programs need to have some flexibility in order to minimize program redundancy, increase overall resilience of the program and encourage further electrification among consumers.



12 FINDINGS

ELECTRIC VEHICLE MARKET

States are continuing to learn and evolve from their experiences.

Recommendation: New Jersey should establish the goal of its incentive program: saturate the market or design a strategic network, specifically targeting areas in need.

Background:

There is debate among peer states about whether it makes sense to flood the market, set up a strategic network or pursue both paths. New Jersey must determine the goal for its incentive program and clearly define the outcomes it is trying to achieve.

For context, California has adopted both strategies. Depending upon the municipality, both have proven successful. The state must decide if its aim is to saturate the market or design a strategic network, specifically targeting areas in need. The latter is a more cost-conscious strategy. Lastly, timing is crucial. The state should increase visibility of fast chargers in public areas and major corridors first. This may trigger demand and enable a more flexible rebate program in the future.



13 OUTREACH

OUTREACH & EDUCATION

Background:

3 basic barriers to fleet ZEV adoption:

1. Understanding the behavior shifts required to own a ZEV rather than gas-powered
2. Understanding basic science of ZEVs
3. Opportunity to test drive

Initiatives For:

1. Private Sector

Communicate ZEV fleet adoption as a corporate ESG strategy initiative

- *Provide materials to disclose environmental stewardship of ZEV fleets in public sustainability reporting e.g. CDP.*

2. Public Sector

Budget for local auto dealers to host mini “Drive Electric Weeks” exclusive for public fleet operators

- *Events provide basic science and ownership information and the opportunity to test drive.*

Supporting Policy: Develop an exclusive RFP structure to enable local dealers to sell EVs to municipalities in bulk. Government entities will benefit from economies of scale in pricing, while the local dealers get larger orders.



14 OUTREACH

OUTREACH & EDUCATION MATERIALS

Addressing the behavior shifts required to own a ZEV rather than a gasoline vehicle, as well as the basic science of the vehicles, is crucial to ZEV adoption by fleets.

Recommendation: Outreach and education materials should emphasize the contrast between electric vehicles and gasoline or diesel vehicles in these aspects: (1) the long-term financial savings; (2) vehicle range per charge or pump; and (3) the long-term environmental impacts. After this, any information on available rebates should also be presented.

Background:

Representatives from both the Sierra Club and the Electric Auto Association highlighted that these aspects are of the greatest relevance to private fleet managers. In their publications, these topics are also often addressed.

The effectiveness in this approach comes through comparing electric vehicles and conventional vehicles, as opposed to just describing electric vehicles. While descriptions outlining the basics of electric vehicles are essential and are indeed components of several existing outreach and education materials, emphasizing these differences allow fleet owners to understand how electric vehicles deviate from conventional gasoline and diesel vehicles. Corporations and fleet owners, who are already familiar with the cost, performance, and environmental impact of conventional gasoline and diesel vehicles, can gauge through this comparison how they can expect an electric vehicle to be different, and how they might need to plan to adapt their operations and/or budgets.



15 OUTREACH

OUTREACH & EDUCATION MATERIALS

Various types of fleets require different information that is more relevant to their operational styles.

Recommendation: Effective outreach and education materials benefit from showcasing best practices across different types of fleets within the state, or the U.S.

Background:

There are consequential differences within both corporate and government fleets, chiefly: the distance each vehicle travels each day, the length of intervals between each journey, and whether journeys are along fixed routes. Depending on these differences, fleets may require more tailored strategies for vehicle electrification. For instance, the behavior of transit fleets varies starkly from that of delivery fleets, and so information that is relevant to them would be different. The Electric Auto Association acknowledges these internal differences, and notes that outreach and education materials would be helpful in presenting a case study that is relevant to the fleet owner, which they can then emulate.



16 OUTREACH

PUBLIC SECTOR OUTREACH

Streamlining a procurement process for government fleets can accelerate ZEV adoption.

Recommendation: New Jersey can work with a dealer or auto manufacturer to prepare a package for fleets, which government agencies or other organizations can then purchase.

Background:

This strategy works to reduce the burden on government as fleet owners have to conduct research on which vehicles are reliable for their operations, while decreasing administrative costs and expediting the procurement of the electric vehicles. The Electric Auto Association notes that Virginia is an example of a state that has streamlined its procurement process for government fleets; its Department of General Services established a state-wide contract for electric transit buses. Similarly, California put out an RFP for a bulk purchase of vehicles for their fleets.



17 OUTREACH

PUBLIC SECTOR OUTREACH

The lack of an opportunity to test drive an electric vehicle is a barrier to adoption.

Recommendation: New Jersey should organize experiential marketing events, particularly test drives, for public officials.

Background:

Representatives from Massachusetts Department of Environmental Protection (Mass DEP) and Executive Office of Environmental Affairs (Mass EEA) have cited the pivotal importance of hosting test drives to increase the uptake of electric vehicles. These test drives should be a larger part of an educational series to communicate EV information, akin to Drive Electric Week.



18 OUTREACH

PRIVATE SECTOR OUTREACH

Messaging ZEV fleets as part of an overall Corporate Social Responsibility (CSR) strategy for public reporting can provide the tone at the top necessary to deploy EVs across an organization.

Recommendation: Engage CSR leaders in NJ's largest companies to communicate incentives for the deployment of charging infrastructure and more importantly, provide guidelines for the disclosure of corporate ZEV fleets in public reporting e.g. CDP (formerly, Climate Disclosure Project)

Background:

The majority of the publicly traded shares of NJ's largest companies (e.g. Honeywell, Cognizant Technologies, Johnson & Johnson, Merck) are owned by top institutional investors, such as BlackRock, Vanguard and State Street Global Advisors. These institutional investors are demanding increasingly more information from companies on their CSR strategy, many of which via public sustainability surveys like the CDP. Four of five of NJ's largest companies report to the CDP, making it a key ally for vehicle electrification in NJ. Not only does a CDP disclosure ease investor pressure, but high performance on ratings like CDP are proven to improve talent retention, decrease cost of capital, and increase market value.,



19 OUTREACH

PRIVATE SECTOR OUTREACH

Background Continued:

An entity's engagement with NJ DEP on ZEV adoption can be disclosed under two CDP sections worth over 30 points. A corporate ZEV strategy coupled with engagement with policy makers on reaching climate goals within their own community demonstrates a level of environmental stewardship that will yield dividends and inform a variety of stakeholder inquiries and marketing needs.

Precedent for this strategy lies in PepsiCo. In their 2017 Sustainability Report, the company boasts making the largest ever pre-order reservation for the Tesla Semi and credits it in part to their 2.1 MT reduction of CO2 emissions of a 2015 baseline.

The target audience for this outreach program is not the fleet managers, but ESG evangelists at companies. Departments of Investor Relations, Finance, and Supply Chain all hold potential project champions for energy efficiency projects like this. Interestingly, amongst NJ's largest companies are Johnson & Johnson and Honeywell. Johnson & Johnson is a darling of the CDP, routinely making the "A list," while Honeywell is an aviation company, among the world's largest polluters. Both circumstances make for prime allies in NJ DEP's overall climate goals.



