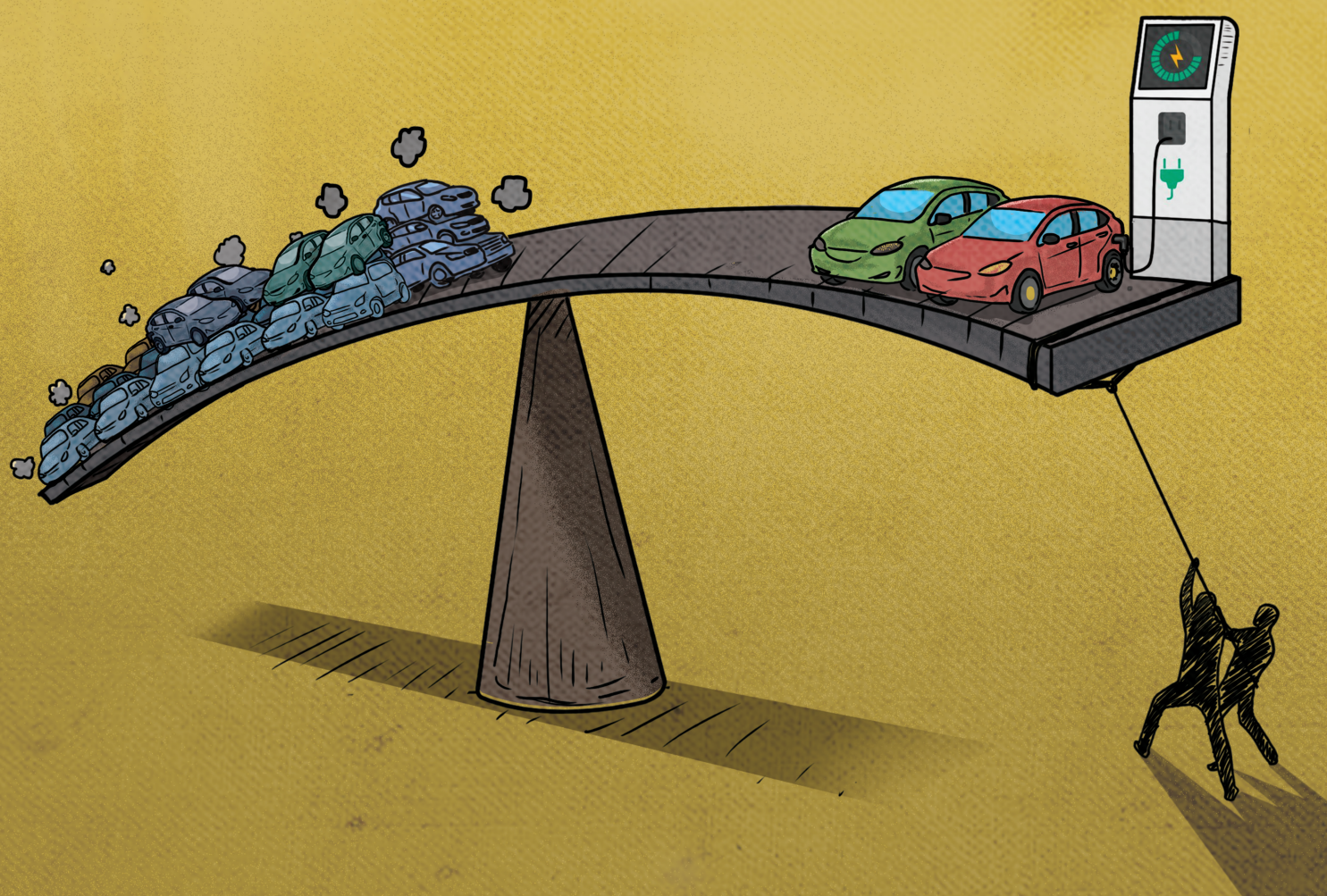
POLICY MANDATES AND MARKET SIGNALS

Driving West Bengal's zero-emission vehicle roadmap



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Driving West Bengal's zero-emission vehicle roadmap

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Maps in this report are indicative and not to scale.

Citation: Anumita Roychowdhury and Kalyani Tembhe 2026, *Policy Mandates and Market Signals: Driving West Bengal's Zero-emission Vehicle Roadmap*, Centre for Science and Environment, New Delhi

Published by
Centre for Science and Environment
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Why this study?

The state of West Bengal is currently implementing both state-wide and city-specific clean air action plans under the National Clean Air Programme (NCAP). Furthermore, it has developed the State Climate Action Plan 2030, which establishes low-carbon pathways. Both roadmaps rely on upscaling the BEV (Battery Electric Vehicle) fleet and integrating electric mobility strategies to support both clean air and low-carbon growth.

The government of West Bengal has already adopted the West Bengal Electric Vehicle Policy (also referred to as Electric Vehicle 1.0 or EV 1.0), 2021 policy for implementation. This framework incorporates national fiscal incentive programmes alongside state-level tax measures and strategies for infrastructure development. While this initial phase has helped to catalyse the EV programme, the lessons learned are essential for informing the roadmap for the next stage of development. There is considerable learning from this first phase of implementation to support a 'best practice' approach and to strengthen the regulatory framework.

This analysis, conducted by the Centre for Science and Environment (CSE), focuses specifically on ground-level lessons and the enablers required to drive this transformation. Both national and state-level policies, programmes and incentive schemes are evolving continuously to drive structural change. Considerable insights have been gained from the initial implementation phase in the state, providing a basis for a 'best practice' approach and the strengthening of the regulatory framework.

This report investigates shifting from a reliance on demand-side fiscal incentives toward supply-side regulatory mandates, such as a Zero Emission Vehicle (ZEV) mandate, to make the transition more sustainable and revenue-neutral. First-generation measures primarily relied on demand-side incentives to stimulate the market. While national schemes provided direct fiscal support, state-level policy focused on tax concessions, charging infrastructure development, electricity pricing, industrial investment in the EV sector to create jobs, and targeted procurement of electric buses. While these measures remain necessary, there is a growing interest in levers that can build the market while reducing long-term dependence on fiscal incentives. This issue is emerging at both the state and national levels.

Environmental imperatives of zero emissions transition: It is first necessary to understand the significant impact current fossil-fuel-based transport has on the region's air quality and energy consumption. The transition to BEVs directly addresses the severe pollution levels in West Bengal's major corridors, such as the Kolkata Metropolitan Area (KMA), Howrah, Asansol-Durgapur and Siliguri. As per the source inventory studies carried out by the Energy Resource Institute in 2025, road transport currently accounts for over one-third of annual $PM_{2.5}$ emissions and approximately 58 per cent of annual NOx emissions in Kolkata's urban airshed. In the Kolkata Municipal Corporation area, the transport sector is responsible for an estimated 76 per cent of NOx emissions. Electrification provides a pathway to drastically cut this exposure. Even with the current national grid mix, the life-cycle emissions of BEVs remain lower than those of internal combustion engine (ICE) vehicles. The programme offers a way to simultaneously reduce the carbon intensity of energy use in a sector where consumption increased by 153 per cent between 2014–15 and 2024–25. Electrification leverages the progressive renewable energy targets of the State Action Plan on Climate Change 2030, strengthening West Bengal's overall low-carbon strategy.

Beyond immediate tailpipe emissions, the report identifies several systemic benefits. Integrating EVs into the state's power network can enhance overall grid stability. Moving away from fossil fuels reduces the state's dependence on imported petroleum.

New age motorization needs to be zero emissions: Overall motorization in West Bengal has reached record levels in 2025, driven by a consistent upward trend in private-vehicle ownership. As of late 2025, the state continues to see significant monthly additions to its vehicle population, primarily led by the two-wheeler and passenger car segments. Annual registrations for key segments like two-wheelers and cars have seen a 1.4-fold increase over the last decade (2015–25). Personal mobility dominates the state's transport landscape, reflecting a shift away from public transit options.

Motorization is highest in industrial-urban belts such as Kolkata, Paschim Burdwan (Durgapur/Asansol) and Howrah. Areas like Alipurduar, Nadia and Siliguri have emerged as top performers for new vehicle registrations in 2025, particularly in the two-wheeler segment.

Current level of electrification: While the EV Policy 2021 targeted 10 lakh electric vehicles across all segments, current registrations represent only a small fraction of this goal. Two-wheelers constitute nearly 38 per cent of the total BEV stock. The penetration rate grew from 0.3 per cent in 2021–22 to 3 per cent by 2025–26.

Three-wheelers (L5 passenger and goods) is the fastest-growing electrified segment, representing over 11 per cent of the total BEV stock. Penetration in these segments rose sharply from three per cent (passenger) and nine per cent (goods) in 2021–22 to 41 per cent by 2025–26 (till September 2025). E-rickshaws account for the largest share of the current electric fleet at 47 per cent of registrations. Private car electrification remains at three per cent in 2024–25, rising from 0.4 per cent in 2021–22 to 5.7 per cent in 2025–26 (till September 2025). The commercial cab segment has seen an impressive jump to 9 per cent in 2024–25, compared to just one per cent at the start of the policy. Buses represent the weakest link in fleet electrification, making up less than 0.4 per cent of total bus registrations since the policy began.

Even though the growth rate has begun to pick up during the recent years, the baseline numbers are still very small.

