Alliance for Transportation Electrification

Summary of Publications

Recent Literature on EV Energization for Small Fleets & Multifamily Housing

November 2025

Steering EV Policy in the States

Overview

The U.S. Department of Energy (DOE) provided support for a study by EPRI, designed to understand gaps and opportunities to improve electric vehicle supply equipment (EVSE) energization timelines and experiences, focusing on two small commercial customer segments: businesses with small vehicle fleets and multi-family housing (MFH) properties. The Alliance for Transportation Electrification, RMI, the Interstate Renewable Energy Council (IREC) and several Clean Cities organizations served as sub-contractors on the study. The resulting report, Simplifying Utility Service Connections for Small Fleet and Multi-Family Housing Electric Vehicle Charging, uncovers EV service connection challenges as well as some leading practices for utilities to stay ahead of growing demand and create new opportunities for their service areas. This document provides a literature review of some recent related studies that were published after the EPRI report was issued to provide supplemental information on the EPRI report findings. The review provides a high level summary of the findings of these recent reports on small fleet and multi-family housing electrification.

Download the Final Report Here

Simplifying Utility Service Connections for Small Fleet and Multi-Family Housing Electric Vehicle Charging (https://www.epri.com/research/products/000000003002031384)

Contents

DISCLAIMER: This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Technology Integration/EEMS Office Award Number DE-EE0010632. The views expressed herein do not necessarily represent the views of the U.S. Department of Energy or the United States Government.

Recent Literature on EV Energization for Small Fleets

I. Let's Get Flexible: Considerations for Unlocking Grid Capacity Using Flexible Interconnection

Issuing Organization: Environmental Defense Fund
Authors: Horan, C; Zimmerman, M; Jermyn, C; and Godo-Solo, D
Publication Date: February 2025
Link: https://library.edf.org/AssetLink/q812pd5afr3hboi61cm503fprla5ge0p.pdf

Description: This report defines flexible interconnection as "limiting the amount of peak power drawn from the grid by the fleets' chargers to avoid exceeding the capacity limits of the associated utility side and/or customer-side electrical infrastructure." The report contains practices for flexible interconnection that apply equally well to small and large fleets and other EV service connections. It explores three crucial questions that will need to be answered to build a successful flexible interconnection program.

1. Structure, or how the customer's energy use is limited in practice;
2. Communication, the technologies used to manage the customer's energy limit; and
3. Enforcement, the mechanisms used to dissuade the customer from exceeding the limit.

Key Takeaways

Introduction

- Flexible interconnection can be achieved via (i) hardware, where physical infrastructure is put in place to limit a customer's maximum demand; and/or (ii) software, which relies on digital controls on the customer's load and can adapt power output dependent on the need and/or constraint.
- There is no one-size fits all flexible interconnection solution - programs can be adapted to accommodate any given number of operational, technical, and legal limitations. There are trade-offs and utilities and the customer must determine whether the value they receive in terms of faster energization justifies the potential cost and operational complexity of the system. Other issues, including agreement form and scope, liability, distribution planning, technical requirements, customer-utility engagement, customer compensation, and cost-sharing also need to be addressed.
- Flexible interconnection can benefit fleets by shortening interconnection timelines, benefit ratepayers, and society by facilitating greater end-use electrification and potentially mitigate or delay the need for upstream upgrades.

Static vs. Dynamic Limits

- The first question utilities need to answer for customers is how frequently the customer's maximum allowable demand will change.
- Load limits can be static or dynamic. Static load limits do not change in response to external signals like real-time grid conditions. Dynamic load limits are designed to respond

to load variability depending on the utilities' forecasting ability which may range from seasonal changes to day-ahead forecasts to real-time grid conditions.

