

Fleet Electrification Workshop

Electrifying Fleets for a Sustainable Future



CENTER FOR OPERATIONAL
EXCELLENCE

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Executive Summary

The AEIC’s Center for Operational “**Fleet Electrification Workshop: Electrifying Fleets for a Sustainable Future**” workshop convened U.S. electric utilities, vehicle OEMs, and solution providers in Denver to share experiences and strategies for accelerating fleet electrification. Over two days, participants focused on five focal themes:

1. Transitioning utility internal fleets to electric (ensuring infrastructure readiness, smart charging design, and realistic planning timelines).
2. Expanding customer/commercial fleet programs (advisory services, incentives, and education to support fleet owners while addressing interconnection hurdles).
3. Enhancing resiliency for fleet operations (using mobile charging units, backup systems, and emergency response planning).
4. Implementing load management and telematics solutions (managed charging, vehicle-to-grid pilots, and data-driven optimization).
5. Recognizing cross-cutting challenges that slow adoption (from lengthy grid upgrades to stakeholder uncertainty).

The workshop’s collaborative discussions yielded several actionable insights:

- **Lead by Example:** Utility participants are aggressively electrifying their own fleets to meet decarbonization goals, piloting new EV truck technologies and charging solutions internally as a proving ground. These efforts not only reduce utility emissions but also provide valuable lessons in charger deployment and change management that can be shared with customers.
- **Bridging the Knowledge Gap:** Both utilities and OEMs stressed the importance of advisory support for fleet managers. Providing one-stop guidance – from vehicle selection and route analysis to infrastructure planning and rate optimization – is crucial to help fleets lacking in-house EV expertise. Several utilities have launched free fleet advisory services to shepherd commercial fleet customers through the complex electrification process.
- **Infrastructure Innovation to Save Time:** Traditional make-ready infrastructure can take years; thus, creative charging strategies are emerging. For example, deploying mobile DC fast chargers and interim “flexible” connections can dramatically shorten lead times for fleet charging deployment. These stopgap solutions allow fleets to charge EVs now – and even provide emergency power – while permanent upgrades and permits catch up.
- **Resiliency & Grid Integration:** Ensuring fleet operations during outages or peak demand events is a growing focus. Utilities are exploring resiliency tiers for fleet depots, pairing critical vehicles with backup power or fast-charge capabilities to sustain emergency response. Meanwhile, vehicle-to-grid (V2G) pilots are demonstrating how electric school

buses and trucks can send power back to the grid or facilities when needed, hinting at a future where fleets act as distributed energy resources in exchange for incentives.

- **Managed Charging & Load Flexibility:** Uncontrolled charging can spike costs and strain the grid, so managed charging strategies are being baked into fleet plans from the start. Telematics data and smart charging systems enable load spreading and off-peak charging to minimize new demand peaks. Additionally, utilities like PG&E are testing dynamic Flex Connect interconnections that allow fleets to draw power up to a limit and automatically scale back usage if the local grid reaches capacity. This flexibility can accommodate EV growth without immediate feeder upgrades.

Overall, the workshop underscored a holistic approach, encompassing vehicles, chargers, grid, and people needed to electrify fleets at scale. The exchange of real-world pilot results, frank discussion of challenges, and innovative solutions (from modular chargers to policy pilots) left attendees with a clearer roadmap. Key opportunities for moving forward include deploying mobile fast chargers to expedite projects, expanding fleet advisory and training programs, refining interconnection processes, and developing playbooks for site readiness. By acting on these insights in a coordinated way, utilities and their partners can accelerate fleet electrification timelines while maintaining reliability and customer trust.



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AEIC Center for Operational Excellence

The mission of AEIC’s Center for Operational Excellence is to provide the electricity industry with authoritative information as a basis for decision-making on local, state, and federal infrastructure investments. The Center facilitates industry projects addressing critical challenges such as supply chain management, grid reliability, electrification, and technological innovation. By fostering collaboration and sharing best practices, AEIC ensures stakeholders are equipped with actionable insights to navigate the dynamic energy landscape. This workshop underscores AEIC’s ability to convene diverse perspectives to tackle industry challenges and advance operational excellence.

Fleet Electrification Workshop Context

This workshop was part of AEIC’s Center for Operational Excellence Critical Issues Forum series, hosted by Xcel Energy in Denver, CO, on June 3–4, 2025. It brought together a focused group of 17 participants representing a diverse range of stakeholders including electric utilities (investor-owned and public power), vehicle and equipment manufacturers, and EV infrastructure solution providers; all centered around advancing fleet electrification. Nearly a dozen case studies and panels were featured, including utility-led presentations from Xcel Energy, Pacific Gas & Electric

(PG&E), and Salt River Project (SRP), as well as industry insights from Volvo Construction Equipment, Navistar (International® Trucks/IC Bus), and Xos Fleet, Inc. The two-day agenda balanced internal utility fleet transitions (i.e. “driving change from within”) with external customer support programs and industry innovation, reflecting the workshop’s strategic aim: to explore infrastructure needs, operational strategies, and collaborative approaches required to electrify fleets for a sustainable future.

Day 1 sessions focused on setting the stage and sharing utility experiences. Xcel Energy opened with an overview of its corporate fleet electrification strategy, followed by PG&E highlighting programs to electrify customer fleets across its region. Volvo CE presented a case study on converting heavy construction machinery from diesel to electric, shedding light on off-road electrification. PG&E then returned to share how it is electrifying its own utility fleet and preparing the grid for large-scale transportation electrification. Lively roundtable discussions capped the day, distilling common needs and concerns.

