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Electric Freight Consortium: Driving EVs at Scale

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Executive Summary

The Electric Freight Consortium (EFC) is a collaborative space for cross-cutting industry partners to convene in a peer-to-peer forum. Leveraging the Electrification Coalition's (EC) direct experience in policy action and real-world electric vehicle (EV) deployment, the EFC capitalizes on freight and large-scale industry perspectives, collectively identifying policy priorities, financing mechanisms, and procurement/deployment tactics to tackle common barriers and drive successful freight electrification. The consortium also shares lessons learned from pilots and proof-of-concept leaders implementing freight electrification at scale, capturing market transportation in real-time for broader impact across the sector.

Keywords: deployment, consortium, electric vehicle (EV), heavy-duty, freight transport

1 Introduction

For over a century, the global economy has been almost entirely reliant on petroleum-based fuels to move goods across its roadways. This reliance creates significant energy and economic vulnerabilities, such as relying on oil from countries that manipulate supply, fix prices, and create inequitable systems. The global commercial transportation sector's reliance on oil adversely impacts the environment and public health, worsening air quality and respiratory diseases attributed to tailpipe emissions. Approximately 180,000 people die each year from the effects of pollution from on-road diesel vehicles [1]. These public health impacts disproportionately affect disadvantaged communities because of their proximity to major highways, rail yards, freight depots, and ports [2]. Recognizing the steep growth of road freight operations, now is the time to accelerate the adoption of electrified freight. Electrified freight vehicles offer many advantages over their diesel counterparts. The electricity they consume can be generated domestically from a diverse set of energy resources, with a growing share of this electricity coming from cleaner and renewable resources. In the United States and many other countries, electricity prices have historically been lower and more stable than diesel and gasoline prices [3]. Electric trucks emit zero tailpipe emissions, have a lower total cost of operation, and are starting to achieve total cost of ownership parity with diesel [4]. While the availability of cost-effective electric freight vehicles is growing steadily, additional support is needed to achieve widespread adoption.

In order to accelerate the adoption of electric freight, the Electrification Coalition (EC) launched the Freight and Goods Delivery Electrification Project. The project was a collaboration between the EC and its corporate fleet partners, specifically shippers, to support these companies on their electric freight deployment projects. The EC provided technical and strategic support to its corporate partners to overcome the challenges of

adopting battery-electric medium-and heavy-duty (MHD) vehicles and the associated charging infrastructure. Through the Freight and Goods Delivery Electrification Project and the conversations with the EC's corporate partners, it became apparent the need to develop a forum for ongoing collaboration and support that could address the challenges the EC observed fleets experience when engaging in deployment projects. The EC worked closely with its' fleet partners to strategize and develop a forum for collaboration and ultimately launched the Electric Freight Consortium (EFC) in September 2022 at the Global Clean Energy Action Forum.

2 Electric Freight Consortium

The Electric Freight Consortium (EFC) serves as a cohesive forum for collaboration that facilitates peer-to-peer exchange and dialogue to accelerate freight electrification in the United States. The EFC is shipper and carrier focused as these stakeholders are critical to the adoption of electric MHD vehicles. In recognizing the benefits of collaboration among companies across the value chain, members of the EFC also include electric vehicle original equipment manufacturers (OEMs), electric vehicle supply equipment (EVSE) providers, technology providers, depot property owners, and fleet management companies. Similar to shippers and carriers, these stakeholders are vital to the advancement of electric freight. Their membership in the EFC allows for a deeper and more expansive knowledge base of the industry that can be utilized to identify challenges and develop new solutions. At the start of 2023, the EFC has grown to over 35 members and is constantly evolving to best address the needs of the members. While the EFC has the overarching goal of accelerating the adoption of electric MHD vehicles, there are three pillars of work that lay the foundation for meeting this goal: policy implementation and advocacy, identify barriers and share solutions, and strengthen collaboration. This paper will first describe these pillars of work and why they are needed to accelerate freight electrification. Then discuss the structure of the EFC, and lastly describe the areas of market advancement and progression that the EFC is targeting in 2023.

3 Pillars of Work

The EC identified three pillars of work that serve as a foundation for the structure of the EFC. These pillars of work are critical to the ultimate advancement of electric freight, and through aggregating the voices of the EFC around the pillars, the EFC will be more successful at increasing the adoption of electric vehicles.