- Static limits are the simplest option and may be best suited for utilities without a lot of visibility into their systems and may also suit situations where utilities are building upstream upgrades to meet new electric load demand and the flexible interconnection is an interim, bridge-to-wires solution.
- Dynamic limits are a more sophisticated and best suit utilities with greater visibility into their distribution systems, such as those with some form of a distributed energy resource management system, and those that have established granular hosting capacity analyses and forecasting methods. Dynamic limits may require some investment but can yield significant benefits by unlocking grid capacity and increasing system efficiency and optimization.

Communications Interface

- The communication interface between the customer and the utility, whether autonomous or communications-based, will largely determine the bounds of a flexible interconnection's sophistication.
- Static autonomous limits can be set it and forget it, but the more complex the structure of the flexible interconnection, the more likely that the customer will need communications-based Load Control Management System (LCMS) to relay signals about changing limits between the utility and the customer.
- As utilities move forward, they should also consider how a potential communications-based LCMS might integrate with future vehicle-grid integration programs, including managed charging and vehicle-to-grid programs.
- Communication protocols and the hardware solutions that accompany them are a complex, evolving field with little consensus among utilities or regulators regarding operational and technical LCMS standards. Additional utility pilots would be beneficial to determine which combinations are most useful and cost-effective.

Enforcing the Load Limit

- If there is a lack of enforcement when customers exceed their limits, then utilities may not be able to rely on them to consistently operate within grid constraints. On the other hand, if penalties are excessively harsh, customers may be deterred from engaging in a program at all.
- Load limits can be "hard caps" or "soft caps". Under a hard cap, the upper load limit cannot be exceeded without enforcement action by the utility. Under a soft cap, the customer could be allowed to exceed the cap under certain conditions subject to disincentives.
- The report presents a useful table comparing possible flexible interconnection structures, use cases, and suitability criteria.

Conclusions

- Understanding the implications surrounding the structure of the load limit, the choice of static or dynamic options, the communications protocol between utility and customer (load), and enforcement mechanism will help stakeholders begin to design and test working programs.

II. Proactive Outreach by Utilities Can Help Jumpstart Fleet Electrification

Issuing Organization: American Council for an Energy Efficient Economy
Author: Daivie Ghosh
Publication Date: May 2025
Link: www.aceee.org/blog-post/2025/05/proactive-outreach-utilities-can-help-jumpstart-fleet-electrification

Description: Daivie Ghosh is the Transportation Senior Research Analyst for the American Council for Energy Efficient Economy. (ACEEE) conducts transportation research for the greenhouse gas emissions impact of vehicle technologies and policies. This blog post explores how proactive engagement from utilities can help fleet operators navigate the transition to electric vehicles, cutting operating costs and pollution. Informed by a SEPA case study for DTE Energy the report outlines four steps on how utilities can connect with fleet operators about electrification.

Key Takeaways

- Ninety percent of vehicle fleets consist of fewer than 100 vehicles, and mid-size fleet operators often lack the know-how and resources of the largest companies to transition to electrification. Utilities are uniquely positioned to help more fleet operators, especially those with smaller fleets, as they begin to move to EVs.
- The blog outlines four steps for utilities to connect with fleet operators about electrification.
    1. Analyze Data: Utilities can purchase and analyze data on operational patterns, fuel consumption, mileage, and other relevant factors for local fleets to identify potential electrification candidates in their service territories.
    2. Proactively Engage: Utilities should proactively pursue engagement with fleet managers before they may have even begun considering electrification, helping familiarize the fleet managers with baseline knowledge of electric fleets. This outreach can take various forms such as resources on its website, organizing regular meetings for fleet customers, or individual communication.
    3. Provide Technical Support: Utilities can assist fleet operators with technical and financial assessments such as total cost of ownership calculations, assessing charging infrastructure requirements, upfront costs, and grid impacts. This helps fleet operators learn about the costs and infrastructure considerations of electrifying fleets directly from experts.
    4. Tailor the Level of Engagement: Utilities can tailor the level of support they offer based on the fleet operator's familiarity with electrification.
- Fleets derive value from utility proactive outreach as exemplified by ConEd's engagement with NYC School Bus Umbrella Services (NYCSBUS), a non-profit that manages and

operates school buses in New York City. ConEd support enabled NYCSBUS to use load management strategies to satisfy the existing electric bus fleets power needs while supporting further electrification through participation in the utility's SmartCharge Commercial program and leveraging make-ready incentives.

