32nd Electric Vehicle Symposium (EVS32)
Lyon, France, May 19 - 22, 2019

Large Scale Public Agency Fleet Electrification in the United States, Facilitated Through Aggregate and Cooperative Purchasing

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Summary

In 2008 and 2010 the Electrification Coalition (EC) released two groundbreaking documents regarding the electrification of the U.S. transportation sector: The Electrification Roadmap and the Fleet Electrification Roadmap, respectively. These two documents outline a comprehensive roadmap for the United States to decrease its near-ubiquitous reliance on volatile oil-based fuels from the transportation sector.

By initially assessing the real or perceived barriers for municipal fleet electrification and then identifying the pathways for addressing these issues, this paper argues that aggregate fleet purchasing is an effective tool capable of providing fleets with the technical and operational support, procurement systems, community partnerships, and decision-making power to more rapidly transition to electric vehicle (EV) options. In addition, building on the foundational research of the Fleet Electrification Roadmap, this paper will introduce two recent empirical examples of aggregate fleet electrification programs deployed by the EC and its partners to facilitate widespread fleet electrification: Fleets for the Future, and the Climate Mayors EV Purchasing Collaborative.

Keywords: Fleet, market development, market, deployment

1 Introduction

The Electrification Coalition (EC) is a nonpartisan, not-for-profit group of business leaders committed to promoting policies and actions that facilitate the acceleration of electric vehicle (EV) adoption on a mass scale in order to combat the economic and national security dangers caused by the United States' dependence on oil. The EC focuses on large-scale electrification of U.S. fleets in addition to a suite of strategies to advance electrification of the consumer vehicle market which are not discussed in this paper.

This paper seeks to describe the perceived and real barriers to fleet electrification for United States cities and counties, then it will examine how aggregate fleet purchasing presents a viable option to support municipal or other government fleets in large-scale electrification. Then to unite this evidence with empirical context, two aggregate purchasing programs deployed by the EC and its partners will be discussed – Fleets for the Future and the Climate Mayors EV Purchasing Collaborative.

2 The Case for Fleet Electrification

Fleets account for the single largest homogenous component of the U.S. transportation sector [1], thereby representing a valuable opportunity to dramatically increase the rate of electrification. The predictable routing, high vehicle utilization rates, use of central parking facilities, and other characteristics common to U.S. fleets position them as a natural recipient for the many benefits of electrification [1]. Predictability of routing, for example, can enable fleets maximize the value of EV applications by right-sizing vehicle specifications. Additionally, centralized charging facilities allow fleets to more effectively operationalize their fueling processes, as well as take advantage of commercial and industrial electricity rates, which provide further vehicle cost savings [1].

2.1 Challenges for Fleet Electrification

Some of the challenges with fleet electrification lie in the processes of fleet procurement, the knowledge base and information availability about EVs for fleet operators, and executive and/or community support for electric transportation options. First and foremost, fleet operators may have concerns related to the reliability of an unfamiliar technology if they have had little exposure to EVs. Often a fleet operator's previous experience with other forms of early-market alternative fuel vehicles could impact this as well. These experiences can lead to misconceptions about EVs, such as the myth that EVs are slower than internal combustion engine (ICE) vehicles [1].

Distrust of new technologies can be fueled by the municipal fleet operator's needs to ensure vehicles are effectively achieving the intended functionality for all applications, and allow staff drivers to properly carry out their jobs [1]. As the 2010 Fleet Electrification Roadmap explains, "Fleet operators are highly unlikely to sacrifice their overall mission and deliverables for reduced transportation costs" [1]. Fleet operators may also experience a lack of access to technical knowledge about model availability, charging information, maintenance requirements, and other details that differentiate EVs from ICEs. Further, for municipal fleets in particular, if there is stigma at the community level or within city leadership about electric transportation, this will likely make it more challenging for fleet operators to move toward EVs.