3.1 Policy Implementation and Advocacy

The EFC develops policy priorities and will activate policy advocacy to address the challenges associated with freight electrification. The development of policies supportive of the adoption of electric MHD vehicles is critical to the advancement of a zero-emission transportation sector. The importance of proactive policies can be observed at the state and federal levels. At a state level, California has adopted ambitious policies that both require and incentivize the adoption of electric MHD vehicles. Policies such as the Advanced Clean Trucks (ACT) rule require manufacturers that sell MHD vehicles to sell zero-emission vehicles as an increasing percentage of their annual sales from 2024 to 2035, and the proposed Advanced Clean Fleets rule which is a purchase requirement for MHD fleets to adopt an increasing percentage of zero-emission trucks, encourage the development of a robust market for electric MHD vehicles [5]. By creating confidence in the availability of electric MHD vehicles and requiring fleets to adopt increasing percentages of electric MHD vehicles, the market for electric trucks will advance at an accelerated rate.

At the federal level, the Inflation Reduction Act (IRA), passed in 2022, provides substantial new funding for zero-emission MHD vehicles. Specifically, IRA creates the Commercial Clean Vehicle Credit worth up to \$40,000 for electric MHD vehicles, extends and expands the Alternative Fuel Vehicle Refueling Property Credit and establishes the Clean Heavy-Duty Vehicle Program to replace diesel Class 6 and 7 vehicles with zero-emission vehicles [7]. Analysis of IRA found that the total cost of ownership (TCO) of an electric MHD vehicle will be lower than the TCO of a diesel vehicle approximately five years sooner than without the IRA [7]. Due to reduced cost of electric MHD from IRA and technology improvements, the International Council on Clean Transportation (ICCT) found a range of 39%-48% EV sales share in the medium-and heavy-duty sector by 2030. This would exceed the Biden administration's goals of a 30% heavy-duty EV sales share by 2030 [8]. Policies that address challenges such as the high upfront cost of electric MHD vehicles have a

significant impact on the market share of EVs. Beyond reducing the cost of the vehicles, IRA sends strong market signals and further encourages the industry to move towards electrification. Additionally, IRA builds upon the provisions included in the Bipartisan Infrastructure Law that will accelerate the adoption of electric vehicles.

The EFC utilizes the Electrification Coalition's expertise in policy implementation to share key funding opportunities with the EFC and ensure members are realizing the benefits of these two unprecedented investments into electric MHD vehicles. The EC directly engages with the state and federal departments that are providing the funding to ensure information on funding opportunities is efficiently disseminated to EFC members. The EFC prioritizes policy implementation and advocacy as a core pillar because of the need to ensure funding opportunities are successfully utilized by members and to achieve the intent of the policy – to increase adoption of electric MHD vehicles.

3.2 Identify Barriers and Share Solutions

The EFC has members throughout the entire electric freight industry which allows the consortium to effectively identify the common barriers that stakeholders are experiencing when deploying electric MHD vehicles. The EFC aggregates the experiences of EFC members to determine the common challenges and discover new solutions to catalyze market expansion. Additionally, through open dialogue with members, the EFC gathers key lessons learned from deployment projects and establishes these as best practices and guidance resources to share with the broader electric freight ecosystem.

Electric MHD vehicles are a nascent technology, and lessons learned from initial deployments provide critical insight into the challenges and potential solutions to barriers. In 2020, the EC published *Electrifying Freight: Pathways to Accelerating the Transition*, which is a report that identified the major barriers impeding the deployment of electric freight. In order to identify the common barriers, the EC interviewed key stakeholders such as EV OEMs, private and public fleets, electric utilities, EVSE providers, and other non-profit organizations. The EC aggregated the findings from the interviews into an educational resource that identified barriers and new solutions to overcome the challenges. These challenges and lessons learned provided valuable information to fleets seeking to start their electrification journey, and to the many other stakeholders such as electric utilities, truck OEMs, EVSE providers, and technology providers that have a critical role in advancing electric MHD vehicles. The EFC utilizes the robust network of stakeholders involved in the consortium to share the challenges and identify new solutions that will assist stakeholders in adopting electric MHD vehicles.

3.3 Strengthen Collaboration

The third pillar of work for the EFC is to strengthen collaboration. The EFC facilitates relationships and collaboration among the industry leaders involved in the electrification of MHD vehicles. Collaboration is critical to the deployment of electric MHD vehicles because of the complexities in stakeholder engagement. Key external parties that fleets must engage with include electric vehicle OEMs, EVSE providers, state departments in charge of rebates or incentive programs, grant writers, and electric utilities in the region where vehicles are deployed [10]. The EFC brings together these stakeholders through direct membership in the EFC (fleets, OEMs, EVSE providers) or as guest speakers (electric utilities, state and federal departments involved in funding opportunities) during EFC events. Thus, the EFC is a forum that allows for direct communication and relationship building throughout the entire electric freight industry. Members will have a greater awareness of electrification opportunities and can even seek partnership opportunities with other members in the EFC due to the collaborative nature of the EFC. The EFC is well positioned to strengthen the collaboration that occurs in freight electrification which is critical to the acceleration of electric freight.