- Advisory support bolstered by incentives brings more electric fleets online. Programs such as Southern California Edison and San Diego Gas & Electric "make-ready" programs which include applications support and ongoing assistance through permitting, design, and construction phases of the project have brought at least 2,500 electric fleet vehicles online in California.
- Successful fleet electrification is a multi-step process, and proactive utility support, with dedicated staff (single point of contact) or a FAS type service, can make the transition smoother for both fleet operators and utilities.

III. Shared Charging Hubs for Medium- and Heavy-Duty Electric Vehicles

Issuing Organization: American Council for an Energy Efficient Economy
Publication Date: September 2025
Link: www.aceee.org/sites/default/files/pdfs/shared_charging_hubs_for_medium-_and_heavy-duty_electric_vehicles.pdf

Description: Shared charging hubs are a growing charging solution for electric trucks and other medium- and heavy-duty (MDHD) fleet vehicles across the country. This topic brief from ACEEE outlines planning and siting considerations for developing shared charging hubs and provides recommendations for how utilities can improve coordination with shared charging hub developers. The brief was informed by interviews with four charging hub companies which were left anonymous for purposes of the report. It covers shared charging hub business models, key planning considerations, and recommendations for utilities.

Key Takeaways

Benefits of Shared Charging Hubs

- Shared charging hubs are typically planned and constructed by third-party developers who manage and own the site. Thes sites are typically semi-public, with the hub developers making chargers available for use by any fleet (i.e., multi-tenant), either through a reservation system or on a contractual basis.
- This approach can address a range of challenges for fleet operators including high up-front costs for charger installations, lack of experience setting up and managing EV charging, low charger utilization, and issues of route accessibility, port availability, and cost for public charging sites.
- This charging solution, which may also be referred to as Charging as a Service (CaaS), is gaining traction across the country. According to CALSTART's National Medium & Heavy Duty Zero-Emission Infrastructure map, there are now 24 shared and semi-public charging stations for MDHD vehicles with 284 ports open, and 406 ports either in development or in the pre-construction phase.

Shared Charging Hub Business Models

- Two options for shared charging discussed – a contract-based model and a reservation model.
- Contract-based models are most common among interviewed companies and typically guarantee a certain level of service for customers over a period of time (e.g., monthly or annually), with such service often being customized to the individual needs of the customer. In addition to providing charger access, some developers also offer complete turnkey services including access to the EV (a benefit to fleets interested in testing EVs without purchasing them).
- Reservation models utilize fully publicly accessible locations where fleet drivers and managers can reserve spots at and pay through an online mobile phone application, or fleets can pay for charging sessions as available without a reservation.

Key Planning Considerations for Shared Hubs

- Siting: Shared charging companies generally need around 2–2.5 acres of land for an average site. Developers will look for sites in hot spots with a high concentration of fleets or areas with heavy truck traffic, such as sites near ports, industrial warehouses, and distribution centers that are logistically convenient. These locations also offer access to prospective anchor tenants which some companies require before investing in site development.
- Power Needs: The amount of power required at a shared charging hub can vary from a few stalls (e.g., 4–8 chargers) to a larger multi-stall operation with over 80 ports primarily utilizing DCFC chargers. Developers are looking to build hubs with power demand anywhere between 3–30 MW, with most reporting they plan to start on the lower end of power demand, in the 3–7 MW range and gradually ramp up to the full planned capacity of around 15–30 MW. All the companies mentioned that utilization rates are expected to be low in the initial years and gradually increase.
- Utility & Market Considerations: Developers will look at local grid capacity hosting maps if available to determine whether there is enough capacity. Granular circuit-level data is generally ideal to help determine available capacity. Developers prefer siting their projects in areas with state-level and/or utility make-ready incentives, grants, and voucher programs, and in places with favorable rate designs.