Evolving charging ecosystem: The infrastructure has evolved through three primary channels: government-led bus depot modernization, the emergence of 'model' smart cities, and private operator expansion. As of mid-2025, the scale of West Bengal's infrastructure reflects steady but concentrated progress. The operational stations are still small—approximately 1,200 operational public and private chargers as of November 2025. These are largely concentrated in Kolkata and New Town. Modernized WBTC depots serve as the backbone, with 10 primary facilities. The numbers are still very small.

Public charging relies on a mix of land allocation, standardized technology, and financial viability for operators. De-licensing of charging services, special electricity tariffs, guaranteed timelines for connections, battery swapping and leasing, and environmental compliance are expected to be strong enablers, but implementation gaps remain.

While there has been substantial progress in setting up infrastructure, there are still shortfalls that need to be addressed quickly. High costs for civil works, land levelling and substantial connection fees strain private operators.

Evolving policy framework for electrification in West Bengal: The state has several established regulations and policy frameworks that provide a foundation for a BEV mandate. These existing tools range from building codes and tax exemptions to specialized utility regulations.

The West Bengal Electric Vehicle Policy, 2021, is the overarching framework released by the Power Department. It has a five-year validity (until 2026) and

envisions the state as a 'model state' for e-mobility in India. This outlines the aspirations to be among the top three states in e-mobility penetration, reaching 10 lakh EVs and 1,00,000 charging stations by 2025. Fiscal incentives include full exemption of road tax and registration fees for new electric two-wheelers and four-wheelers (extended through March 2025).

It provides support for charging infrastructure, including promotional tariffs. Amended rules require EV-ready connections in new municipal developments and New Town projects. There is a mandate for DISCOMs to release electricity supply to charging stations within 48 hours of application.

It has proposed creating, designating, and developing Kolkata, Asansol, Darjeeling and Howrah as 'Model Electric Mobility Cities,' with New Town as the initial pilot hub. An institutional mechanism has been established to coordinate policy, monitor progress and guide the phase-out of internal combustion engine (ICE) vehicles. Existing building laws have already been amended to mandate BEV readiness in new developments. These include the West Bengal Municipal (Building) Rules, 2007 (amended February 2023), which mandate that large new developments (residential with more than 30 flats, institutional, industrial, etc.) must provide charging infrastructure for 10 per cent of total parking spaces.

The New Town Kolkata (Building) Rules, 2009 (amended September 2021)2, require at least 2 per cent of all car parking spaces to have EV charging facilities for all plots, regardless of size. It mandates 20 per cent of parking space for EV charging for plots above 10 hectares. This exempts these EV-dedicated spaces from Floor Area Ratio (FAR) and Ground Coverage calculations to incentivize developers. Utility and power regulations have included special tariffs for Battery Electric Vehicles (BEVs). The state electricity regulatory commission has established a dedicated single-part tariff for BEV charging.

Fiscal and registration regulations include Motor Vehicle Tax and Registration exemptions. This exemption has been extended through March 31, 2025. In alignment with central guidelines, West Bengal recognizes that BEV charging is a 'service', meaning established stations do not require a separate distribution license.

An EV Accelerator Cell has been formed to facilitate inter-departmental coordination; this cell is specifically tasked with framing regulatory mechanisms and facilitating the phasing out of internal combustion engine (ICE) vehicles across 2W, 3W and 4W segments.

Transitioning to policy mandate and targets: Regulatory targets for electrification has become necessary as West Bengal's current progress is insufficient to meet its 10-lakh EV target by 2025. Mandatory targets provide long-term certainty for the industry, encouraging firm investment in production and infrastructure. While incentives stimulate consumer demand, they do not ensure a robust supply chain. A mandate ensures that manufacturers prioritize ZEV production and model diversity. This is needed to correct market distortions. Unlike purchase requirements that can put upward price pressure on limited supply, sales mandates put downward pressure on costs as OEMs compete to stay compliant.

In the next phase it is more important to focus on the regulatory levers and infrastructure development rather than long-term demand incentives to accelerate change. This will also make the strategy revenue neutral. The core argument for revenue neutrality is that a ZEV mandate shifts the financial responsibility of market development from the state exchequer to vehicle manufacturers (OEMs). This leads to reduced dependence on subsidies. Traditional demand-side incentives, such as direct cash transfers, are temporary and costly for the government. A mandate is revenue-neutral because it uses market competition rather than government pay-outs to lower vehicle prices.

This ensures lower cost curves. By requiring OEMs to sell a minimum percentage of ZEVs, the policy forces them to compete, which drives innovation and economies of scale, naturally lowering down the Total Cost of Ownership (TCO). The TCO for electric vehicles (EVs) in India has reduced significantly over the past decade, making them increasingly competitive with internal combustion engine (ICE) vehicles. This shift is primarily driven by falling battery costs, lower operating expenses, and targeted state-level incentives. Battery packs, which can account for 40 per cent of a BEV's upfront cost, have seen an 80–85 per cent price drop since the mid-2010s. Electricity is significantly cheaper per kilometre than petrol or diesel.

BEVs require less frequent and cheaper routine maintenance due to fewer moving parts. The state has implemented a 100 per cent exemption on road tax and registration fees, which has advanced the price parity timeline for new buyers by one to two years. Two-wheelers have achieved TCO parity by the early 2020s; are now cheaper on a lifetime basis in most scenarios. Electric autos can achieve TCO parity with CNG variants within two years of purchase with current subsidies. Ownership costs are shrinking, but EVs still cost 1.3–1.7 times more upfront than similar ICE models. High-mileage fleets (driving 40–60 km/day) already find EVs more economical due to fuel savings.

The mandate can be supported by a credit system where manufacturers earn credits for ZEV sales. Manufacturers who exceed their targets can sell surplus credits to 'laggards', creating a private revenue stream that does not rely on state funding. It is possible to have a self-sustaining fiscal model in which surcharges levied on high-emission internal combustion engine (ICE) vehicles directly fund any remaining rebates for BEVs.

Legal levers for ZEV mandate: The legal framework for the implementation of the ZEV mandate has been reviewed. While the Motor Vehicles Act (MVA) handles administrative functions, environmental statutes provide a tangible authority for enforcing ZEV mandates and ICE phase-outs. For instance, Section 3(1) of the Environment (Protection) Act (EP Act), 1986 grants the government broad powers to take 'all such measures' necessary to protect environmental quality, including restricting new registrations of polluting vehicles. Section 5 of the EP Act empowers authorities to issue binding directions to any person or officer, which can include prohibiting or regulating specific processes or vehicle operations. Section 19 of the Air (Prevention and Control of Pollution) Act, 1981 allows the state to declare 'Air Pollution Control Areas', enabling targeted restrictions on high-emission vehicles in specific zones. Section 31A has power to issue direct, binding orders to regulate industries or processes, such as restricting fuel supply to non-compliant or overage vehicles. Section 65(1) of the Motor Vehicles Act (MVA), 1988 authorizes states to make rules regarding vehicle registration, providing a basis to prioritize BEVs or limit new Internal Combustion Engine (ICE) registrations. Sections 28 and 29 of Municipal or Local Acts (e.g., KMC Act), 1980 empower urban local bodies like the Kolkata Municipal Corporation to manage public streets and enforce movement restrictions in urban cores.

Courts in India have established that public health and environmental protection outweigh commercial convenience and have regulated to promote clean vehicles. In the M.C. Mehta v. Union of India (2002) case, the Supreme Court directed a complete phase-out of diesel buses in Delhi and mandated their replacement with CNG. This landmark case confirmed that Section 3(1) of the EP Act allows for systemic interventions in the transport sector. In the Vardhaman Kaushik v. Union of India (2015) case, the National Green Tribunal (NGT) used the Air Act and Environment (Protection) Act to ban diesel vehicles older than 10 years and petrol vehicles older than 15 years in Delhi-NCR, reinforcing the authority to intervene directly when air quality deteriorates. In the case of Court on its Own Motion v. Union of India (2018), the Delhi High Court upheld strict cut-off dates for BS-IV registrations, affirming that environmental deadlines are non-negotiable.

These precedents are important guidance for future action.

Operationalizing policy mandates in states

ZEV mandate: To operationalize a Zero-Emission Vehicle (ZEV) transition in West Bengal, the state must shift from voluntary incentives to a mandatory framework. This requires leveraging public procurement as a market catalyst. West Bengal can operationalize mandates through specific administrative and procurement strategies:

A target setting system provides a predictable roadmap for the industry, transforming 'vision' into 'accountability'. It can be a segment-wise phase-out**.** The proposed EV Accelerator Cell (under Section 8[1] of the state's EV Policy) is tasked with developing a segment-wise ICE phase-out plan. Transport Departments can cap new registrations for high-emission vehicles in 'pollution-sensitive zones' while fast-tracking electric vehicle (EV) registrations.

West Bengal could adopt a credit-based system (similar to Maharashtra) where manufacturers earn credits for ZEV sales, which can be traded or used for compliance. In the long-term alignment, the state can aim for 100 per cent ZEV sales by 2040, with clear interim milestones for 2030 and beyond.

Procurement for fleet electrification: Public procurement serves as a 'market-maker', using government purchasing power to create guaranteed demand and lower costs through scale. This can include government fleet mandates, public transport priority, electrifying bus networks (such as the Kolkata network), ferries and municipal utility vehicles (garbage trucks) that reduce fuel bills and serve as a public demonstration of technology.