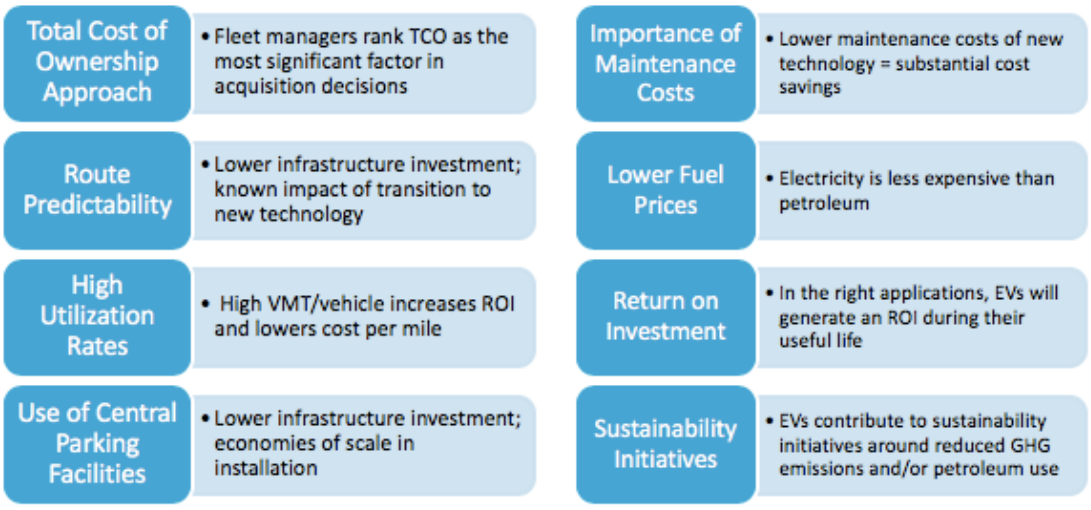

Figure 1: Benefits of Transportation Electrification for Fleets [2]

2.2 Factors that Influence Fleet Electrification Viability for U.S. Fleets

Mass fleet electrification holds significant potential to reduce oil dependence in the U.S. transportation sector. By influencing volume in battery and original equipment manufacturer (OEM) supply chains, and proving the concept of electric transportation for consumers, the market benefits of fleet electrification are widespread [1]. However, there are still obstacles when implementing mass fleet

electrification initiatives. The following are some of the most common factors that influence the viability of municipal fleet electrification.

Access to state and federal credits/rebates is an important factor that can help drive the development of a successful fleet purchasing operation in the United States by achieving price parity between EVs and comparable ICE vehicles. State and federal credits offset the sometimes higher initial purchase price of EVs and help demonstrate to fleet operators that EVs are a suitable and cost-effective alternative to ICEs. State and/or federal credits are not available to municipalities, states, or federal agencies because of the tax-exempt status, thereby inhibiting fleets from taking advantage of this benefit.

The lifecycle of existing fleets can pose challenges when attempting to transition fleets to EVs. Recently acquired fleet vehicles might still have several years of use before it is appropriate to consider purchasing more or newer fleet vehicles. Fleet purchasers must weigh the fiscal feasibility of purchasing new vehicles and factor in the lifespan of existing vehicles in order to make an appropriate purchasing decision.

The understanding of EV-specific total cost of ownership (TCO) can influence whether EVs are viewed as reasonable options for municipalities, states, and businesses. TCO measures the real cost of a vehicle over the course of its lifetime. It is frequently misunderstood for EVs because upfront costs are an influential factor for many fleets when considering which vehicles to purchase, and although EVs can sometimes have higher initial costs than ICE vehicles, the cost savings which stem from reduced fueling, maintenance, and operations costs contribute to far lower TCO for electric transportation. Understanding TCO for EVs also involves amortizing the incremental capital costs as operating expenses over the lifetime of the vehicle's use. Failing to fully account for all components that contribute to a TCO evaluation and the long-term savings can prevent fleet managers from considering EVs.

Infrastructure build out also supports fleet electrification. Existing or planned charging infrastructure can increase confidence in EVs as fleet vehicles, particularly by fleet drivers. Furthermore, promoting the visibility of charging infrastructure through clearly-marked signage offers reassurance to fleet drivers that EVs are a long-term investment with extended infrastructure to match.