Interviewee Recommendations for Utilities

- Communication and Processes
    - Have a dedicated utility business development team.
    - Clearly lay out what is required of customers such as a list of design requirements or a checklist of to-do items that utilities need from developers at each stage so that developers know all the requirements up-front.
    - Provide guides on cost estimates for utility-related infrastructure necessary for upgrades, energization and process timelines, and step-by-step processes.
    - Make regularly updated grid/hosting capacity maps publicly available at the circuit level, enabling developers to efficiently investigate potential sites.

    - Speed up energization timelines so that customers do not lose out on available capacity to other candidates.
- Program Design
    - Utility-side incentives and other make-ready programs can be helpful in reducing the cost of a shared charging hub, but burdensome processes and paperwork can discourage utilization.
    - One company noted that the public accessibility requirement for make-ready does not support all shared charging hub models given the potential risk that vehicle drivers will not have guaranteed access to chargers.
    - Some developers prefer to be in charge of designing the "behind-the-meter infrastructure" at a site and maintaining infrastructure ownership. As a result, make-ready programs that offer the option for customers to design, build, and operate behind-the-meter infrastructure can be helpful.
    - Although not directly tied to utility programs, two companies mentioned that they saw value in proactive grid planning and investment by utilities as a way to ensure necessary grid infrastructure in the future.
    - Additional input included a focus on future-proofing sites by enabling phased buildouts through incentives for innovative solutions such as mobile batteries and other interim power sources as well as transparency on how incentive and rebate amounts are calculated in utility programs can help developers factor these into their economic analyses.
- Demand Charges and Rates
    - Utilities should consider a combination of EV-specific rates to mitigate demand charges, introducing time-of-use electricity rates for MDHD fleets, and/or instituting temporary demand charge holidays until charger utilization reaches sufficient volume and predictability.
- Flexible Interconnection
    - The potential for flexible interconnection options to energize and activate a site may not always be clear. Utilities should be prepared to talk through a full suite of options with developers early in the process to help them understand the energization and interconnection options available.
    - One company noted that static utility load programs offer more operational predictability to shared charging hubs given that they need to ensure charger availability.

IV. Optimizing Grid Infrastructure and Proactive Planning to Support Load Growth and Public Policy Goals

Issuing Organization: Brattle Group for the Clean Air Task Force (CATF)
Authors: Pfeifenberger, J; Lam, L; Graham, K; Northup, N; Hledik, R
Publication Date: July 2025
Link: www.catf.us/wp-content/uploads/2025/07/grid-utilization-planning.pdf

Description: This whitepaper was prepared for Clean Air Task Force (CATF) by The Brattle Group. Using case studies, the paper highlights effective solutions to address challenges posed by historic levels of new power demand and how they have been implemented across the industry. The paper offers actionable recommendations for regulators, system planners, utilities, and other key stakeholders to navigate obstacles related to supply, interconnection, cost, and environmental policy in the evolving power sector. This whitepaper is a comprehensive and general assessment of grid optimization and planning and not specifically focused on (but applicable to) the electrification of small fleets and multi-family housing. This summary focuses material and recommendations most clearly related to EV activity.

Key Takeaways

Introduction

- The combination of data center developments, onshoring of manufacturing facilities, and electrification of transportation, home heating, and other energy end uses has exerted enormous pressure on the electricity system. Projected rapid load growth associated with these developments means that the country's electricity grid will have to expand at more than five times the pace of the past two decades.
- Addressing this demand faces several challenges.
    - Load growth uncertainty
    - Resource adequacy concerns
    - Delays and rising costs caused by supply chain constraints
    - Backlogged generator interconnection processes
    - Unrealized end-use efficiencies
    - Environmental challenges