Aggregator mandates are possible: Mandating that a percentage of app-based taxi and delivery fleets be electric by specific deadlines (e.g., 2026 for aggregators in Delhi). Under the state policy, a dedicated fund could be tapped to support public agencies in covering the higher upfront costs of EVs.

Precedents in other states: In Delhi-NCR, Section 12 of the CAQM Act 2021 was leveraged to mandate only CNG/electric auto registrations as of Jan 1, 2023. Delhi has implemented a draft aggregator policy targeting 100 per cent electrification by 2026. In NCR districts a diesel auto phase-out has been mandated, with completion in Gurugram and Ghaziabad by December 31, 2024, and remaining districts by Jan 1, 2027. Maharashtra included a ZEV Credit Programme in its

policy to explore manufacturer feasibility. Chandigarh attempted a registration quota system, highlighting the need for digital tracking to prevent inter-state transfers.

Growing industry preparedness: In West Bengal, there is a positive trend towards growing electrification of the new vehicle sales. West Bengal's EV market is transitioning from 'niche adoption' to 'market readiness'. Penetration levels as of late 2024–25 include. High-impact segments such as commercial and last-mile vehicles are leading adoption due to lower running and maintenance costs. Three-wheeler goods and passenger segments have achieved approximately 41.1 per cent and 40.8 per cent penetration, respectively. Commercial cabs have reached 10.3 per cent penetration. Personal electric cars have reached a 5.7 per cent rate, notably exceeding the national average organically without direct fiscal incentives.

However, OEM Landscape shows that the number of BEV motor car models remains lower than the national average; in 2025, West Bengal saw sales from 13 car OEMs compared to 21 nationwide. Policy mandate and long term policy certainty can catalyse the market and product development faster.

In the two-wheelers segment, Ola Electric maintains the strongest demand, particularly in Burdwan, Medinipur and Durgapur. In three-wheelers, Mahindra has captured a significant portion of both passenger and goods e-three-wheeler markets. In the cars/cabs segments Tata Motors and Citroen dominate the growing electric cab segment, with fleet operators like Snap-E and Everest Fleet forming major partnerships with them.

While current fleet growth in the bus segment is stalled, Tata Motors, Olectra Greentech and PMI Electro are the leading national players that have historically contributed to the India electric bus segment.

BEV market evolving in high cost regime: West Bengal is better-positioned to scale its EV market through non-subsidy levers due to several regional strengths. The West Bengal market has already demonstrated adaptability to a reduced incentive structure, which currently consists of a combination of national demand incentives and temporary state-level tax measures. Furthermore, charging infrastructure in the state has begun to develop using fully priced strategies without significant concessions, resulting in rates that are already higher in West Bengal than in other regions.

West Bengal represents a unique case where the initial electrification has begun with low level of subsidy support and comparatively higher cost regime. In West Bengal, specifically in Kolkata, Charge Point Operators (CPOs) and investors face significantly higher connection costs and capital expenditures (CAPEX) compared to Delhi due to differences in state-level utility structures and subsidy frameworks.

There are several systemic and regulatory factors contributing to these high costs in West Bengal, which include higher utility charges. WBSEDCL (the State Nodal Agency) charges connection fees that are nearly four times higher than those levied by DISCOMs in Delhi. In West Bengal, CPOs are typically responsible for funding their own High Tension (HT) lines and transformer setups.

WBSEDCL mandates dedicated meter rooms for charging stations above certain capacity, which adds to civil and electrical costs of the project. While Delhi offers capital subsidies for charger installation and 100 per cent SGST reimbursements on batteries, West Bengal currently lacks dedicated state budgetary support or viability gap funding (VGF) for private CPOs. Many shortlisted sites in West Bengal require extensive civil work, including land levelling and drainage, which increases the initial capital burden. Due to high upfront costs and initially low utilization, the break-even period has stretched from the typical three years to five to seven years.

In contrast, schemes like PM E-DRIVE in other regions can cover up to 100 per cent of upstream infrastructure costs like transformers and cabling. Specific technical requirements add to costs.

Even public stations in West Bengal must often pay high commercial electricity tariffs for up to two months while waiting for the official EV tariff approval to take effect.

These high capital barriers deter smaller CPOs and independent investors, leaving the market primarily to large corporations who have the scale to manage extended break-even timelines. But upscaling can create more opportunities for more players.

Even though these factors have contributed to slower pace of change in the initial stages, West Bengal has the opportunity to demonstrate the effectiveness of regulatory levers in driving markets and investments instead of remaining dependent on direct subsidy support. The state market has already taken off in the context of a higher cost regime.

The way forward

The current level of modest motorization, the advantage of compact city layouts, the dominance of public and para-transit in the capital region, and surplus electricity in the state together create favourable conditions for rapid electrification. Building on these enabling factors, the transition now requires a sequenced package of legal, regulatory, infrastructure, fiscal, industrial and institutional measures.

Strategic policy and regulatory framework: The first step is to establish the legal and structural foundation for the transition. This includes adopting and enacting phased BEV mandates by implementing segment-wise ZEV sales and procurement targets that begin at modest levels and ramp up over a five-year period. Target-setting should also be explicitly prioritised by segment—accelerating electrification first for high-mileage commercial fleets, delivery services, public buses, two-wheelers and autos, and then scaling to private four-wheelers.

Infrastructure and urban planning: Charging readiness needs to be embedded in the urban development guidelines rather than treated as an afterthought. EV-ready building codes should be integrated into building bylaws and development regulations, with clear provisions by project type. For residential projects, new developments with more than 30 apartments should be required to provide charging infrastructure for at least 10 per cent of parking spaces. In New Town Kolkata, requirements should specify a minimum of two per cent EV-ready parking across all plots, increasing to 20 per cent for large plots exceeding 10 hectares. In parallel, existing policy provisions should be taken forward to expand public charging and create a robust network of public, semi-public and private charging stations. Low-Emission Zones should also be implemented by designating specific urban zones that incentivise clean and electric vehicles through restricted access for polluting vehicles.

Fiscal strategies and market mechanisms: To reduce dependence on subsidies and build durable adoption pathways, financial and market instruments must be strengthened. EV-specific financial products should be enabled, including flexible EMI options, leasing models, green bonds and AI-based credit checks for vehicle financing. Fiscal support should be repurposed so that existing resources are redirected specifically towards upscaling EV adoption and charging infrastructure rather than general urban developmemt spending. A ‘polluter-pays’ tax system should be implemented by applying specific taxes on high-emission vehicles, with revenues earmarked to fund green finance initiatives and EV incentives. Feebate systems should also be adopted, where surcharges on high-emission ICE vehicles

directly fund rebates for ZEV purchases. In addition, market-based credits can be introduced so manufacturers earn ZEV credits based on performance metrics such as range and energy density, while those with a deficit can buy surplus credits from over-compliant manufacturers. Complementing these measures, manufacturing incentives should include interest-free loans and GST reimbursements for companies establishing EV factories or related business infrastructure.

Infrastructure and technical readiness: Ensuring readiness for scale requires both physical provisioning and technological upgrading. EV-ready building codes should also mandate that all new buildings are 'EV-ready' with charging conduits and EV-tariff electricity meters to accelerate home charging. Charging networks should be expanded by fully implementing and carrying forward existing policy provisions for public charging infrastructure. State governments should support technology and R&D upgrades, with a focus on battery durability, energy density, range, efficiency and advanced chemistry. Dedicated strategies are also needed to address logistics and freight electrification, covering both urban freight and long-distance freight.

Manufacturing, workforce and circular economy: The transition must be backed by local industrial capability and a sustainability architecture that reduces long-term resource risk. Support for EV manufacturing should include interest-free loans and GST reimbursements for companies setting up factories and business infrastructure, while capital subsidies should be provided for industrial essentials such as land, water, electricity and testing facilities. Workforce development must be treated as a core enabler by creating vocational and ITI courses to train EV drivers, mechanics and charging-station staff, alongside targeted programmes to bridge skill gaps and build a specialised workforce that can generate new jobs in the EV sector. Battery circularity should be anchored through a comprehensive BEV battery reuse and recycling policy to reduce raw material needs and build a refining industry, supported by second-life applications at scale, including stationary battery storage and street lighting. Technical standards should be strengthened through alignment with improved durability, energy density and safety requirements, including alignment with AIS-156 and AIS-038 Rev.2. A circular economy approach should be institutionalized to ensure material security and support secondary-life applications.

Fleet management and scrappage: Fleet renewal and vehicle scrappage programmes should be used as a primary mechanism to mandate electrification, explicitly aligning vehicle replacement and renewal timelines with mandatory electrification targets. Public communication should be strengthened in parallel

through targeted awareness campaigns on total cost of ownership and available state and Central incentives, so that consumer confidence grows alongside policy ambition.

Institutionalize the process: Finally, implementation needs a durable governance structure. The EV Accelerator Cell should be formalized as a statutory body to ensure inter-departmental coordination, including land and electricity approvals within guaranteed timelines. Monitoring should be institutionalized by establishing an independent council of researchers and think tanks to track policy implementation and registration impacts over time.

