Instant Insight

The Charging Divide

How Public Rates and Private Charging Access Shape EV Cost

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Key Points

- Major electric vehicle charging operators in Saudi Arabia have shifted from free to paid models, significantly altering the economic landscape for early adopters.
- Higher public charging prices have increased EV operating costs, creating a financial disparity between drivers with access to low-cost residential charging and those dependent on public charging.
- Fewer than half of households can install a home EV charger, meaning many apartment residents must rely on higher-priced public charging, which translates into a 6% total cost of ownership premium for drivers unable to charge at home.
- To maintain EV adoption momentum, improved access to charging frameworks and updates to building codes are essential. Expanding affordable Level 2 charging in communities, workplaces, and commercial areas can narrow the cost divide.
- EV manufacturers can further help bridge this gap by directly investing in accessible charging solutions.

Keywords: Electric Vehicles, Saudi Arabia, Total Cost of Ownership, Charging Divide, Public Charging, House Typology, Residential Charging Access, EV Infrastructure, Charging Tariffs, Building Codes

Introduction

01

Saudi Arabia's electric vehicle market has entered a new phase. What began as an early-adoption strategy supported by free public charging has shifted toward a priced charging ecosystem. Between June and December 2025, major operators introduced tariffs of approximately SAR 0.65 per kWh for AC public charging (Level 2) and SAR 0.99 per kWh for DC fast charging (Level 3) (EVIQ 2025; Zawya 2025).

With residential electricity typically priced between SAR 0.18 and SAR 0.30 per kWh, depending on consumption brackets, public charging can be up to four times more expensive than charging at home. Consequently, electric vehicle running costs are increasingly determined by where charging occurs, which in turn depends on whether a household can feasibly install a private home charger.

Unlike petrol, where pump prices are typically uniform, EV charging costs significantly vary based on the source of power. While home charging is billed at lower residential tariffs through the Saudi Electric Company, public operators must set higher prices to cover commercial energy rates and infrastructure costs. This disparity makes access to home charging a central determinant of EV affordability.

By how much will transitioning from free to paid public charging affect the total cost of ownership (TCO) of EVs in Saudi Arabia? How will it affect households with private home charging access compared with those dependent on public charging infrastructure? By evaluating residential electricity rates against new public tariffs, this analysis shows how housing typology influences EV affordability and suggests policy interventions to address the resulting charging divide.