Strategies Addressed

1. Maximizing the value of the existing grid through (i.) maximizing participation of distributed and demand-side resources and participation in enhanced rate options (e.g., managed EV charging and other load flexibility); (ii) broadening the deployment of technology, and (iii) taking advantage of grid "upsizing" opportunities during refurbishment.
2. Cost-effectively accelerate the grid connection of new loads and resources by facilitating customer-sponsored generation investments and minimizing the need for transmission upgrades and generation investments by facilitating co-location of generation and load in "energy parks" and streamlining generator interconnection processes.
3. Implement proactive planning and procurement processes to identify flexible, least-regrets solutions and, where necessary, attract new investments in a timely manner.
4. Introduce targeted affordability measures

Maximizing the Value of the Existing Power System

- Maximize participation of distributed and demand side resources
    - State Commissions and utilities should consider scaling up promising demand-side programs, partnering with third-party vendors and aggregators and providing

targeted incentives for demand-side resource programs, particularly to low-income and vulnerable customers.
    - To better leverage demand-side resources and provide much-needed capacity at low incremental cost to the system, utilities can immediately begin to more broadly deploy permanent demand-side programs, particularly where sufficient commercial experience already exists.
    - To take advantage of demand-side resources more quickly and on a larger scale, utilities could partner with third-party DR aggregators through competitive procurement of grid services.
- Maximize participation in enhanced rate options
    - Utilities should consider (and Commissions should consider requiring) expanded rate offerings that provide customers with price signals that reflect system conditions more accurately while accounting for customer preferences.
    - Utilities should review and consider enhancing and expanding their rate offerings to provide customer choice while leveraging customer-side resources to meet evolving system needs.
    - For customers prioritizing convenience, opt-in subscription pricing rates could offer them a fixed monthly payment regardless of how much electricity they use, with the fixed amount being determined by the customer's historical usage.
    - An opt-in peak-demand-based rate, potentially coupled with a time-varying rate, could help promote usage patterns that alleviate constraints on the distribution system and provide price signals for automated DSM programs to shift load.

<u>Implement Proactive Planning and Procurement Processes</u>

- Broaden deployment of grid-enhancing and advanced transmission technologies, remedial action schemes, and advanced conductors
    - Transmission planners should promote the use of grid-enhancing technologies (GETs), high-performance conductors (HPCs) and other advanced transmission technologies (ATTs), Remedial Action Schemes (RASs), and more quickly expand existing grid capacity (including interties with neighboring regions); address near- and medium-term reliability needs, mitigate grid congestion; and avoid uneconomic curtailment of renewable generation.
- Cost-Effectively Accelerate Grid Connection of New Loads
    - Facilitate customer-sponsored generation investments and procurements to maintain resource adequacy.
    - Minimize the need for transmission upgrades by facilitating co-location of new generation and load in "energy parks."
- Implement Proactive Planning and Procurement Processes to Accelerate the Necessary Investments
    - Generation and transmission planning processes can be enhanced by enacting proactive, scenario-based planning practices that allow for the identification of more flexible, cost-effective generation and transmission solutions.

- Distribution system investments should be designed to cost-effectively manage load growth (and capitalize on the load flexibility of distribution-level resources).
- Scenario-based planning that facilitates the prebuilding of projects in constrained parts of the grid can result in ratepayer savings while still serving growing electricity demand.
- Preliminary results from Brattle's work on this topic (not yet public) indicate that proactive distribution system planning, aided with granular, bottom-up load forecasting and anticipatory distribution infrastructure upgrades, can lead to net savings to ratepayers and help meet increasing demand from the electrification of industrial, commercial building, and transportation sectors.
- More locationally and temporally granular load forecasts will be critical, supported by advanced adoption models that incorporate both traditional variables—such as costs, policies, and customer preferences with load profiles—and variables that are specific to different load types (e.g., vehicle type, charging technology characteristics, vehicle fleet electrification trends) across different scenarios
- The report recommends that key stakeholders such as utilities and system operators identify and share best practices for conducting load forecasts.
- Key elements of the service connection process should include clearly defined queue protocols, robust financial and commercial readiness criteria and requirements, a clear distinction between interconnecting firm and interruptible new loads (including those with co-located generation that is dispatchable for grid needs), and mechanisms to remove non-viable projects from the queue.