1. Environmental imperatives of zero-emissions transition

Even though West Bengal's motorization is modest compared most states, at the outset, it is necessary to recognize that rapid motorization has significantly driven energy demand and urban air pollution in West Bengal, particularly in the Kolkata Metropolitan Area (KMA), Howrah, Asansol-Durgapur and Siliguri corridors.

1.1. Pollution imperatives

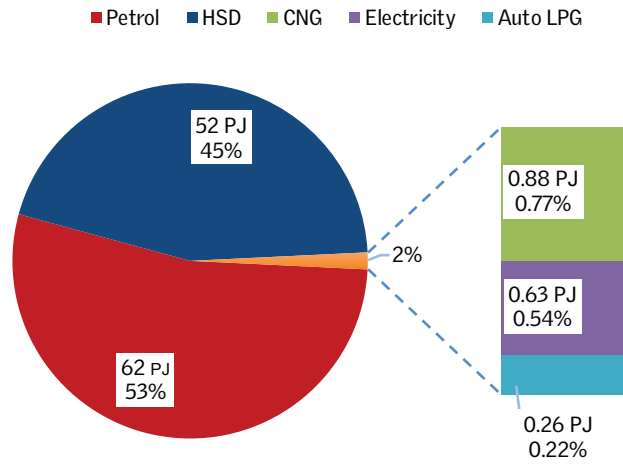
According to emission inventory and source apportionment studies released by the Tata Research Institute (TERI) in 2025 (based on 2023 data), road transport now accounts for over one-third of annual $PM_{2.5}$ emissions in Kolkata's urban airshed and approximately 58 per cent of annual NOx emissions. In the Kolkata Municipal Corporation (KMC) area specifically, the transport sector's contribution to atmospheric NOx emissions is estimated at 76 per cent.[1]

Furthermore, the total energy consumed by West Bengal's transport sector increased by 153 per cent between 2014–15 and 2024–25, and the energy mix remains fossil-fuel dominated (see *Graph 1: West Bengal fuel-wise transport sector energy consumption in 2024–25 (petajoules)*). Simultaneously, petrol and high-speed diesel prices in Kolkata have consistently remained among the highest of India's major metros like Delhi, Mumbai and Chennai. CNG's average retail prices vary between Rs 168 per kg to Rs 91 per kg in different districts of West Bengal, as in 2025.

Electrification of transport offers West Bengal a pathway to simultaneously reduce the carbon intensity of the energy use, cut exposure to air pollution, enhance grid stability, reduce dependence on imported petroleum and generate local employment in manufacturing, services and operations. Moreover, the progressive targets for renewable energy of the State Action Plan on Climate Change, 2030 further offer the opportunity to strengthen the low-carbon strategy. Following the Electric Vehicle Policy (2021), the state's EV transition has started.

Substantial evidence from national studies by the International Energy Agency (IEA), the International Council on Clean Transportation (ICCT), and the Indian Institutes of Technology (IIT) Kanpur and Bangalore, among others, demonstrates

Graph 1: West Bengal fuel-wise transport sector energy consumption in 2024–25 (petajoules)



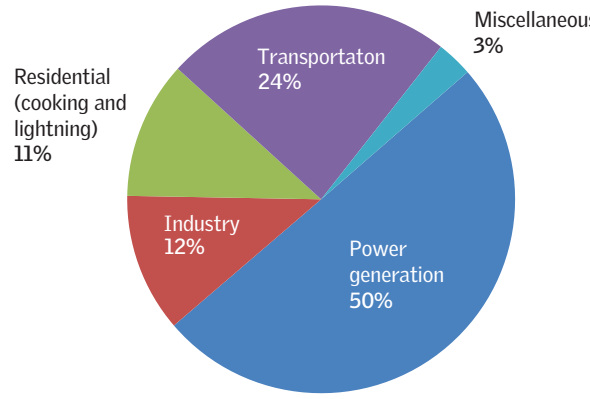
Source: CSE analysis based on PPAC, MoPNG, CEA, VAHAN data

significant emission reductions and clean-air benefits provided by rapid fleet electrification in India. Even with India's current grid energy mix—which is 70 per cent coal-based—the life-cycle emissions of electric vehicles (EVs) remain comparatively lower than those of internal combustion engine (ICE) vehicles. Consequently, there is a strong policy interest in accelerating fleet electrification through the implementation of appropriate enablers.

1.2. Energy imperatives

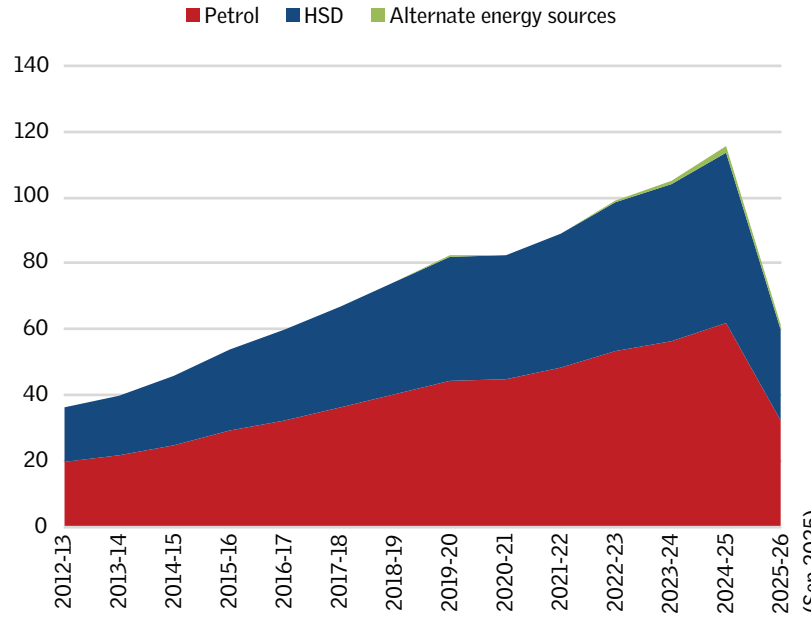
According to data from the PPAC, Ministry of Petroleum and Natural Gas (MoPNG), Ministry of Coal and Central Electricity Authority (CEA), the transport sector in West Bengal accounts for approximately 24 per cent of the state's total energy consumption as of 2021–22. Between 2014–15 and 2024–25, transport-related energy use surged by 156 per cent, with petrol and diesel fulfilling roughly 53 per cent and 44 per cent of requirements, respectively, in 2024–25. While the share of cleaner energy sources remains low, the sector is steadily transitioning. However, a growing dependency on CNG can weaken state energy security and lead to 'carbon lock-in' with redundant infrastructure. Electrification offers a superior alternative by reducing carbon intensity, reducing exposure to air pollution, enhancing grid stability and generating local employment. Massive increase in energy consumption necessitates a move away from fossil-fuel dominance. At this crossroads, growing reliance on CNG may offer short-term smaller gains but risks

Graph 2: West Bengal sector-wise energy consumption [2020–21]



Source: CSE analysis based on CEA and PPAC data

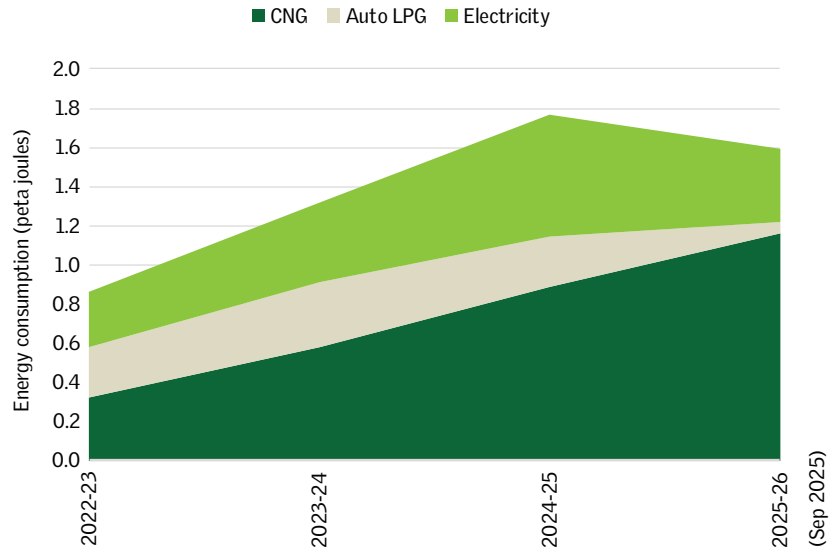
Graph 3: West Bengal fuel-wise transport sector energy consumption



Source: CSE analysis based on CEA and PPAC data

long-term energy insecurity compared to the systemic benefits of electrification and may also impede the zero emissions transition progress (see *Graph 2: West Bengal sector-wise energy consumption [2020–21]*; *Graph 3: West Bengal fuel-wise transport sector energy consumption* and *Graph 4: West Bengal fuel-wise clean energy transition of transport sector*).

Graph 4: West Bengal fuel-wise clean energy transition of transport sector



Note: To calculate the electricity consumption by the transport secctor, the CEA Public charging station data for heavy duty chargers was used for bus and goods carriers. For other vehicle categories CEA methodology for medium and long term power demand forecast was used to estimate annual electricity consumption.