Housing Typology and EV Total Cost of Ownership

02

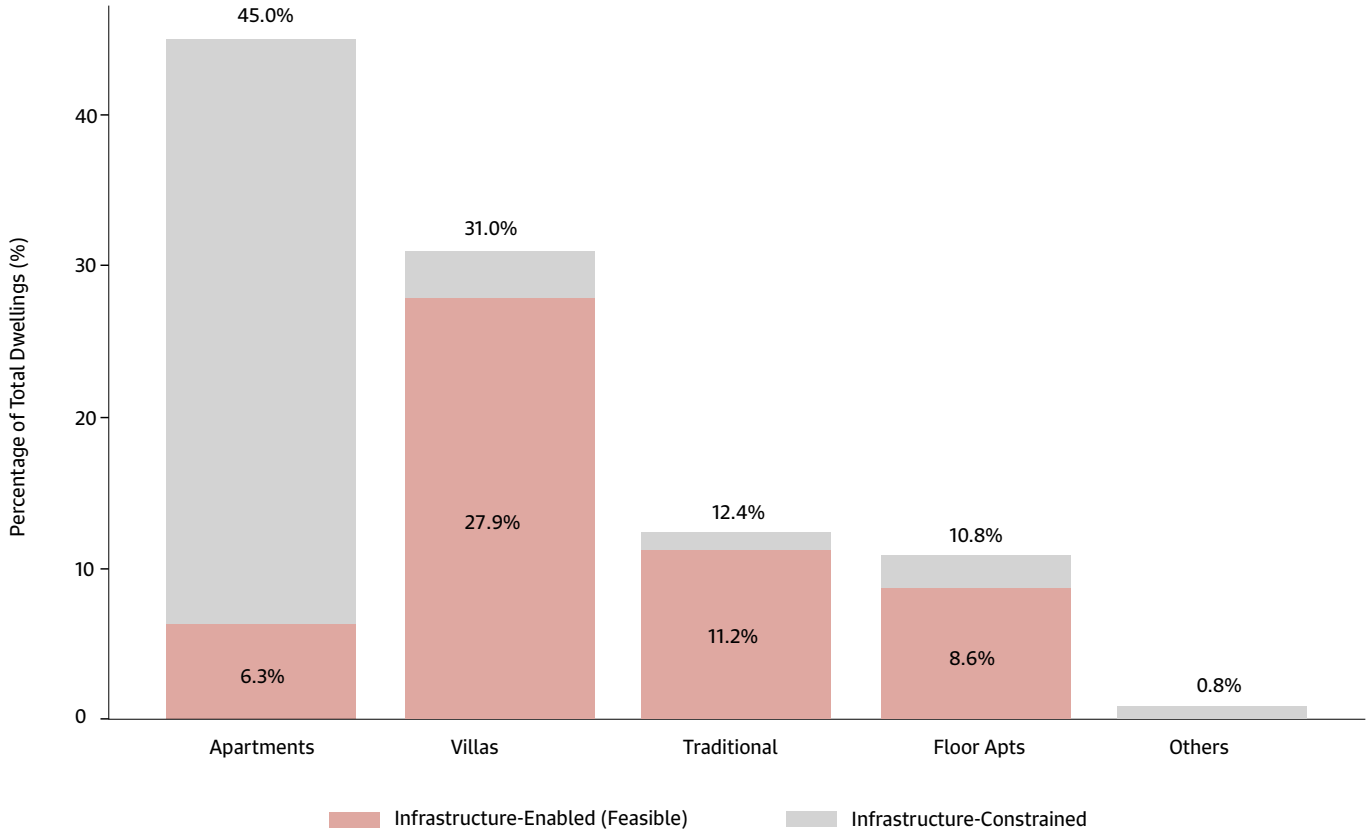
To evaluate the impact of public charging tariffs on EV TCO, this analysis accounts for housing typology in Saudi Arabia. Access to residential charging is largely dictated by housing typology, creating a distinct divide in the economic feasibility of EV adoption. According to the Housing Statistics Bulletin 2024 (GASTAT 2024), apartments constitute the largest share of dwellings at 45.0%, followed by villas at 31.0%, traditional houses at 12.4%, and floor apartments at 10.8% (GASTAT 2024).

We classify 54% of the total housing stock as charger-enabled, where private installation is technically feasible (Figure 1). This classification is supported by the structural autonomy of villas and traditional houses, which typically feature independent electrical meters and private garages, facilitating residential charging with minimal technical friction (Krarti, Aldubyan, and Williams 2020).

These structural advantages are complemented by a strengthening regulatory framework that ensures new housing stock is equipped for charger installation. Specifically, new developments must comply with the Saudi Electrical Code (SBC 401), which was updated in 2022 to include mandatory requirements for EV charger installations in residential buildings.

These technical standards are reinforced by Ministry of Municipalities and Housing guidelines, which mandated that 5% of parking spaces in new residential and commercial developments be allocated for EV charging (MOMRAH 2020). As a result, the remaining 46% of the housing market is classified as infrastructure-constrained, consisting primarily of standard apartments where structural or regulatory barriers necessitate a total reliance on higher-cost public charging.

Figure 1. Saudi housing typology and EV charging feasibility (2024).



Source: GASTAT Housing Bulletin (2024) and author's calculations.

The TCO calculation breakdown in Table 1 indicates that EV ownership costs are driven primarily by purchase and financing costs, including upfront price and payment structure, as well as maintenance and repair, which include a one-time battery replacement. Energy costs are lower when charging is available at home or provided free of charge but increase under paid public charging. Resale values are lower for EVs than for internal combustion engine (ICE) vehicles.