Municipal staff training is imperative when transitioning to EV fleets. However, this is also a common challenge for municipalities because a lack of knowledge and access to technical assistance is one of the foremost barriers to fleet electrification. City staff may find the process of transitioning to EVs intimidating if there is a lack of accessible technical expertise and education for staff. Therefore, educational training of fleet managers, operators, staff, and drivers should be included alongside any EV fleet transition program in order to mitigate these initial challenges.

Leadership and policy support for electrification is a factor which can greatly impact the feasibility and success of fleet electrification. The absence of a concrete plan for implementing fleet transition can lead to a stagnation among administrative procedures, which therefore reduces the chances that EVs will become integrated components of fleets. In addition, municipal fleet procurement is frequently decentralized, which on one hand provides great flexibility for each city department to select the vehicles they will use, but on the other hand makes it difficult for the fleet operator to make aggregate decisions about the overall vehicle model makeup of the fleet. A clear and definitive leadership commitment and/or procurement policy regarding plans for large-scale electrification sends a signal to all levels of the fleet procurement process.

Potential state procurement policy and regulatory barriers have implications for the extent to which buyers can carry out fleet electrification programs. Policies that are unfriendly to EV procurement can make it extremely difficult for agencies to break the status quo and move away from standard

purchasing behavior. Additionally, existing procurement contracts might not provide diverse vehicle options, especially for EVs. As state procurement contracts are frequently utilized by municipal fleets, this can make it difficult for interested fleets to learn more about pursuing electrification options.

City budget timing and contracts can also prevent accelerated vehicle purchasing. Cities are often bound by existing contracts and thus remain with the models that are available through these contracts, rather than considering the transition to new options.

3 Overview of Aggregate/Cooperative Purchasing

Aggregate vehicle purchasing is one pathway that helps fleets overcome many of the perceived or real challenges experienced with electrification. Furthermore, by deploying EVs in mass quantities to replace ICE vehicles, fleets are able to more quickly attain TCO savings, and further reach municipal goals that may exist as part of the city's overall sustainability or oil-use reduction plans.

Table 1: Benefits and Drawbacks of Aggregate Fleet Purchasing [2]

Benefits	Drawbacks
• Enables fleet to own the assets • Reduces overall labor costs and timelines of bid solicitation, review, award • Produces lower prices through higher demand. • Simplifies contracting processes – single agency issues contract • Increased flexibility in vendor choices	• May not always produce the lowest prices • Procurement staff may not be in favor of new process • The options provided on the bid list may not meet local procurement requirements, such as procuring from small businesses or minority- and women-owned businesses • Vehicles desired may not be available through cooperative purchasing organizations

Aggregate purchasing creates more efficient purchasing processes and provides cost savings by pooling together multiple fleet entities and their collective demand. The administrative processes can be streamlined by compiling one singular request for proposal (RFP), collectively administering feasibility studies and securing electrification expertise. Cost savings can be attained by organizing a central purchasing mechanism that allows municipal participants to combine the purchasing power of their fleet needs into a single RFP with many vehicles, rather than pursuing multiple, separate RFPs which may result in lower per-vehicle purchase costs. Furthermore, aggregate purchasing can leverage diverse stakeholders, each with different areas of expertise, to provide a suite of tools and resources for facilitating the procurement and transition process.

This approach is a departure from the traditional model of vehicle procurement that fleet managers are familiar with. This is also generally true of fleet electrification, which involves applying a new and economically advantageous approach to an existing system. The adjustment process can be a challenge that many fleet managers, cities, states, and other procurement offices can struggle with. Fleet managers have operated under consistent processes and conditions for many years and therefore integrating new technologies, changing procurement processes, or instituting other structural revisions is difficult. Many fleet managers are hesitant to deviate from these established norms. Additionally, fleet operators perceive that aggregating demand could limit the number of available vehicle options.

