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Researching Best National Practices in EV Charging

This semester, I researched the best national practices of electric vehicle (EV) charging in different countries around the globe. The main piece of literature I used for my analysis was the International Energy Agency's Global EV Outlook 2024¹. The report focuses on EV charging

infrastructure as well as both light-duty ⁴⁵ and heavy-duty vehicles. The report ⁴⁰ highlights that home charging remains ³⁵ the most common for EV owners², ³⁰ especially in suburban and rural areas ²⁵ where access to parking is higher than ²⁰ in urban areas. For example, Korea is ¹⁵ one of the most densely populated ¹⁰ countries in the world³, and they ⁴⁵ depend on urban charging almost ⁶⁰ entirely in cities like Seoul. However, ⁶⁰ access to these home chargers varies ⁶⁰ greatly by country. For example,



Norway has over 90% EV sales and about 82% charge at home⁴, whereas India only reports 55% of private chargers at home due to infrastructure limitations⁵.

The main challenges that exist are balancing EV deployment with the current capacity of the electrical grid, ensuring charging availability in developing countries, and managing energy

¹ IEA (2024), Global EV Outlook 2024

² IEA (2024), 67, Figure 1

³ The World Bank Group, 2022

⁴ LCP Powering Possibility, 2023

⁵ McKinsey & Group, 2023

storage through smart, at-home charging. This has been evident by governments shifting from EV subsidies to infrastructure investments.

Policies to Promote Residential Charging

The United Kingdom (UK) and European Union (EU) are two areas that have already implemented policies to address the growing amount of electric vehicle charging infrastructure. These two policies particularly focus on accessibility, coverage, and public adoption. They also both reflect the carbon-neutral commitment within the transportation sector of both countries.

In the UK, the Electric Vehicle Chargepoint Grant for Households with On-Street Parking⁶ aims to provide financial support for installing EV chargers where off-street parking is not available. This policy is geared toward individuals in urban areas with no private driveways and covers up to 75% of the cost (up to £350) for eligible installations and approved suppliers. It also focuses on enhancing residential access to charging infrastructure, particularly for urban EV users who are often underserved. By reducing cost for home charging, the UK government aims to encourage EV adoption while also addressing regional inequities in infrastructure availability. However, the program remains dependent on household demand and the availability of suppliers to meet growing needs.

In contrast, the EU's Alternative Fuels Infrastructure Regulation (AFIR)⁷ takes a more broad and systematic approach. AFIR was approved in 2023 and mandates the installation of public chargers along major transport corridors. By 2025, the EU requires at least 1.3 kW of publicly accessible chargers per registered battery electric vehicle (BEV), signaling a commitment to widespread infrastructure.⁸ The regulation prioritizes coverage and operation at a continental scale, ensuring consistent electric vehicle supply equipment across all member states. Unlike the UK's i grant, AFIR provides a regulatory framework to help infrastructure keep pace with rising EV adoption.

⁶ Electric Vehicle Chargepoint Grant for Households with On-Street Parking, gov.uk, 2024

⁷ The European Commision, 2023

⁸ The European Commision, 2023

How Can the US Improve

The United States can take important steps to improve accessibility for private EV chargers in homes, addressing barriers through policy, awareness, and practical solutions.

One significant step is the implementation of national uniform building codes that address EV infrastructure. Currently, building codes vary by state and municipality, which creates inconsistencies in new and existing homes when it comes to readiness to charge an EV. A standardized national code could require that all new residential construction include pre-wiring or infrastructure for EV chargers, particularly Level 2 chargers, which are efficient for at-home use. Retrofitting homes later for EV charger installation is costly; proactive measures during construction would lower installation costs and increase adoption. This national approach ensures the option for EV ownership regardless of location or facilitates.

Improving public awareness about incentives and increasing accessibility is also critical. Federal, state, and local governments offer various rebates, tax credits, and grants for EV charger installations. However, many homeowners remain unaware of these opportunities, or they find the application processes complicated and discouraging. A coordinated education campaign can help inform homeowners about the benefits of installing EV chargers, while governments can reform and renew rebate applications. Clear, easy-to-understand guidelines and outreach programs supported through utility companies and dealerships can encourage more widespread adoption.

Finally, installing chargers in multi-family residences presents unique challenges that require targeted solutions. Many multi-dwelling units (MDUs), like apartment complexes and condominiums, do not have the infrastructure to accommodate private chargers, leaving residents without access to convenient at-home charging. To address this, policies could incentivize residents to install shared or individual EV chargers, with financial support or grants specifically for MDUs. Additionally, building codes for MDUs should include requirements for EV-ready infrastructure during new construction or major renovations. These steps would ensure equitable access for renters and condo owners, who face disproportionate barriers compared to single-family homeowners.

Sources

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