Table 1 shows that EVs maintain a TCO that is 23% to 35% higher than ICE vehicles, depending on charging access and pricing. For example, the premium is lower when a larger share of charging occurs at home or is free and higher when reliance on paid public charging increases. Notably, when public charging was free, households with home charging access faced slightly higher ownership costs. However, with the transition to paid public charging, this dynamic has reversed: households with home access would pay less than their public-dependent counterparts, who face a 6% TCO markup.

Table 1. 10-year NPV TCO for ICEV and EV charging access scenarios.

	Status quo	Free public charging		Paid public charging		Note and source
	Public re-fuel	Home installed and public charger	Only public	Home installed and public charger	Only public	
Vehicle type	**ICE**	**EV**	**EV**	**EV**	**EV**	
	SAR	**SAR**	**SAR**	**SAR**	**SAR**	
Maintenance and repair	24,500	47,800	47,800	47,800	47,800	• Including one-time battery replacement for EVs
	7,300	7,300	7,300	7,300	7,300	• Third party with zero claims
Vehicle fees	1,400	1,400	1,400	1,400	1,400	• Total annual vehicle registration fee
Energy cost – public	59,700	0	0	11,200	49,100	• For ICE fuels: SAR 2.18 per liter • For private charging EV: SAR 0.24per kWh • For public charging EV: L2, SAR 0.65 per kWh; L3, SAR 0.99 per kWh
Energy cost – private	0	7,100	0	13,100	0	
Upfront cost	58,800	82,000	82,000	82,000	82,000	• Authors estimation on Saudi banks interest rates
Balloon payment	44,100	58,800	58,800	58,800	58,800	
Monthly payments	123,100	172,500	172,500	172,500	172,500	
Financing	36,300	40,000	40,000	40,000	40,000	
Resale value	-29,300	-17,600	-17,600	-17,600	-17,600	• Based on Rush, Zhou, and Gohlke (2022)
Charger split	N/A	• 80% L2 home • 10% L2 public • 10% L3 public	• 100% public	• 80% L2 home • 10% L2 public • 10% L3 public	• 100% public	• Only 54% of households can charge at home
NPV TCO	325,900	399,300	392,200	416,500	441,300	

Source: Koroma et al. (2025).

This shift is fundamentally driven by energy costs, as 100% reliance on public charging results in total energy costs that are 102% higher than those with home charging options.

Conclusions

03

The transition to paid public charging represents a significant shift in Saudi Arabia's electric mobility landscape, primarily affecting the 46% of households that lack access to residential electricity rates. As home-based charging remains tied to low-cost administered tariffs, a substantial segment of potential EV owners is disadvantaged by reliance on higher-priced public charging infrastructure.

Consequently, EV adoption risks becoming segmented by housing type: households with private charging access retain a cost advantage, while public-dependent drivers incur a 6% TCO premium.

To mitigate this emerging cost divide and sustain inclusive EV adoption, several policy and market interventions merit consideration:

- **Building code upgrades:** Expanding beyond current mandates to ensure new urban developments include the necessary charging infrastructure to support EV owners. This involves ensuring adequate electrical capacity, preparing electrical panels for future upgrades, and installing the necessary electrical connections in advance so that adding home or shared chargers is straightforward and avoids costly retrofits or becoming technically infeasible later.
- **Community, workplace, and commercial charging:** Develop affordable Level 2 charging stations in high-density neighborhoods, offices, and commercial areas. Prioritize locations where vehicles are already parked for work, errands, and leisure, leveraging existing parking and electrical infrastructure to enable routine charging during dwell time. This approach can reduce installation and operating costs, allowing prices to be set closer to residential electricity rates while improving access for households unable to install a home charger.
- **Involve EV manufacturers:** Engage EV manufacturers, who stand to benefit directly from accelerated adoption, as active partners in charging expansion plans. By co-investing in or partnering with charging networks, they can help narrow the charging divide, reduce consumer range anxiety, and address cost disadvantages. Such engagement ensures the transition to electric mobility remains socially inclusive while securing the long-term viability of the EV market in the Kingdom.

References

Electric Vehicle Infrastructure Company (EVIQ). 2025. "Discover EVIQ's Locations in Saudi Arabia Now." https://eviq.sa/en/locations.