Source: CSE analysis based on CEA and PPAC data

2. Policy imperatives

Consistent with the national trend, the Department of Power, Government of West Bengal, has issued a gazette notification (No 189-POW-2021) outlining the Electric Vehicle Policy 2021. This policy took effect on the date of its official publication and will remain in force for five years unless superseded.[2]

The policy has established the necessary conditions and opportunities for the electrification of the state's vehicle fleet. It outlines specific targets, strategies and policy measures designed to achieve these goals. Notably, the policy sets a state-wide target of 10 lakh (1 million) EVs and 1,00,000 public, semi-public and private charging stations by 2025 (see *Box: West Bengal EV policy 2021: Salient features*). The notification of this policy, a series of institutional and regulatory measures—spanning multiple departments and stakeholders—have been announced to operationalize these strategies on the ground.

In West Bengal, the West Bengal State Electricity Distribution Company Limited (WBSEDCL), functioning as the State Nodal Agency (SNA), has become a central actor in enabling ZEV transition. The SNA's mandate spans policy coordination, infrastructure development and long-term planning to enable a steady shift away from internal combustion engine vehicles.

The SNA's work is grounded in the West Bengal Electric Vehicle Policy notified on June 3, 2021. This policy outlines the state's ambition to scale electric mobility across multiple segments and identifies Kolkata, Asansol, Darjeeling and Howrah as model EV cities, with New Town chosen for piloting new approaches. To operationalize the policy, the government established the EV Accelerator Cell through a Department of Power notification dated February 17, 2023, creating an institutional mechanism for inter-departmental coordination and monitoring.

The Cell is responsible for advancing EV adoption across the state, guiding the conversion of ICE fleets, enabling charging networks and supporting investment through public–private partnerships. In addition to mobility outcomes, the Cell also contributes to parallel initiatives in industrial decarbonization and digital monitoring.

One of the Cell's early priorities was to secure land for charging infrastructure. The Chief Secretary was requested to direct all state departments to identify

WEST BENGAL EV POLICY 2021: SALIENT FEATURES

The West Bengal Electric Vehicle Policy, launched in June 2021, laid out a framework for accelerating the state's transition to clean mobility.

Key highlights of the policy

Objective: The policy aims to promote innovation through grants, venture funds and incentive strategies while enabling investment in charging infrastructure to leverage electrification for sustainable urban development.

Target metrics: West Bengal aspires to be among the top three states in electric mobility by the conclusion of the national FAME II policy. This includes reaching a public charging point ratio of eight and ensuring the environmentally friendly recycling and reuse of batteries. To have 10 lakh EVs combined across all segments of vehicles.

Strategy: Charging infrastructure development, demand creation approaches, and research and development.

Aligned fiscal incentives with the national demand incentive schemes

Institutional framework: An **EV Accelerator Cell** will be established within the transport and power departments to facilitate the phase-out of internal combustion engine (ICE) vehicles.

Infrastructure strategy: The state will facilitate the installation of charging points through a digital framework, concessional land leases for existing parking zones, and the integration of 'pop-up' charging with renewable energy and storage.

Innovative pilot projects on electric mobility: Clean street test bed, zero emissions zones, EV charging, smart and intelligent clean energy management

Charging infrastructure:

- Facilitate installation of charging points; enabling a digital framework; concessional locations, bare minimum lease rental from existing parking zones or other locations;
- Pop-up charging integrated with renewable energy (RE), storage through IoT, big data analysis, integrate EV with transit planning. Twinning of cities;
- Innovation challenge fund;
- Swapping stations and kiosks for two/three wheelers; private and commercial buildings to be incentivized to set up battery swapping stations. Discoms to release supply to charging and battery swapping stations.
- Open and publicly available data base on charging points; charging point registry;
- Comprehensive smart-tech-based EV charging;
- Cities and buildings codes; urban and regional development plan formulation and implementation guidelines;
- Energy sales—public charging (high and low tension) single tariff for two years;
- Third-party EV charging infrastructure will be allowed to procure electricity from the Discoms at regularly determined tariff and will be allowed to provide charging services for EVs

Electricity pricing: Discoms are authorized to set up charging stations with a fixed electricity tariff of Rs 6/kWh.

Model cities: Kolkata, Asansol, Darjeeling and Howrah are to be designated as Model Electric Mobility Cities, with New Town Kolkata serving as the initial pilot city.

Inter-city green routes; R&D plants

Skill development and workforce

unused land that could be repurposed for charging stations. Parallel outreach was conducted with WBSETCL, WBTDCL, the Urban Development and Municipal Affairs Department and district-level administrations to identify locations with reliable grid access. Considerable emphasis was placed on connecting high-traffic routes such as Kolkata–Digha, Kolkata–Bakkhali, Kolkata–Siliguri and Kolkata–Asansol to create the backbone of 'green routes' envisioned in the 2021 policy. WBSEDCL's regional offices also shortlisted sites near existing substations to minimize electrical integration costs.

To expand charging infrastructure rapidly, the state opted for a public–private partnership model. Under this arrangement, each selected site is allotted a minimum of 600 square feet and must host at least one DC charger of 30 kW or more, along with an AC charger. Infrastructure design has been standardized to ensure compliance with national electrical and safety standards, and stations must be visible on public navigation platforms such as the EV Yatra app.

Several rounds of competitive bidding have been completed, resulting in the award of sites across multiple phases. Phase 4 alone covers 245 new locations that are currently under process. Despite this progress, only 30 stations have been energized so far. This gap is largely attributable to low early-stage utilization, which affects the financial returns of charge point operators. Out of the Rs 78 crore set aside under the Revamped Distribution Sector Scheme (RDSS) for EV infrastructure, only Rs 4.5 crore has been spent to date (November 2025), mainly because many projects have not yet reached the execution stage.

According to a Deloitte assessment, the number of planned charging locations under the public–private partnership model is approximately 854. This includes sites covered under the first three phases of tendering, as well as locations identified for the next phase. The details of the three phases show that the state published tenders covering 676 sites and received 186 bids; 121 sites were awarded and 30 of them have been completed. This offers a clearer picture of the trajectory from tender to completion and highlights the large difference between sites published and sites that have been energized (see *Table 1: Progress of PPP tendering in West Bengal* and *Table 2: Distribution of sites across Charge Point Operators*).

The allocation of sites across individual operators also gives insight into the structure of the emerging market. A few firms hold a large share of the awarded locations, while others hold smaller portfolios. This uneven distribution affects the speed at which stations are deployed, especially because operators with limited

sites may not achieve the financial or operational scale required to mobilise teams quickly (see *Table 2: Distribution of sites across charge point operators*).

While private-sector participation is central to this framework, the state has also taken steps to support charging at petrol pumps. The SNA has simultaneously advanced charging development through sector-specific partnerships. A major thrust area has been the installation of charging stations at petrol pumps run by OMCs (Oil Marketing Companies).

These installations are supported by Central schemes, including FAME-II and PM E-DRIVE, and are guided by the updated national charging guidelines issued by the Ministry of Power on September 17, 2024. WBSEDCL has put in place

Table 1: Progress of PPP tendering in West Bengal

Phase	Sites published in RFP	CPOs participated	Bids received	Sites awarded	Sites completed
Phase 1	205	10	51	51	13
Phase 2	241	4	54	24	3
Phase 3	230	5	81	46	14
Total	676	19	186	121	30

Source: Deloitte

Table 2: Distribution of sites across charge point operators

Charge point operator	Sites awarded
Adani Total Energies	54
Ever Fuels	33
Rahul Traders	18
Emdee Digitronics	18
Kargerzee EV Technologies	8
N. R. Enterprise	7
Power One Micro Systems	6
Electrowaves Electronics	6
Terra Motors Charging Solutions	5
Emdee Venture	5
TMS Udyog	5
Reliance BP Mobility	11
B. G. Enterprise	1
Swati Mukherjee / Roll X Technologies	1

Source: Deloitte

a preferential single-part tariff for these establishments and has streamlined the application and energization process. Weekly review meetings are held with OMCs to accelerate rollout, and 268 (122 IOCL, 64 BPCL, 82 HPCL) charging connections have already been released out of 386 (194 IOCL, 99 BPCL, 93 HPCL) applications received.

According to WBSEDCL, as of now, West Bengal has roughly 1,200 public and private charging points and a total EV population of around 1.8 lakh vehicles, including approximately 18,000 electric four-wheelers. This results in a ratio of 15 EVs per public charging point for the four-wheeler segment, which is almost double the policy target of 8:1. The slower pace of station utilization has also influenced investment behaviour among private developers, making risk-sharing frameworks increasingly important.

Housing societies have also emerged as an important focus area. To reduce barriers to home charging, WBSEDCL organized a capacity-building workshop for residential associations in New Town, Rajarhat, Garia and Howrah. The workshop covered electrical requirements, space planning and tariff considerations. To support early adopters, the SNA launched no-cost technical surveys for housing societies in partnership with CPOs (charge point operators). Most residential chargers being installed are 3.3 kW AC units placed at individual parking bays. These systems are deployed under an operating expenditure model in which the CPO installs and maintains the charger while users pay a service fee determined by the contract. This approach avoids upfront capital expenditure for residents and societies, making the model easier to scale.