<u>Improve Existing Load Interconnection Processes in line with Policy Objectives</u>

- Key stakeholders should standardize interconnection processes to reduce load growth uncertainty and enhance planning efficiency. Interconnection processes and rate structures should be revised to reflect economic and energy policy objectives, and economic development rates should be reserved for strategically relevant, high-value, and price-sensitive loads.
- Many existing processes operate on a "first-come, first-served" basis, which enables speculative behavior and can inflate load forecasts with non-viable phantom projects. A consistent, transparent, and actively managed load interconnection process would help mitigate these risks and support more effective system planning.
- In areas with increasing resource constraints and high incremental system costs, both the interconnection process and applicable rate structure should reflect the contributions that large new loads make to state or regional policy objectives, including environmental, employment, economic development, and technical grid impacts.

<u>Introduce Targeted Affordability Measures</u>

- Energy efficiency and conservation programs can provide targeted, meaningful support for low-income and vulnerable customers while reducing systemwide electricity consumption.

Recent Literature on EV Energization for Multi-Family Housing

I. Expanding EV Charging in Multifamily Affordable Housing: Insights and Strategies

Issuing Organization: American Council for an Energy Efficient Economy
Author: Grace Lewallen and Peter Huether
Publication Date: May 2025
Link: www.aceee.org/sites/default/files/pdfs/t2501.pdf

Description: This research report identifies financial and non-financial factors that influence EV charger installation in affordable multifamily properties at the time of initial construction. ACEEE held ten interviews with owner-developers and developers of affordable housing buildings with experience installing EV chargers during new construction. The report describes the decision-making processes within affordable multifamily housing development and management addressing four key areas 1) Partnerships, 2) Knowledge Gaps and Perceptions, 3) Codes and Regulations, and 4) Funding.

Key Takeaways

Barriers to EV Charging in Affordable Multifamily Housing

- ACEEE found that retrofitting EV charging infrastructure into existing buildings can cost three to four times more than installing it during construction of a new building, with some estimates suggesting these costs could be up to ten times higher.
- In addition to this high cost (especially when wiring upgrades and reconstruction are needed), several other factors act as barriers to adding EV charging to existing buildings, including more load on the electrical system, challenges in reaching agreements among residents and other stakeholders, and disruptions to existing parking management and allocation of parking spaces.

Partnerships

- Partners are key catalysts for EV (electric vehicle) charger installation in multifamily affordable housing, often suggesting the idea to affordable housing developers. These collaborations with external stakeholders, such as utilities, car-sharing programs, charging providers, and sustainability-focused organizations, often significantly ease the financial and logistical challenges of EV charger installation and management.

Knowledge Gaps and Perceptions

- Affordable housing developers often lack crucial early-stage information and experience with EV infrastructure, leading to missed opportunities and insufficient planning for core operational and financial considerations.
- While the MFAH housing developers the Authors interviewed have diverse motivations, rationales, and programmatic contexts for installing EV chargers, they generally see three main benefits to adopting this infrastructure: providing tangible mobility benefits for tenants, future-proofing buildings, and avoiding costly retrofits.

- The interviews suggest that decisions to install EV chargers are driven more by perceptions of tenant needs and long-term strategic planning than the possibility of financial returns. In contrast to other EVSE providers in the private sector, developers of MFAH do not generally view EV chargers as profit-generating assets in affordable housing contexts.

Codes and Regulations

- According to the EV Charging for All Coalition, building codes that require a certain level of preparedness or installation for EV charging in newly constructed buildings have been adopted in 16 states plus Washington, DC and in many more cities in states without statewide requirements like Atlanta, Minneapolis, and Dallas.