General Authority for Statistics (GASTAT). 2024. Housing Statistics Bulletin 2024. Riyadh: General Authority for Statistics. https://www.stats.gov.sa/documents/20117/2435273/Housing+Statistics+Bulletin+2024+EN.pdf.

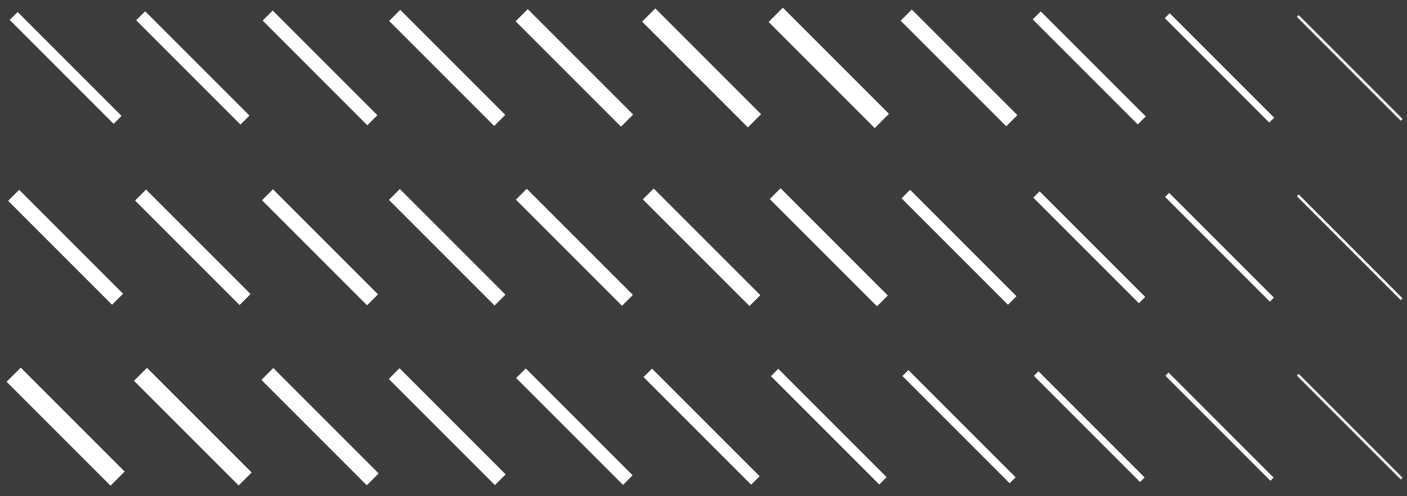
Koroma, Michael Samsu, Abdulrahman Alwosheel, Yagyavalk Bhatt, and Anvita Arora. 2025. "Life Cycle Environmental and Cost Analysis of SUVs: A Saudi Arabia Case Study." *Sustainable Futures* 9 (June): 100715. https://doi.org/10.1016/j.sftr.2025.100715.

Krarti, Moncef, Mohammad Aldubyan, and Eric Williams. 2020. "Residential Building Stock Model for Evaluating Energy Retrofit Programs in Saudi Arabia." *Energy* 195: 116980. https://doi.org/10.1016/j.energy.2020.116980.

Ministry of Municipalities and Housing (MOMRAH). 2020. Technical Requirements for Electric Vehicle Charging Stations. Riyadh: Ministry of Municipalities and Housing. https://momah.gov.sa/sites/default/files/2023-06/technical-requirements-for-electric-vehicles-charging.pdf.

Rush, Luke, Yan Zhou, and David Gohlke. Vehicle Residual Value Analysis by Powertrain Type and Impacts on Total Cost of Ownership. ANL/ESD-22/2. Argonne, IL: Argonne National Laboratory, 2022. https://publications.anl.gov/anlpubs/2022/07/176711.pdf.

Zawya. 2025. "E-FILL Introduces Public Tariff to Advance Saudi Arabia's Electric Mobility Vision." June 22. https://www.zawya.com/en/press-release/companies-news/e-fill-introduces-public-tariff-to-advance-saudi-arabias-electric-mobility-vision-uat92yzw.



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