The electrification of public transport fleet has also begun. The South Bengal State Transport Corporation approached the SNA to set up charging facilities at its depots. WBSEDCL sanctioned a 200 kVA connection for this purpose under the RDSS scheme and developed the necessary electrical infrastructure at the Durgapur depot. This model not only supports the rollout of electric buses but also demonstrates how land owned by transport agencies can be leveraged to expand clean mobility without additional acquisition costs.

Awareness building has been another pillar of the SNA's work. Under the Go Electric campaign, the state organized roadshows, public demonstrations and stakeholder workshops. Two strategic corridors, Kolkata to Durgapur and Kolkata to Digha, were identified for eventual designation as EV-friendly roads. The campaign also included outreach to office complexes, RWAs and commercial establishments, with an intent to introduce a social certification for locations

that provide EV chargers. While the campaign has large programmatic potential, limited funding has restricted its on-ground scale.

Several challenges have affected the pace of implementation in West Bengal. Many shortlisted sites require substantial civil work, including land levelling, construction of approach paths and water drainage arrangements. These additional requirements increase the capital burden on CPOs, many of whom are reluctant to assume these risks in the absence of assured utilization. Site verification processes can be slow, and coordination across multiple government departments often extends project timelines.

The current revenue-sharing structure, under which a minimum of Rs 1 per kWh is payable to the government, has also yielded limited returns due to low energy sales in the initial years. Meanwhile, the absence of a robust digital backbone restricts the SNA's ability to monitor uptime or track operational performance in real time. Compounding these issues is the prolonged non-functionality of the national EV charging portal maintained by the Bureau of Energy Efficiency, which limits both public information and administrative visibility.

WBSEDCL is attempting to resolve these bottlenecks through a mix of administrative and technological interventions. Higher priority is now being given to consumer awareness, incentive uptake and the creation of stable digital systems for application processing and station monitoring. A single-window platform is under development to integrate approvals, payments and tracking into a single interface. The SNA is also working to secure land along major state and national highways to simplify site availability for developers. At the same time, more predictable funding for outreach campaigns and internal operations is being sought to maintain momentum.

CPOs themselves face challenges related to technology compatibility, high capital costs and uncertain returns. Many need to support multiple connector types, integrate booking and payment systems, and maintain interoperability through Open Charge Point Protocol (OCPP)-compliant chargers. Low public awareness, coupled with a lack of uniform pricing, restricts demand growth. The state is exploring measures such as interest subvention, viability gap financing for rural locations, regional maintenance networks and partnerships with fleet operators who can provide steady utilization in the early years. Improved visibility of charging stations across navigation platforms is also being prioritized to address consumer hesitation.

Overall, West Bengal has laid a broad institutional, infrastructural and regulatory foundation for electric mobility. The establishment of the EV Accelerator Cell, the build-out of charging networks in public, residential and commercial domains and the collaboration with OMCs and transport agencies reflect a coherent state-led effort. Yet, the current utilization levels and the financial strain faced by CPOs indicate that the transition is still in an early phase. The next phase of work will require deeper attention to affordability, digital governance, targeted incentives and inter-agency collaboration. With these elements in place, West Bengal will be well positioned to meet the targets enshrined in the 2021 EV policy and contribute meaningfully to India's clean mobility transition.

Post notification, a series of institutional and regulatory measures cutting across multiple departments and stakeholders have been announced to operationalize the policy on the ground (see *Table 1: Policies and amendments of rules since implementation of West Bengal EV policy 2021 [national and state level]*). This combines the national-level programmes and state-level amendments in rules to enable further evolution of the programme.

At the state level, the incremental progressive steps that were taken include road tax and fee exemption for EVs—from April 1, 2022, West Bengal Transport department waived off one-time motor vehicle tax and registration fees on new electric two-wheelers and four-wheelers (and all CNG vehicles). Initially for two years (FY 2022–23 and 2023–24) and later extended. The State Cabinet further extended the road tax and registration fee waiver for EVs to one year (April 2024–March 2025) to continue incentivizing EV adoption. This was initially announced in the 2022–23 Budget.

In 2022, EV Charging Tariff Order was issued in which the West Bengal Electricity Regulation Commission (WBERC) introduced a promotional tariff category for EV charging stations (single-part energy tariff, Rs 5.5 per kWh off-peak and Rs 6 per kWh peak, no demand charges). Applicable to public EV chargers to encourage investment.

In 2023, the Urban Development issued the WB Municipal Building Rules Amendment, 2023 (effective February 22, 2023) and extended EV-ready building norms to all municipal areas (except Kolkata/Howrah which have separate rules). In fact, earlier in 2021, New Town Kolkata Building Rules Amendment, notified by the Urban Development department on September 8, 2021, require EV charging infrastructure in new developments under New Town Kolkata Authority (see *Table 3: Policies and amendments of rules since implementation of West Bengal EV policy 2021 [national and state level]*).

Table 3: Policies and amendments of rules since implementation of West Bengal EV policy 2021 [national and state level]

Year	Issuing authority	Policy
2021 (June)	**West Bengal Power Department** (state government)	West Bengal Electric Vehicle Policy, 2021: Adopted via notification 189-POW dated 03/06/2021wbsedcl.in (effective till 2026). Set state targets (1 million EVs, 100k charging stations by 2025) and a roadmap covering charging infra (dedicated tariff), manufacturing, battery recycling and an EV Accelerator Cell for implementation.
2021 (September)	West Bengal Urban Dev. Dept.	**New Town Kolkata Building Rules Amendment:** Notified on September 8, 2021, requiring **EV charging infrastructure in new developments** under New Town Kolkata Authority
2022 (January)	Ministry of Power (MoP)	**Revised EV Charging Guidelines:** Issued January 14, 2022 (consolidated guidelines, later amended Nov 2022) for public charging infrastructuresansad.in. Key features: capped electricity tariff for public EV charging (single-part, not above average cost of supply) till 2025, mandates DISCOMs to provide connections for chargers on priority, allows any individual/entity to set up public chargers (with open access), and permits charging stations in residential/commercial complexes
2022 (April)	West Bengal Transport Department	Road Tax and Fee Exemption for EVs: From 1 April 2022, West Bengal waived one-time motor vehicle tax and registration fees on new electric two-wheelers and four-wheelers (and CNG vehicles). Initially for two years (FY 2022–23 and 2023–24) and later extended.
2022 (June)	Ministry of Power	Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022: Notified June 6, 2022, lowered the threshold for open access to 100 kW and allowed any consumer (including EV charging stations) to purchase renewable power directly. Also mandated speedy approval processes for green power access.
2022 (July)	West Bengal Electricity Reg. Comm.	EV Charging Tariff Order: WBERC introduced a promotional tariff category for EV charging stations (single-part energy tariff, Rs 5.5 per kWh off-peak and Rs 6 per kWh peak, no demand charges). Applicable to public EV chargers to encourage investment.
2022 (August)	MoEFCC (Env. Ministry) / CPCB	**Battery Waste Management Rules, 2022:** Notified August 24, 2022 to regulate end-of-life batteries. Imposed Extended Producer Responsibility (EPR) on producers for collection and recycling of used batteries, including lithium-ion EV batteries, with targets and a centralized online portal. Prohibited landfill disposal; set material recovery quotas and penalties for non-compliance.
2022 (September)	Ministry of Road Transport & Highways	**EV Battery Safety Standards:** After EV fire incidents, MoRTH amended vehicle safety norms via S.O. 4567(E) dated September 28, 2022 to mandate strict battery safety requirements (AIS-156 and AIS-038 Rev.2). Phased implementation: new safety provisions effective from 1 Dec 2022, with additional requirements from March 31, 2023. Also issued G.S.R. 888(E) in Dec 2022 requiring Conformity of Production for EV manufacturers
2022 (November)	Bureau of Energy Efficiency (MoP)	Central Nodal Agency for Charging—EV Yatra Portal—BEE was operationalized as the central nodal agency to coordinate public charging infrastructure. Launched the EV Yatra web portal and mobile app, providing real-time information on charging stations nationwidesansad.in.

Year	Issuing authority	Policy
2023 (February)	West Bengal Urban Development Department	**WB Municipal Building Rules Amendment, 2023:** Effective February 22, 2023, the state extended EV-ready building norms to all **municipal areas** (except Kolkata/Howrah which have separate rules).
2024 (April)	West Bengal Transport Dept.	Extension of EV Tax Exemption: State Cabinet extended the road tax and registration fee waiver for EVs by one year (April 2024–March 2025) to continue incentivizing EV adoption. Initially announced in the 2022–23 Budget, this extension reflects the state's commitment to sustain fiscal incentives for green vehicles.
2024 (September)	Ministry of Heavy Industries (Government of India)	**PM e-DRIVE Scheme (2024–26):** Launched September 29, 2024 as the Prime Minister's Electric Drive Revolution for Innovative Vehicle Enhancement', with an outlay of Rs 10,900 crore up to March 2026. Succeeds FAME-II, and provides demand incentives for e-2W, e-3W, e-trucks, e-buses and e-ambulances, plus grants for public charging stations and support to EV testing and R&D infrastructure. (An interim Electric Mobility Promotion Scheme 2024 ran in April–September 2024 with an outlay of Rs 778 crore to avoid a subsidy gap)

Source: Compiled by CSE

3. Status of electrification of vehicle fleet post EV policy 1.0

A rapid field assessment indicates progress in Electric Vehicle (EV) penetration in the state following the implementation of the EV 1.0 policy.