3.1 Aggregate Fleet Purchasing in Practice

The General Services Administration (GSA) is a government agency that serves as the United States federal government's purchasing agent [3]. GSA has contracts with thousands of commercial vendors in order to fulfill the needs of federal agencies and employees, providing both vehicle leasing and

purchasing options, among others. State, local, and tribal governments have access to GSA's cooperative purchasing program as well. GSA classifies the scheduled contracts for cooperative purchasing by need area and also provides the option for blanket purchasing agreements (BPAs) that help deliver cost savings.

Purchasing vehicles through GSA guarantees savings of over 21 percent below the manufacturer's invoice price, and provides professional guidance and expertise for fleet procurement [4]. GSA offers a range of vehicles for purchase including alternative fuel vehicles, buses, light-duty trucks, medium- and heavy-duty trucks, and sedans, among others. GSA also offers many of these vehicle options for lease and provides their federal customers with end-to-end management services including vehicle acquisition and disposal and a wide-ranging fleet management system [4]. GSA is one example of a central body through which governments and federal bodies leverage their collective demand for lower priced products. This model eliminates the need for each individual government body to individual procurement processes. Instead it uses existing knowledge, contracts, and an understanding of collective buying power to streamline the process of procurement [4].

4 Fleets for the Future

A second example of a cooperative purchasing agreement is Fleets for the Future (F4F), a project funded by the U.S. Department of Energy Clean Cities Program, the Aggregated Alternative Technology Alliance, the EC and other national partners. This project is coordinating regional and national procurement initiatives for alternative fuel vehicles and infrastructure.

F4F has facilitated the reduction of incremental costs between EVs and ICE vehicles for fleets. It also disseminates best practices for fleet electrification including information about vehicle utilization and procurement strategies for selected vehicles and related infrastructure (see Figure 4) [5]. By providing fleets with best practices, the EC and partners have helped fleets work through challenges related to EV charging, procurement, and other technical expertise.

Figure 2: Partners Involved in Fleets for the Future [4]

4.1 Understanding Fleets for the Future: Goals and Key Outcomes

The F4F project was initially organized around a central question: can demand for alternative fuel vehicles (AFVs) be aggregated through an entity to facilitate bulk purchases at a lower cost than through individual fleet purchasing [5]? The F4F project has worked alongside EV Smart Fleets, a

program through Atlas Public Policy which addresses barriers to EV adoption for public fleets by aggregating state and local fleet EV purchases through a multi-state aggregated solicitation and procurement agreement.

One significant outcome of F4F is the development of cooperative procurement contracts. F4F has developed nine new nationally-available contracts for electric vehicle supply equipment (EVSE) and fleet management. Additionally, through the Mid-America Regional Council For Public Procurement Metro Bid, 35 alternative fuel vehicle offerings from 13 car dealerships were secured. In total, 11 vendors were awarded contracts for EV charging stations, and 16 alternative fuel vehicle types through three vendors were secured. Perhaps the most important contract to result from F4F is the relationship with Sourcewell. Sourcewell is a free, member-based organization that provides procurement contracts for a variety of products nationwide.

Another key outcome of the F4F project is the publication of series of best practices that summarize strategies and tactics for municipalities considering EV procurement. For example, the Electric Vehicle Procurement Best Practices Guide (2016) helps fleets and regionally-based buying cooperatives understand the benefits of deploying EVs as well as the EV-specific considerations involved in the procurement process [6]. This guide delves into the specificities of different types of EVs including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) as well as light- and heavy-duty options. The guide also discusses the technical considerations for deployment of EVs.

4.2 F4F Lessons Learned

Fleets for the Future has set a precedent for fleet electrification and other alternative fuel vehicles through its innovative vision and structure. The project has produced significant outcomes including those described above. In achieving these impacts the project has also developed implementation lessons which are valuable in replicating the project's impacts. One of the biggest lessons for a project of this magnitude is how to effectively disrupt purchasing behavior within a norm-based system. Fleet purchasing usually occurs through existing contracts—typically state contracts or vendors with well-established relationships with the purchaser. F4F identified the potential to reduce the transaction costs of vehicle purchases by providing a single vendor through which all members could fulfil their needs. However, convincing fleet operators to shift away from their typical habits for fleet purchasing has been a difficult task for F4F at scale. Ultimately demonstrating the value of a new model of procurement and gaining some initial "wins" with projects that have created positive outcomes, has helped to overall motivation for participation among fleets.