Day 2 shifted to implementation and technology enablers. SRP discussed its comprehensive transportation electrification initiatives (covering fleet, workplace, and customer programs). Two industry solution sessions followed: International (Navistar) offered a “utility support perspective,” explaining how a truck OEM can assist utilities and fleet customers in the EV transition; and Xos Fleet, Inc. demonstrated its mobile charging systems as a flexible tool for fleet electrification and resiliency. Through Q&A and open dialogue, participants dug into topics like project management bottlenecks, rate design, charging standards, and emergency planning. The collaborative tone of the workshop reflected a shared recognition that utility and industry partnerships are essential to overcome the challenges discussed.

Advancing Fleet Electrification Through Utility Innovation and Industry Collaboration

Case studies and discussions emphasized the dual track of electrifying internal utility fleets while enabling external customer adoption. Xcel Energy outlined its cross-functional planning and grid impact assessments to guide internal fleet deployment across diverse operating environments. PG&E presented two complementary strategies: a flexible interconnection model (“Flex Connect”) for accelerating customer EV deployments and a zero-cost Fleet Advisory Services program to guide commercial fleet owners through feasibility analysis, site planning, and long-term transition.

SRP shared its Transportation Electrification Activator framework, illustrating how internal electrification efforts informed customer offerings and stakeholder coordination. On the industry side, Volvo Construction Equipment and Navistar highlighted their progress in electrifying heavy-duty vehicles that are typically diesel-powered. They focused on key challenges such as vehicle

weight, duty cycles, and maintaining operational uptime. Xos Fleet, Inc. presented the Xos Hub, a mobile charging solution designed to support fleet operations in areas where grid access is limited, or infrastructure is still being developed.

Cross-cutting themes included:

- Integrating mobility, operations, and grid planning for long-term fleet transformation
- Addressing capital and infrastructure constraints through flexible, scalable solutions
- Supporting customers with education, technical guidance, and site readiness scoring
- Leveraging mobile or temporary charging to bridge infrastructure timelines and build resiliency
- Elevating equity by prioritizing smaller fleets and under-resourced users in program design

Gaps / Challenges

The workshop brought to light several persistent barriers utilities and their partners face in electrifying both internal and customer fleets. These ranged from logistical hurdles in infrastructure development to capacity limitations within customer organizations and vendor ecosystems. Identifying and resolving these challenges is essential to accelerating equitable, scalable fleet electrification.

Table 1. Key Challenges in Advancing Fleet Electrification

#	Gap / Challenge	Description
C1	Long Interconnection Timelines	Many sites face multi-month delays due to permitting, design cycles, or limited grid capacity.
C2	Fleet Operator Readiness	Many fleet customers lack experience with load management, permitting, or electrification planning.
C3	Behind-the-Meter Cost Barriers	High costs for site construction and charging infrastructure deter adoption, especially for small fleets.
C4	Infrastructure Flexibility Gaps	Most projects assume static energy needs; few integrate scalable or mobile charging early in planning.
C5	Cross-Department Disconnects	Fleet, facilities, and energy management staff are often siloed, delaying or misaligning project execution.
C6	Unpredictable Equipment and Labor Availability	Long lead times for switchgear, contractors, or charging hardware disrupt timelines and coordination.



Path Forward Opportunities

Building on the identified challenges, attendees outlined practical and scalable solutions to accelerate fleet electrification across the utility ecosystem. These strategies emphasize early planning, adaptive infrastructure models, cross-sector coordination, and focused support for smaller or under-resourced fleets.

Table 2. Strategic Opportunities to Accelerate Utility and Customer Fleet Electrification

#	Opportunity	Description
O1	Mobile Charging as a Transitional or Emergency Tool	Solutions like the XOS Hub offer a bridge while awaiting permanent infrastructure or as backup in outages.
O2	Integrated Load Management and Site Planning	Utilities should incorporate load planning tools and demand flexibility into early project design.
O3	Flex Connect / Flexible Interconnection Pilots	Programs like PG&E's Flex Connect enable staged capacity delivery with utility-managed load profiles.
O4	Utility-Funded Advisory Services	Models like PG&E's zero-cost Fleet Advisory Program help de-risk planning for resource-constrained fleets.
O5	Prioritize Smaller Fleets in Equity-Centered Electrification Programs	Target small and under-resourced fleets with high-reward potential for education and funding support.
O6	Streamline Cross-Utility Best Practices into a Playbook	Documenting design templates, advisory models, and timelines can accelerate fleet electrification scale-up.

Conclusion

The AEIC Fleet Electrification workshop in Denver served as a productive convergence of ideas and expertise at a critical juncture in the transportation-energy transition. Utility representatives gained insight into the latest vehicle technologies and field solutions, while industry partners better understood utility and customer pain points. The overarching conclusion was one of qualified optimism: Electrifying fleets at scale is certainly challenging, but it is achievable through strategic planning, innovation, and partnership. Utilities will need to work closely with fleet owners, equipment manufacturers, policymakers, and each other to share lessons and develop consistent approaches.

AEIC will continue to support members through additional forums, working groups, and case-sharing efforts that bridge technical, organizational, and strategic challenges, ensuring utilities are not only prepared for the future, but actively shaping it.