4 Structure of the EFC

The EFC is structured to advance the three pillars of work and ultimately accelerate the deployment of electric MHD vehicles. The EFC has quarterly meetings on key topics in freight electrification, share challenges, and discuss best practices for effectively deploying electric vehicles. In addition to the quarterly meetings, the EFC hosts monthly working group meetings on specialized topics that are critical to the adoption of electric MHD vehicles: Electric Utility Engagement, Technology Development, and Policy Development and

Advocacy. Beyond hosting meetings that allow for open dialogue among members, the EFC focuses on resource sharing. The EFC has created and is in the process of creating educational materials to share with EFC members to help them become more informed stakeholders involved in freight electrification. The Electrification Coalition launched the EV Funding Finder Tool which helps eligible recipients sort through available federal funds for transportation electrification [11]. To expand upon the tool, the EC is developing a factsheet that outlines the funding streams available to shippers and carriers and highlights the pathways to obtaining federal funding. The EFC has launched a monthly newsletter that provides information on the electric freight industry to assist EFC members with staying up to date with the constant stream of information on electrification efforts. These educational resources provide members with the information required to make informed decisions that work to advance freight electrification in their own section of the freight industry. Additionally, these resources are the tools and building blocks to support companies in finding creative solutions and pathways to electrifying fleets at scale

Lastly, the EFC engages with “Thought Partners” which is a classification used by the EC to describe non-profits, academic institutions, trade associations, and consultants that are working on freight electrification. The EFC is engaging with thought partners in a meaningful and intentional manner that will allow the EFC to increase the resources and opportunities that can be shared with members. The EFC views thought partners as partners in achieving the EFC’s goals of scaling freight electrification by leveraging each organization’s strengths and audiences. Electrification cannot happen in silos and this collaboration adds value to the EFC as the EC is able to aggregate the work of thought partners and maintain those relationships to provide the resources and opportunities to members.

The EFC is structured to effectively engage and support members in their electrification goals and adheres to the pillars of work identified above. Through the EFC quarterly and monthly meetings, collaboration and discussion on key barriers and potential solutions can occur. Resource sharing and providing educational materials assist EFC members in overcoming the complex barriers to freight electrification. Engagement with thought partners allows the EFC to leverage a greater network and strengthen the resources and support provided to members. Collectively, the structure of the EFC allows the consortium to make advancements in key areas of freight electrification.

5 Areas of Market Advancement and Progression

The EFC has selected three areas for market advancement which are the focus of the monthly working group meetings. The three topics, electric utility engagement, technology development, and policy development, were selected based on input from EFC members on the challenges they are experiencing when working on freight electrification. These issues are highly interconnected and dependent on each other for the successful large-scale deployment of electric MHD vehicles. For each topic, there are unique barriers that fleets must overcome to electrify their MHD vehicles. Thus, the EFC has selected these three topics to discuss with EFC members and determine pathways to make each category more supportive of the deployment of electric MHD vehicles. The following section will describe the challenges experienced in each topic and the ways the EFC is seeking to address these barriers.

5.1 Electric Utilities Engagement

Electric utilities are key stakeholders in the electrification of MHD vehicles and will play an important role in supporting fleets as they electrify their vehicles. Electric utilities determine the policies for charging infrastructure buildout and electricity rate design which both impact the successful deployment of electric MHD vehicles. Additionally, electric utilities can assist the electrification of MHD vehicles in a variety of ways. They can assist with fleet planning and site assessments, prepare and plan interconnection and capacity upgrades, incentivize fleets with rebates for charging infrastructure, and design electricity rates that are understanding of the operational complexities associated with the different duty cycles of electric MHD vehicles [12,13]. Challenges arise due to the number of electric utilities in the U.S., and the differences in how each electric utility engages with transportation electrification efforts as well as the planning, energy and capacity demands that freight electrification will require.

There are more than 3,000 electric utilities in the U.S. [12], and fleets often need to work with multiple utilities with different coverage areas. As fleets seek to scale up their electrification projects, procuring

charging infrastructure and engaging with multiple electric utilities becomes increasingly complex. Thus, the EFC is engaging with members to discuss the common challenges that occur when engaging with electric utilities and identify opportunities to address these barriers. Through input from EFC members, the EFC has identified the following electric utility areas to explore: freight corridor infrastructure development, charging standards and interoperability, electricity rate structure and design, and utility fleet advisory services. Each electric utility working group meeting will discuss one of these topics and bring in relevant guest speakers to provide additional information on these topics. Ultimately, the EFC will create a briefing on recommendations for electric utilities to adopt based on member feedback. These recommendations will highlight the actions electric utilities can take to address the common challenges and concerns fleets have when engaging with electric utilities.