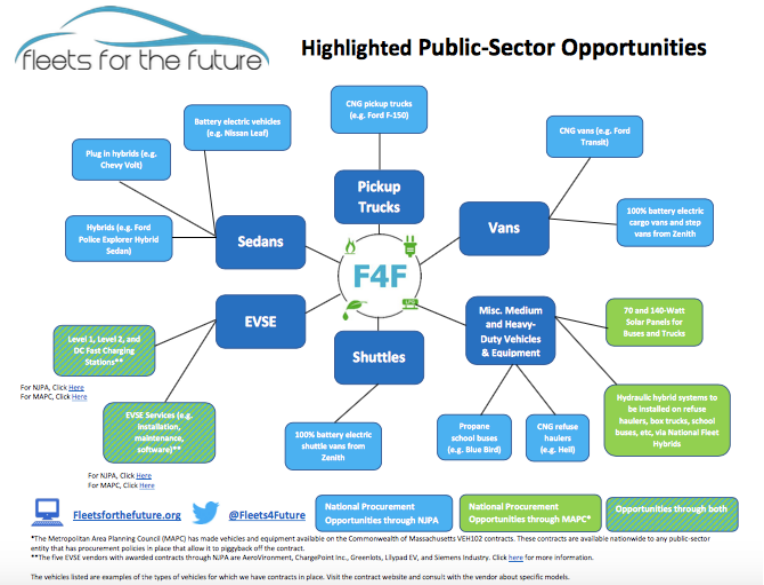

Figure 4: Highlighted Public-Sector Fleet Opportunities Through Fleets for the Future [4]

4 Climate Mayors EV Purchasing Collaborative

In 2017, in response to the United States' withdrawal from the Paris Climate Agreement, a coalition of more than 400 American cities, representing more than 70 million Americans came together to form Climate Mayors [7]. Climate Mayors is committed to maintaining America's commitment to the Paris Climate Agreement by building meaningful actions in the participating communities and establishing norms and values that guide future urban policy action related to climate change [7]. To facilitate action in the area of clean transportation, Climate Mayors launched the Climate Mayors EV Purchasing Collaborative (the Collaborative) in partnership with the Electrification Coalition and Sourcewell.

Initially, 19 cities and two counties in the U.S. came together to launch the Collaborative, which now provides an aggregate purchasing platform and a comprehensive portal through which cities can access data regarding EV pricing and charging infrastructure. Collectively, as of March 2019 the 45 participating cities and counties in the Collaborative have committed to purchasing 940 EVs, which represent approximately $28 million in electric transportation-related investment.

Motivations for this effort were spurred through a Request for Information (RFI) released by the City of Los Angeles in 2017 in collaboration with 30 other cities, with the goal of aggregating the collective demand for EVs among the nation's fleets, and particularly municipal fleets [7].

4.1 The Importance of Partnerships

The Collaborative represents the next phase of aggregate purchasing by combining the right stakeholder support, planning processes, systematic solutions, and expertise to electrify U.S. fleets. One of the principal factors that turned the Collaborative into a reality was strong its public-private partnership model representing municipal, non-profit, and industry engagement.

In addition to leading the RFI effort, the City of Los Angeles has also led by example by setting aggressive fleet electrification goals and moving forward on the city's fleet electrification targets. The City has already integrated EVs into various applications including non-pursuit police vehicles. Additional program momentum has built through other Climate Mayors city leadership, which has demonstrated the significance of subnational governance in issues of economic and environmental importance. Cities are incubators of innovative thinking and meaningful leadership has the potential to immediately impact constituents.

