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Improving the EV charging experience in India: Beyond charger deployment

- *Several factors influence electric vehicle (EV) sales and adoption rates. One key factor is how easy it is to charge the vehicle, which can make EV ownership either convenient and enjoyable or frustrating.*
- *Poor reliability of public EV chargers, interoperability hurdles among charging networks, expensive public charging, home charging challenges, and delays in grid connection are some of the issues that currently negatively affect EV charging.*
- *Tackling these issues will require a holistic approach that addresses convenience, cost, and ecosystem enablers in tandem. Policy interventions should aim to reduce friction in EV charging, strengthen charging economics, and accelerate India's transition to electric mobility.*

1. Introduction

India's electric vehicle (EV) industry is gradually maturing, enabled by growing sales, steadily rising adoption rates, and improving EV model availability as local manufacturing expands. EV sales have increased over the years, with growth accelerating rapidly to double digits in 2026 across vehicle segments, driven by the West Asia crisis and the resulting rise in fuel prices. Annual sales increased from about [50,000](#) vehicles in 2016 to around [2.5 million](#) in financial year (FY) 2025-2026. Monthly EV sales in July 2026 grew [63.2%](#) year-on-year to 307,752 units, reflecting the accelerating shift towards electric mobility.

Despite this sales growth, adoption rates (share of EVs in total vehicle sales) remain in the single or low double digits in most vehicle segments. In July 2026, electric two-wheelers accounted for [11.2%](#) of overall sales, electric cars [7.9%](#), and the adoption rate across all vehicle categories combined was [12.7%](#).

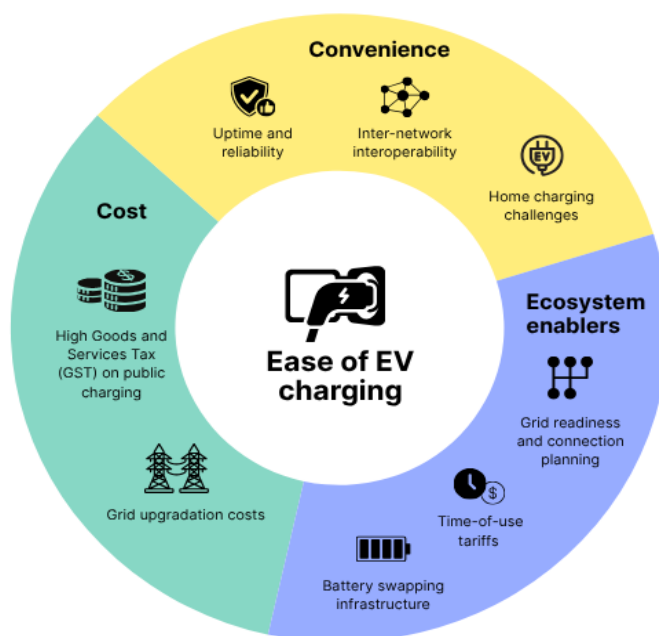
While several factors influence EV adoption, **a key consideration is the availability of and ease of access to charging infrastructure.**

Recognising this, both the Government of India and state governments have implemented a range of measures, including direct financial subsidies, regulatory reforms, policy mandates, and simplified administrative processes. Supported by these, the number of public charging

stations increased from [5,151](#) in 2022 to [52,718](#) by July 2026. With a meaningful number of charging stations installed and the momentum continuing, the task now is to tackle the pain points that undermine the EV charging experience.

Ease of EV charging depends not just on the number of public chargers, but also their reliability and affordability, and on how seamlessly users can access electricity at home, at work, and in public settings. Three broad dimensions (**Figure 1**) determine the charging experience: **Convenience**, which hinges on charger uptime and reliability, interoperability across networks, and the practical challenges of home charging; **cost**, influenced by the high Goods and Services Tax (GST) on public charging, and the capital expenditure required for grid upgradation; and **ecosystem enablers**, which include grid readiness and connection planning, the availability of battery-swapping infrastructure, and the design of time-of-use (ToU) tariffs that can shift demand to off-peak hours.

Figure 1: Factors influencing the EV charging experience



In this briefing note, IEEFA examines factors that affect the ease of charging and proposes solutions to reduce friction, drawing on Delhi (the state that notified the most ambitious EV policy in 2026) as a case study, as well as from a broader India perspective. Our recommendations were shaped by on-the-ground insights gathered from charge point operators (CPOs), which install and operate EV charging stations; Delhi power distribution companies (DISCOMs); and EV users.