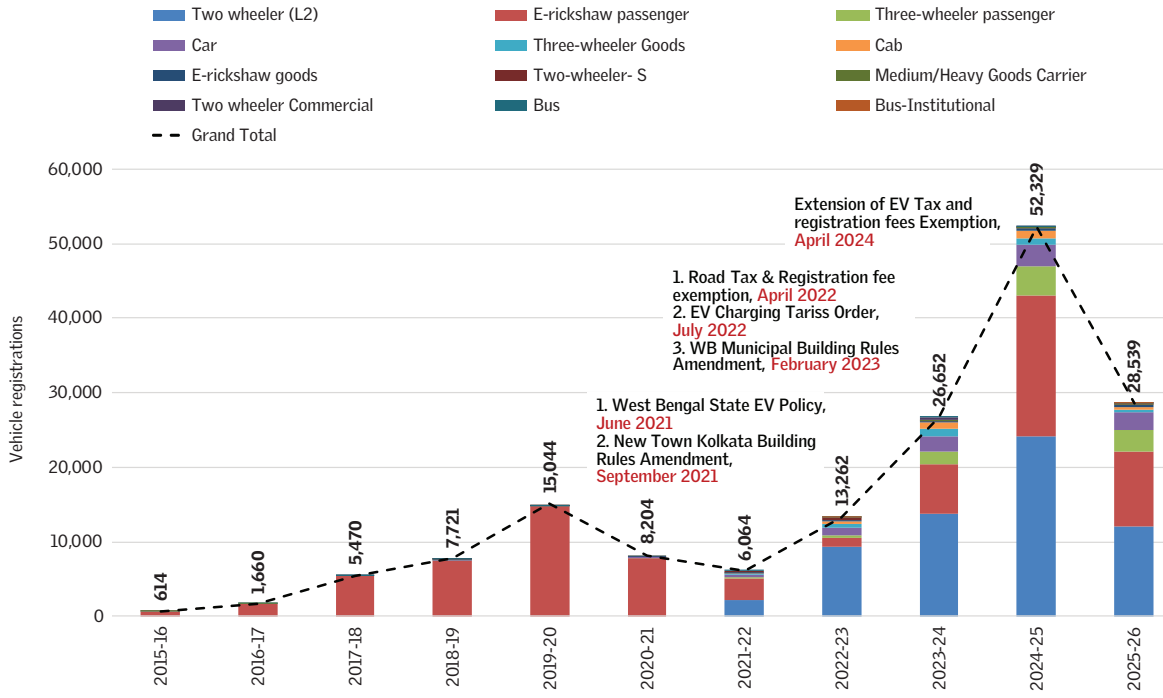
Against a target of 1,000,000 (10 lakh) vehicles across all segments, VAHAN database records from the Ministry of Road Transport and Highways show that the state registered 88,463 EVs (excluding e-rickshaws) as of September 2025. Including e-rickshaws brings this total to 1,34,590.

While this represents growth, the electrification trajectory of West Bengal's transport sector remains uneven across different vehicle segments and geographies. Furthermore, this figure is only a small fraction of the 10 lakh EV target set under the EV Policy 2021.

When considering the stock of Battery Electric Vehicles (BEVs) registered in West Bengal over the last decade (2015–16 to 2025–26), two-wheelers and e-rickshaws constitute nearly 38 per cent and 47 per cent of registrations, respectively. This trend is driven largely by personal mobility needs in urban and peri-urban zones. Meanwhile, three-wheeled vehicles (both passenger and goods) represent the fastest-growing electrified segment, accounting for over 11 per cent of the total BEV stock with a Compound Annual Growth Rate (CAGR) exceeding 150 per cent.

In contrast, the electrification rate for private four-wheelers remained marginal at 3 per cent in 2024–25, constrained by high upfront costs. However, commercial cab electrification saw an impressive jump to 9 per cent in 2024–25, compared to a meagre 1 per cent at the policy's inception. E-buses, despite being covered under FAME-II procurement, represent less than 0.4 per cent of total buses registered since the state EV policy began, revealing the weakest link in fleet electrification (see *Graph 5: Vehicle segment-wise BEV registrations in West Bengal along with year-wise favourable state policies*).

Graph 5: Vehicle segment-wise BEV registrations in West Bengal along with year-wise favourable state policies



Source: Vahan database (till September 2025)

3.1. Vehicle segment-wise BEV transition in West Bengal

Year-on-year registration trends indicate that the state has witnessed a significant surge in Battery Electric Vehicles (BEV) registrations in recent years, albeit from a small base. In 2024–25 alone, West Bengal registered 52,329 BEVs, marking an impressive 763 per cent increase since the notification of the EV policy in June 2021. Since the policy's introduction, registrations have grown across all segments, extending beyond just passenger and goods e-rickshaws. Even when excluding the e-rickshaw segments, the state still recorded a substantial 507 per cent rise in registrations between 2021–22 and 2024–25 (see *Graph 5: Vehicle segment-wise BEV registrations in West Bengal along with year-wise favourable state policies*).

A closer examination of segment-wise registration trends reveals that the BEV transition has been uneven, as anticipated. Following the implementation of the EV policy, both the three-wheeler passenger and goods vehicle segments recorded steep increases in penetration, rising from 3 per cent and 9 per cent respectively in 2021–22 to 41 per cent by 2025–26 (see *Graph 6: West Bengal year-wise and vehicle segment-wise BEV registration numbers and BEV penetration*).

Within the e-rickshaw segment, goods vehicles have shown a steady rise from 2017–18 onwards, while passenger vehicles experienced sharp spikes in 2019–20 and 2024–25, alongside consistent overall growth. Interestingly, the motor car and motor cab segments have transitioned faster than two-wheelers. Motor car BEV penetration increased steadily from 0.4 per cent in 2021–22 to 5.7 per cent in 2025–26, while the motor cab segment grew from 1 per cent to 9 per cent during the same period. By contrast, the two-wheeler segment saw a more modest rise, increasing from 0.3 per cent in 2021–22 to 3 per cent in 2025–26 (see *Graph 6: West Bengal year-wise and vehicle segment-wise BEV registration numbers and BEV penetration*).

3.2. Region-wise electrification of different vehicle segments

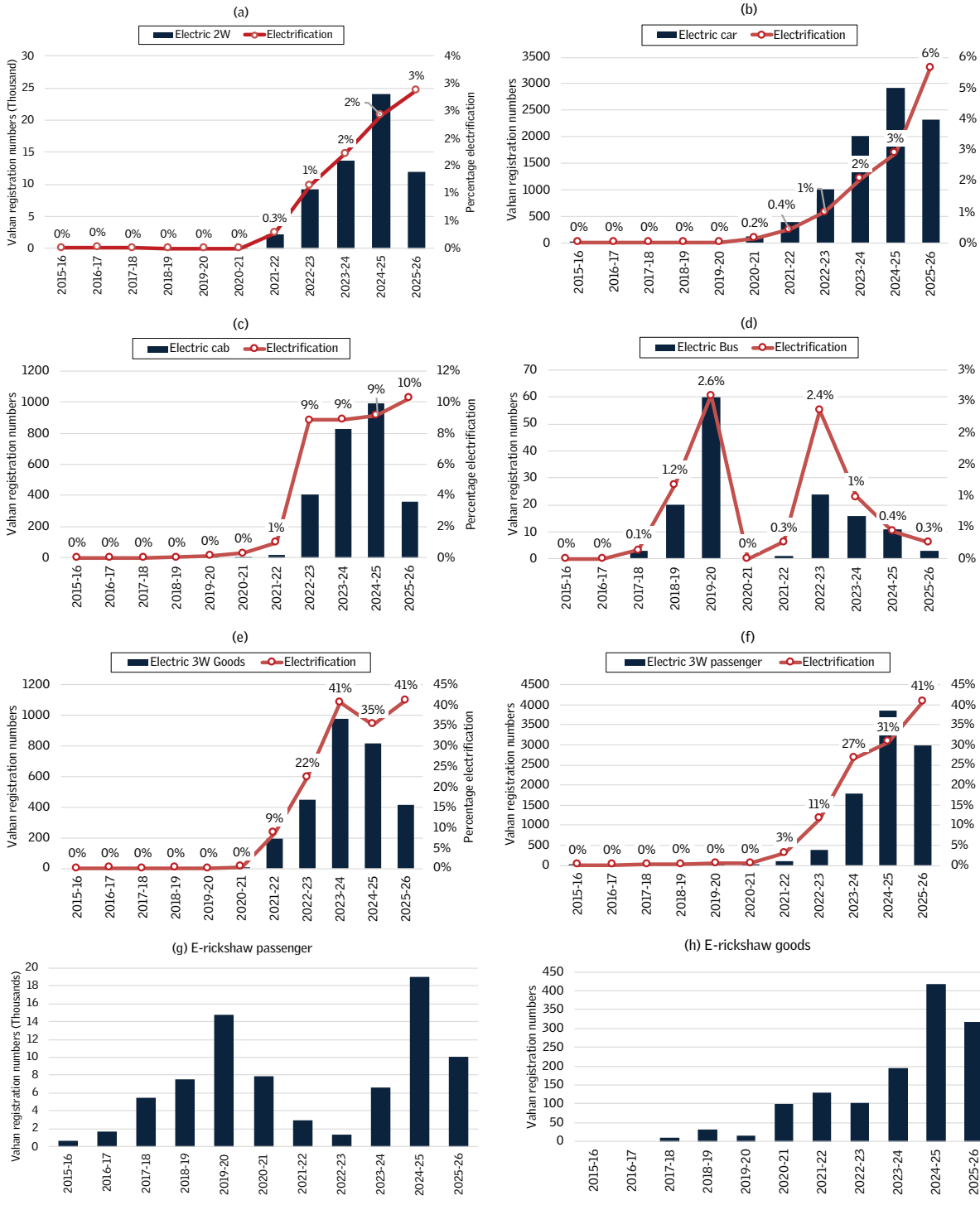
The regional pattern of electrification in West Bengal reflects both the state's geography and the distribution of its transport infrastructure. In 2024, the Regional Transport Offices (RTOs) of Paschim Burdwan, Durgapur, Howrah, Alipore and Siliguri recorded the highest number of registered electric two-wheelers, rather than the expected Public Vehicles Department (PVD) RTO in Kolkata.