A large and influential city like Los Angeles served as the bastion of the vision of the Collaborative. The initial RFI submitted by Los Angeles and the 30 other cities was one of the key factors that fueled the development and expansion of the Collaborative and illustrated how innovative thinking at the municipal level has the potential to fuel significant EV deployment. The feedback and suggestions that stemmed from the initial RFI supplied the guidance that allowed the F4F model to be applied on a nation-wide scale by focusing on city leadership. However, finding the right vendors and/or contractors to supply the EVs was also a foundational element in the creation of the Collaborative. The Electrification Coalition is one such partner, which provides technical expertise for the implementation of the Collaborative and fleet electrification in general for participating entities.

Finally, Sourcewell joined the Collaborative to serve as the project's primary procurement partner. Sourcewell provides competitive pricing for EV models and EV charging equipment. When the Collaborative was under development, the program sought a procurement partner that would offer specific EV options at a competitive price, which Sourcewell fulfilled. Sourcewell's role as the project's primary procurement partner allowed the Collaborative to provide competitive pricing for participating cities. Sourcewell provides the ability to streamline procurement processes through central RFPs that are highly competitive due to the combined nature of aggregation, compared to the results of an RFP released by one entity alone [8]. Engaging an organization that serves as the central purchasing entity was one of the essential pieces that helped turn the Collaborative into a successful partnership.

Figure 5: Participating U.S. Climate Mayors Cities (August 2018)

5 Conclusions

Aggregate purchasing is a tool that can promote a smooth and cost-effective transition to electric transportation for fleets. By addressing and solving the barriers associated with fleet electrification, the aggregate purchasing initiatives deployed by the EC and its partners are influencing a large-scale shift in the U.S. transportation sector.

Several examples of aggregate fleet purchasing mechanisms were discussed including Fleets for the Future and the Climate Mayors Electric Vehicle Purchasing Collaborative. Both projects demonstrate the effectiveness of aggregate purchasing to circumvent some of the barriers fleets experience in the process of fleet electrification. The F4F project provides best practices and technical guidance for fleets considering alternative fuel vehicles. The Collaborative is a second example of a program that supplies a central mechanism through which cities and counties throughout the United States can access the benefits of cooperative purchasing, integrate the technical expertise of partners like the Electrification Coalition, and raise awareness of the crucial role electric transportation plays in reducing oil use in the U.S. transport system.

Acknowledgments

The Electrification Coalition would like to acknowledge all partners involved in both of these projects especially Climate Mayors, Climate Mayors EV Purchasing Collaborative, Sourcewell, the City of Los Angeles and all Climate Mayors cities, all partners involved in Fleets for the Future, and all other partners involved in the Climate Mayors EV Purchasing Collaborative.

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Authors

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Natalia Swalnick has more than a decade of experience and knowledge in public policy issues related to transportation and energy. She manages the planning and execution of projects that support the accelerated adoption of plug-in electric vehicles (EVs) and smart mobility for the Electrification Coalition, as the Director of Electric Vehicle and Smart Mobility Programs. This work includes EV accelerator communities in northern Colorado, Orlando and Rochester as well as supporting the Smart Columbus program in Ohio. Natalia has expertise in consumer adoption tactics and workplace charging in the EV market, and manages national fleet electrification efforts.

Annie Freyschlag has worked with the Electrification Coalition helping to develop the organization's strategic initiatives since 2013. She helped develop the EC's Accelerator Community program through the Drive Electric Northern Colorado initiative including partner and stakeholder engagement, outreach and education programs, public-private partnerships, and other areas of work. She has also supported the Paul G. Allen Smart City Challenge, Smart Columbus program, Drive Electric Orlando, Drive Electric Rochester, Mobility Innovation Challenge, Fleets for the Future, Climate Mayors EV Purchasing Collaborative, and other EC initiatives. Annie continues to support the EC's various programs around the U.S. as a consultant.

James Thompson is a Program Intern for the Electrification Coalition. He began working for the EC in 2018 and provides assistance to the EC in various initiatives. James is a student at the University of North Carolina- Chapel Hill (UNC) studying Political Science and Global Studies. He has been an active participant in shaping academic policy at UNC and has also helped facilitate student engagement on campus through his work with Executive Branch Student Government.