2. Measures to improve the ease of EV charging

To address the issues across dimensions, the following measures are proposed:

2.1 Convenience

Convenience in charging is critical to building user confidence and accelerating EV adoption. Easy access to reliable charging — whether at home, work, or public locations — reduces range anxiety and ensures EVs fit seamlessly into daily routines. Without convenient options, even uptake of cost-competitive EVs risks being slower, making convenience a central pillar of India's electric mobility transition. There are several measures that can help improve convenience.

2.1.1 Improving uptime and reliability of public EV chargers:

The subsidies extended by the Union and state governments so far have largely focused on capital subsidies for installing public EV chargers. While these subsidies have increased installations, they have done little to ensure charger uptime and reliability. A [2024 study](#) by IEEFA had found that nearly 84% of EV chargers examined in a representative sample across South, Central, West, and East Delhi regions were found to be not functional. Even now, several EV users continue to complain of non-functional public chargers, especially at petrol stations and other public properties.

States such as Delhi have elements of a performance and transparency framework through its open charging database, designed to collect real-time and historical information from charging and swapping providers. However, in order to receive support under the Prime Minister Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) scheme, public chargers must be commissioned, energised and connected to the National Unified Hub — officially called the Unified Bharat e-Charge and yet to be operationalised — with information on location, availability, charging price and payment access.

Commissioning and digital registration alone do not establish whether a charging station is available and reliable. The Union and state governments should link a defined share of their future public support — such as land concessions, capital support, or viability gap funding (VGF) — to verified maintenance and charger performance. Conditions could include charger uptime, successful charging sessions, open access (charging access for all) where public support has been provided, interoperability, public disclosure of tariff and availability data, and maximum fault-resolution times. For fleet and depot sites, reporting could also quantify EV kilometres enabled and petrol, diesel, or compressed natural gas (CNG) vehicle-kilometres replaced. This would allow air pollution control boards and governments to assess the intervention's air-quality relevance.

Further, a programme to re-service and upgrade all public chargers installed with public capital subsidies should be introduced, coupled with incentives/mandates for minimum uptime and availability for all public chargers — current and upcoming.

2.1.2 Enhancing interoperability of charging networks:

Interoperability remains a pain point in India's EV charging ecosystem. While charging hardware — such as connector types — and software protocols have been standardised in recent years, gaps persist in how users access chargers through apps and payment systems.

Platforms like Statiq and myHyundai are building partnerships with CPOs to enable inter-network interoperability, but EV drivers still face the burden of juggling multiple apps and wallets to charge across networks. This not only creates friction at the point of charging but also leaves users with leftover balance across different wallets. To address this, the government could issue clear guidelines — or even a mandate — for a unified payment system across EV charging networks. Such a step would streamline the user experience, reduce inefficiencies, and make EV charging easier.

2.1.3 Addressing home charging challenges:

As EV adoption accelerates in India, one of the most persistent challenges for users is access to charging at home, particularly in multi-household, high-rise buildings common in cities.

While the Ministry of Housing and Urban Affairs updated the 2016 Model Building Bylaws to recommend that new residential and commercial buildings include provisions for EV charging (with [at least 20%](#) of parking spots EV-ready), these remain guidelines rather than enforceable mandates.

Delhi, along with some other states, has taken proactive steps through its [EV policy](#), encouraging resident welfare associations (RWAs) and housing societies to facilitate community or private charging infrastructure. Delhi has also introduced a DISCOM-led single-window system that allows consumers to select empanelled vendors, obtain new EV electricity connections or meters, and schedule installations. These measures are important, but they do not fully address the barriers residents in existing buildings face. RWAs may still deny requests to install chargers, citing disputes over parking, wiring in common areas, or concerns about safety, aesthetics, and shared costs.

To address these, India could consider introducing a “right to charge” for residents with designated parking spaces. Such a measure would ensure that legitimate requests for safe charger installations cannot be arbitrarily blocked, while ensuring compliance with technical and safety standards. Establishing this right would reduce uncertainty for EV users, ease conflicts with RWAs, and create a more predictable pathway for home charging.

2.2 Cost

The high cost of public charging undermines EV unit economics and deters potential EV adopters. The following steps can be taken to lower the cost of public EV charging in addition to providing capital subsidies.

2.2.1 Reducing the GST on public EV charging:

Charging at public stations currently attracts an 18% GST, significantly increasing expenses for EV owners who do not have access to home charging. In some cases, the charging costs could equal the cost of running a CNG vehicle. Reducing the GST on public EV charging to 5%, in line with the rate applied to the purchase of EVs, would ease this burden and make public charging more affordable.

Aligning tax policy with the broader EV transition would not only reduce cost barriers for consumers but also strengthen confidence in public charging networks — an essential step for scaling EV use.