Funding

- Financial incentives for EV charging upgrades and installations at existing buildings do exist as well, funded by taxpayers in some states and by many utilities through ratepayer funding.
- Public or utility EV charging investment in affordable housing has been minimal, particularly when compared to the investment in publicly accessible charging stations. Outside of California, only a few pilot projects currently subsidize EV charging infrastructure in multifamily affordable housing developments.
- Funding opportunities are not as appealing as they could be. Developers are more likely to apply for funding opportunities that offer larger incentives and require less effort to access.

Recommendations

- Efforts to integrate EV charging infrastructure into affordable multifamily housing (MFAH) are essential for expanding access to clean transportation and promoting equity in the transition to electrified mobility.
- Utilities need to provide clear guidance during planning stages, well before construction begins. Timely and transparent utility engagement is necessary so that developers have the information needed to efficiently plan and implement EV infrastructure.
  The role of early utility engagement and partnership collaborations, including car-sharing initiatives, emerged as pivotal solutions for overcoming common obstacles to adopting EV charging infrastructure.

II. Electric Vehicle Charging for Multifamily Properties

Issuing Organization: Clean Fuels Michigan and The Michigan Clean Fuels Institute
Publication Date: January 2025
Link: www.cleanfuelsmichigan.org/wp-content/uploads/2025/04/Electric-Vehicle-Charging-for-Multifamily-Properties.pdf

Description: This report was developed to support at-home charging opportunities within the state of Michigan. The state (MI) has set an ambitious goal of deploying 100,000 EV chargers by 2030 to support growing EV adoption and create a robust charging network. A significant portion of Michigan's population, about 1 in 4 people, live in some type of multifamily housing. This guide is intended to provide information specifically for property owners, managers, and related

organizations like homeowners' associations interested in installing EV chargers for their residents. The report provides an overview of benefits, available incentives, charging technology and considerations, as well as business models. The report also includes case studies and an installation checklist.

Key Takeaways

Benefits

- For EV drivers, access to charging is a deciding factor when choosing where to live, positioning it as a must-have amenity for multifamily properties. Charging availability plays a significant role in influencing tenant decisions, with surveys showing that 58% of renters would be willing to pay more in rent for access to charging.

Incentives

- State, federal, and utility incentives are available to help offset the costs of deploying EV charging infrastructure. Report discusses various grant and incentive programs, such as Michigan's Clean Fuel and Charging Infrastructure Program which makes grants available to support the deployment of Level 2 charging stations at existing multifamily housing properties, federal 30C tax credits, and utility incentive programs.

Charging Technology and Considerations

- When choosing charging infrastructure, the developer should consider the following: networking capabilities, theft deterrence, output power rating (measured in kilowatts), number and type of connectors, simultaneous charging capacity, and operation and maintenance needs (such as payment processing and data collection).
- Software features to consider include energy management, billing integration, and tenant access, reservation systems for charging in a parking space, start or stop charging sessions, and view usage history.
- The report recommends that charging hardware should be compatible with Open Charge Point Protocol (OCPP) version 1.6 or higher, which provides added flexibility for charger owners and helps to avoid stranded assets, ensuring the equipment remains functional if it switches to a new service provider.
- The report urges consideration of future-proofing the EV charging infrastructure, namely engaging in proactive planning to minimize future costs as demand for charging increases. Future proofing includes such measures as installing extra conduit when trench digging, upgrading building systems to handle additional charging later, or adding service to parking areas.
- Moreover, the layout and placement of charging stations should be carefully considered based on factors like how the building's units are metered and how parking spaces are assigned. Whether parking spots are assigned and the placement of electric meters can significantly affect where chargers should be placed.