5.2 Technology Development

Electric MHD vehicles are a relatively nascent technology and fleets have questions and concerns regarding the performance of these vehicles once deployed since multiple factors impact their range and performance. Variables such as the size of the battery, driving style, the length of the route, topography, and weather conditions all can impact the performance of an electric MHD vehicle [14]. Pilot projects such as the Volvo Lights project in Southern California, and NACFE and RMI's Run on Less-Electric demonstration project, provide critical information into the real-world performance of electric MHD vehicles. The technology development working group will utilize information from pilot projects occurring throughout the industry as well as projects EFC members are actively engaging in to share key lessons learned. Through EFC member engagement, we identified additional topics related to technology development such as vehicle battery production and recycling, factors for fleets to consider when purchasing an electric MHD vehicle, energy generation using microgrids, and EVSE technology developments.

The technology development working group aims to publish briefings that can be shared with the electric freight industry on the topics mentioned above. Additionally, the EFC will identify the gaps in available technology and provide insights into what fleets need to be successful in their deployment of vehicles. These findings will inform stakeholders on the supply chain such as vehicle OEMs, EVSE providers, and technology providers.

5.3 Policy Development and Advocacy

The Policy Development and Advocacy working group aims to aggregate the voices and concerns of EFC members into policy priorities. Through collaboration and input with EFC members on their experiences in freight electrification, the EFC identified key priorities that must be accomplished to accelerate freight electrification and the policy solutions that can advance these priorities. Priorities identified include the following:

- Address the high upfront purchase cost for electric MHD vehicles and the associated charging infrastructure.
- Encourage states to use the federal funding from the Inflation Reduction Act and Bipartisan Infrastructure Law to support the adoption of electric MHD vehicles. Support the implementation and expansion of programs on MHD vehicle electrification included in the Inflation Reduction Act and the Bipartisan Infrastructure Law at the state and Federal levels
- Ensure the development of a robust network of charging infrastructure for electric MHD vehicles.
- Support and encourage market development of electric MHD vehicles.
- Support electric utilities and public utility commissions in preparing for the mass adoption of electric MHD vehicles.
- Create vehicle weight guidance that is supportive of fleets utilizing electric MHD vehicles.
- Support the creation of efficient and secure supply chains for electric vehicle components such as batteries and charging infrastructure components.

The three areas of market advancement; electric utilities, technology development, and policy development and advocacy, are the guiding “north stars” for the work the EFC is leading in 2023. Within each area, the three pillars of work outlined above, policy implementation, overcoming barriers and sharing solutions, and strengthening collaboration, are the main ways the EFC engages with these topics. By focusing the EFC's

efforts on three areas of market advancement, the consortium will be more successful at making direct improvements in these categories. As the EFC continues to lead work in freight electrification, additional areas of market advancement may be discovered and added as a new focus for the consortium.

6 Conclusion and Next Steps for the EFC

Since the launch of the EFC, the consortium has grown in membership and seeks to increase the influence it has on the overall electric freight industry. Through collaborative and engaging discussions with EFC members during monthly working groups and quarterly meetings, the EFC aggregates the voices and wisdom of our members and serves thought leader in this space. Additionally, as the EFC continues to develop, the following areas will be central to the work the EFC does in the remainder of 2023 and into 2024.

The EFC will continue to develop valuable educational materials that are accessible to both EFC members and external audiences. Specifically, the EFC will host webinars on topics within the areas of market advance and progression which include electric utility engagement, technology development, and policy development and advocacy. The EFC will publish case studies featuring the work of consortium members to increase awareness of the innovative ways stakeholders are overcoming barriers to freight electrification. In addition to creating more educational resources, the EFC will increase partnerships with disadvantaged communities and community-based organizations working on freight electrification. The EFC seeks to bridge the gap between private-sector companies such as retailers and shippers, and the communities that disproportionately face the environmental harms related to freight [2].

Through meaningful engagement with community-based organizations, the EFC can support members in addressing their sustainability goals while ensuring the voices and concerns of local communities are not overlooked. Lastly, the EFC will connect with international stakeholders in freight electrification, such as the Smart Freight Centre and the Center for Reimagined Mobility, which have an international approach to freight electrification. By taking an international perspective on freight electrification, the EFC can increase the expertise and resources available to members and learn from pilot projects in other nations. Overall, the EFC aims to become a leading voice in the freight electrification industry as a trusted resource to support the private sector in its' efforts to electrify.

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Presenter Biography



Steve King is the Senior Manager of Freight Electrification for the Electrification Coalition. He works with industry leaders like Nestlé, FedEx, Meijer, and Volvo to reduce the sector’s reliance on petroleum fuels. Prior to joining the EC Steve’s previous work focused on workforce development, sustainability, entrepreneurship, and equity. He is the founder and former CEO of the Barack Obama Green Charter High School, New Jersey’s first charter high school focused on sustainability.