2.2.2 Financing grid upgradation costs:

Upstream grid upgradation costs can easily account for 50% of the total cost of setting up a public EV charging station. This is burdensome for many CPOs, who are yet to be profitable due to low charger utilisation. A mechanism could be developed to separately finance these upstream grid upgradation costs through infrastructure or development financing.

Delhi has already acknowledged that the difficult part of charging deployment is often not the charger itself, but securing land, distribution capacity and upfront grid work. The Delhi Transco Limited public-charging tender model sought to address these constraints by leveraging public land and upstream electrical infrastructure support. At the central level, PM E-DRIVE has allocated [INR2,000 crore](#) (USD211 million) for public charging infrastructure and support for battery swapping and charging stations, including upstream components such as transformers,

high-tension (HT) and low-tension (LT) cables, protection equipment, and civil works. The programme could provide up to 100% support for charging infrastructure at government premises with free public access, while government-controlled public locations could receive 80% support for upstream infrastructure and 70% for charging equipment.

A quick calculation indicates that an investment of INR2,000 crore will support the installation of approximately 18,811 charging points under the policy target mix, assuming 100% subsidy for both upstream and EV charger equipment. This accounts for less than 2% of the [1.32 million](#) public chargers required to achieve the 30% EV adoption vision by 2030.

A long-term financing solution that treats upstream grid upgradation costs as infrastructure costs and finances them separately at a concessional long-term rate will benefit CPO finances and speed up charger deployment. Upstream infrastructure can cover distribution transformers, LT and HT cables, AC distribution boxes, circuit breakers/isolators, and other protection equipment.

2.3 Ecosystem enablers

Ecosystem enablers are essential for an EV industry to mature, scale up, and ultimately drive down costs across the value chain. By strengthening supporting infrastructure and the policy environment, these enablers can accelerate charging-network deployment, expand consumer choice, and make electricity for EVs more affordable. The following are some key enablers

2.3.1 Grid-readiness and connection planning:

With EV sales rising across vehicle categories, a significant share of transport energy demand will shift from oil and gas retailers to power distribution companies. This transition calls for close coordination among transport departments, transmission and distribution utilities, and power sector regulators to come up with a comprehensive grid-readiness plan.

Such plans should map projected charging demand at e-bus depots, taxi hubs, delivery clusters, e-auto stands, logistics centres, and public parking facilities. They can outline available capacity, required upgrades, and connection timelines, providing the clarity needed for a faster rollout of EV charging infrastructure and ensuring the grid is ready to support India's accelerating transition. In addition, steps should be taken to avoid delays in approvals and permits from the DISCOMs.

2.3.2 Battery swapping or a battery-as-a-service model:

Battery swapping offers distinct advantages and could play a pivotal role in accelerating EV adoption, particularly among commercial fleets of two- and three-wheelers. By decoupling the battery from the vehicle, swapping reduces downtime, lowers upfront costs, and addresses user concerns about battery degradation, making it an attractive option for high-utilisation segments.

At present, however, battery swapping services attract an 18% GST, which raises costs for operators and users. Aligning the tax treatment with fixed batteries — where GST is set at 5% — would level the playing field and encourage wider uptake of swapping solutions. A lower GST rate would not only reduce the financial burden on fleet operators but also signal policy support for innovative charging models that can complement conventional plug-in infrastructure.

2.3.3 Introduce well-structured ToU tariffs:

Well-structured ToU tariffs can be a powerful tool for shaping charging behaviour and aligning EV adoption with broader power system objectives. By incentivising users to charge during

off-peak or renewable-rich hours, ToU tariffs can shift demand away from conventional evening peaks and toward periods when solar generation is abundant. This not only supports grid stability but also maximises clean energy integration into transport and reduces stress on distribution networks, lowering overall system costs. When designed effectively, they can encourage fleet operators and individual users alike to adapt their charging patterns, easing congestion during peak hours and accelerating India's transition to a more flexible, renewable-ready grid.

3. Conclusion

Improving the ease of EV charging will require a holistic approach that addresses convenience, cost, and ecosystem enablers in tandem. Improving the uptime and reliability of public chargers, enhancing inter-network interoperability, and resolving home-charging challenges will directly improve user confidence. At the same time, reducing the GST burden on public charging and enabling low-cost financing for grid upgradation can make charging more affordable and sustainable. Finally, ecosystem measures such as proactive grid-readiness planning, support for battery-swapping infrastructure, and well-structured ToU tariffs would align charging demand with system capacity and renewable integration. Together, these interventions can reduce friction for users, strengthen charging economics, and accelerate India's transition to electric mobility.

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The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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