Business Models

- Possible revenue sources/models include:

- Pay-Per-Use: Users pay a fee based on energy consumed, time spent charging, or a flat session fee. Some sites will offer lower costs on nights and weekends if utilizing a time of use rate.
- Membership Model: Tenants pay a recurring monthly or annual fee for access to chargers for unlimited use.
- Integrate with Parking Rent: EV charging costs are bundled into the tenant's parking rent.
- Leasing Revenue: The property leases parking spaces or charging equipment to a third-party operator who is an EV service provider, who procures, installs and manages the operation of the chargers.
- Retail Sales Revenue Sharing Agreements: The property partners with a charging network provider to share revenue from public charger use.

Case Studies and FAQs

- Several case studies of MFH properties in Michigan are presented along with frequently asked questions for developers about the owning and operation of charging.

III. Policy-Based Solutions to Increase EV Charging Access for Multifamily Housing Residents Blog Post

Issuing Organization: Drive Electric Minnesota
Author: Alejandro Nakpil
Publication Date: July 2025
Link: driveelectricmn.org/policy-based-solutions-to-increase-ev-charging-access-for-multifamily-housing-residents/

Description: Minnesota's Climate Action Framework sets a target for 20 percent of light-duty vehicles (LDVs) on the road to be electric by 2030, while the Minnesota Department of Transportation (MnDOT) aims for 65 percent of LDVs in the state to be electric by 2040. Achieving these goals is critical to reducing the state's greenhouse gas emissions, improving its air quality, and increasing access to low and zero-emission transportation options for its residents. This blog explores the challenges of expanding EV charging at multifamily housing and outlines policy solutions that can help ensure all Minnesotans can benefit from transportation electrification.

Key Takeaways

Equity Considerations

- Addressing the barriers to installing charging at and near multifamily housing is a critical issue. With 24.8 percent of existing housing units classified as multifamily housing and 28 percent of all households being renters in Minnesota, it will be difficult for the state to equitably reach its climate goals and ensure their benefits extend to all without increasing access to EV charging for residents in multifamily housing.

Challenges of EV Charging at Multifamily Housing

- The installation of charging at multifamily housing has been lower than that of single-family homes due to the following barriers and challenges:
    - Limited electrical capacity in existing multi-family buildings, which are older and have aging infrastructure.
    - High costs for upgrading electrical systems and retrofitting buildings with EV charging.
    - Tenant and landlord coordination issues, particularly around approval and costs.
    - Lack of dedicated parking or assigned spaces for EV charging.
    - Complexity in metering and billing for shared electricity usage.
    - Regulatory and policy barriers, such as zoning and easements, and homeowners' association (HOA) restrictions.

<u>EV Policy Solutions</u>

- The report states there are a variety of policy-based options available to increase access to EV charging for multifamily housing residents. They include the following legislative and regulatory options:
    - EV-ready building codes for new and renovated multifamily housing (also known as EV-ready ordinances)
    - Potential right-to-charge legislation
    - Adopting a clean transportation standard
    - Financial incentives

<u>Equity-centered Multifamily Housing Codes</u>

- The report cites eight states—California, Colorado, Delaware, Illinois, Maryland, New Jersey, Oregon, and Washington—that currently have construction codes that require some level(s) of EV charging infrastructure to be installed at a specified number or proportion of parking spots to support a minimum of level 2 charging at new and renovated multifamily housing.

<u>Right-to-Charge Laws</u>

- Right-to-charge laws ensure that residents of multifamily housing have the legal right to install EV charging infrastructure that can support level 2 or level 1 chargers, addressing a significant barrier to EV adoption for those without direct control over their property. Eleven states—California, Colorado, Connecticut, Florida, Hawaii, Illinois, New Jersey, Oregon, Virginia, and Washington—currently have right-to-charge laws.

<u>Financial Incentives</u>

- Financial incentives, such as grants, rebates, and tax credits, can play a pivotal role in overcoming the cost barriers associated with installing EV charging infrastructure at and near multifamily housing.
- By implementing statewide strategies like equity-centered multifamily housing codes, right-to-charge laws, and adopting a clean transportation standard alongside expanding financial incentives, the report concludes that Minnesota can increase access to EV charging infrastructure for residents in multifamily housing and accelerate EV adoption.