By 2025, Alipore, Nadia, Howrah, Murshidabad and Siliguri led the state in registrations. These spatial shifts indicate that two-wheeler electrification is advancing most rapidly in the industrial-urban belts of south and central Bengal. This growth is driven by strong road connectivity and a robust dealer presence in these regions, rather than being concentrated solely within Kolkata.

Kolkata's relatively low two-wheeler BEV registration numbers—and those of the state overall—stem partly from administrative and behavioural factors. Original Equipment Manufacturers (OEMs) note that many residents, especially migrants from eastern and north-eastern states, lack the local address proof (e.g., voter ID, birth certificate, or passport) mandatory for vehicle registration. Consequently, low-speed electric two-wheelers (< 25km/h) that do not require registration dominate the city's informal mobility scene. Furthermore, high loan rejection rates due to weak credit profiles and documentation hurdles continue to constrain formal EV purchases.

To better identify where the transition is truly taking hold, we combined total BEV registrations with penetration percentages, using a geometric mean. This combined indicator provides a more accurate view of progress than either variable alone. For the two-wheeler BEV segment in 2024, Paschim Burdwan, Durgapur, Behala, Kasba and PVD Kolkata ranked highest. By 2025, Alipore, Durgapur,

Graph 6: West Bengal year-wise and vehicle segment-wise BEV registration numbers and BEV penetration



Data source: Vahan database (September 2025)

Paschim Burdwan, Nadia and Paschim Medinipur emerged as top performers. These rankings align closely with sales data from major OEMs like Ola, which report the strongest demand in areas combining industrial employment, middle-income consumers, and a relatively reliable electricity supply.

Private vs. commercial four-wheelers: For private cars, electrification remains concentrated in metropolitan RTOs—PVD Kolkata, Salt Lake and Alipore—where purchasing power and charging availability are highest. While peripheral RTOs like Mathabhanga (Cooch Behar) show high percentage penetration (13 per cent in 2024), this is skewed by very small sample sizes (six registered BEVs), highlighting why geometric-mean analysis is more representative.

The pattern in commercial cars mirrors this geography. PVD Kolkata continues to lead in absolute BEV numbers, while peri-urban RTOs such as Srirampur are catching up in electrification share as ride-hailing fleets and aggregator cabs gradually transition to electric.

Intermediate public transport (IPT): Trends highlight the dependence of smaller towns on three-wheelers where formal bus systems are limited. In 2024–25, e-rickshaws proliferated in Murshidabad, Purulia and Malda, while remaining prohibited in Kolkata city. In 2024–25, total three-wheeler passenger registrations across all fuels peaked in Alipurduar, Murshidabad, Nadia and Cooch Behar, while e-rickshaws proliferated in Murshidabad, Purulia, Jangipur, Basirhat and Malda (while they remain prohibited within Kolkata city).

Notably, BEV three-wheeler registrations are highest in Murshidabad, Alipurduar, Cooch Behar, Jalpaiguri, Nadia and Malda—districts in the north and east that rely heavily on IPT for daily mobility. However, the grid in these northern districts is comparatively weak; feeder lines are often insufficient to sustain large-scale charging, limiting fleet-scale electrification despite demand.

Conversely, Kolkata's three-wheeler segment still shows a preponderance of LPG vehicles, supported by the city's concentration of Auto-LPG Dispensing Stations (ALDS). With the number of ALDS outlets gradually declining, it is crucial that this segment's next transition be steered towards electric rather than CNG vehicles, given the absence of CNG infrastructure within the Kolkata Metropolitan Area.

Across all segments, the geography of registrations correlates closely with the state's public-transport density. Regions served by extensive bus networks—such as the SBSTC and NBSTC corridors in southern and northern Bengal—show lower

dependence on IPT, whereas areas with sparse bus coverage exhibit higher three-wheeler proliferation (see *Map 1: NBSTC and SBSTC bus services in West Bengal*). This interplay between formal and informal transport modes explains why RTOs in districts with weaker bus penetration or low-frequency routes (for example, Malda and Murshidabad) record higher three-wheeler activity overall.

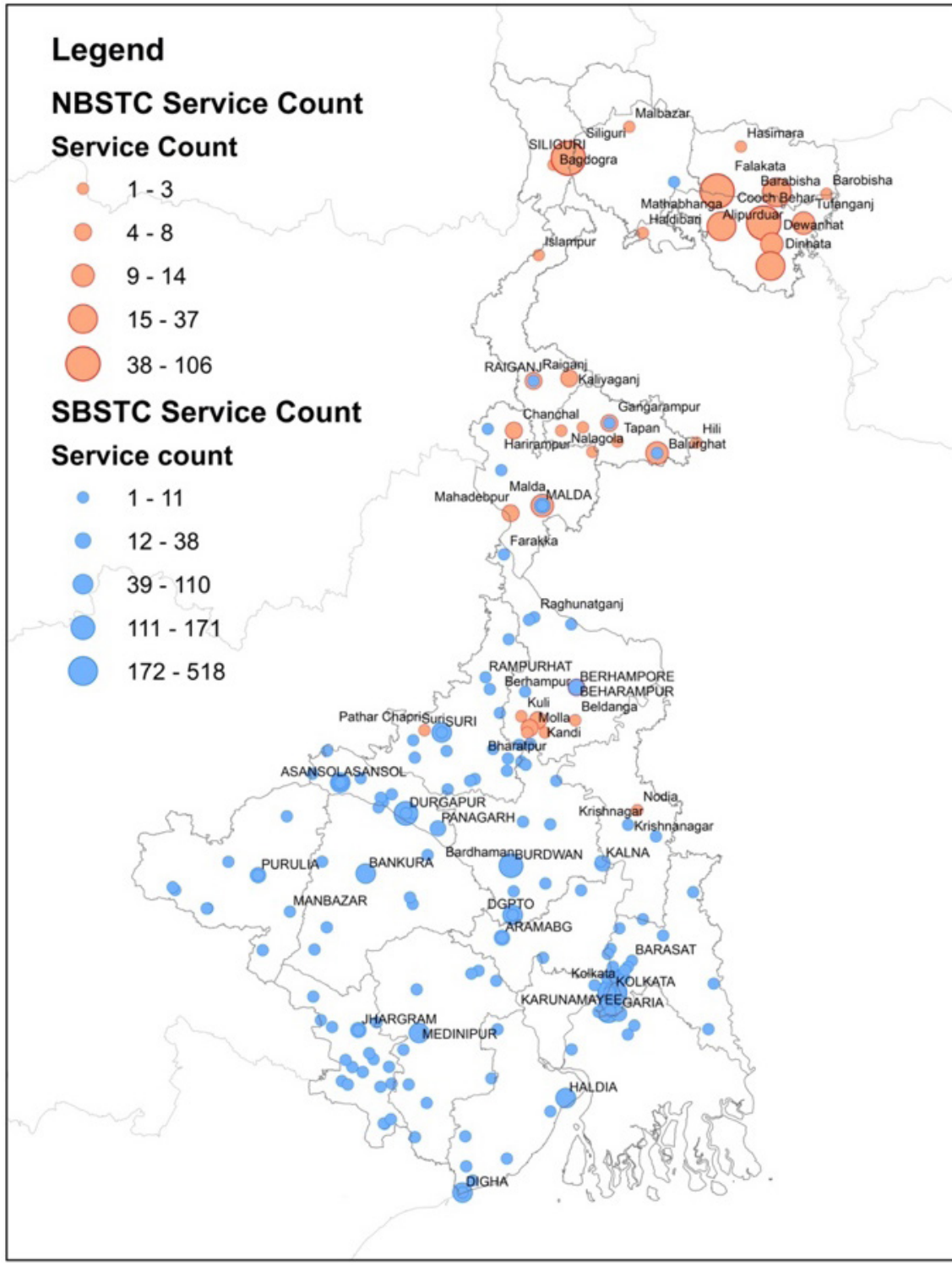
Unlike rapidly motorizing states like Maharashtra or Karnataka, West Bengal's electrification pattern is more reflective of public-transport coverage and power-infrastructure readiness than raw consumer demand. Strengthening bus services and their electrification—identified by NITI Aayog as 'low-hanging fruit'—could serve as the backbone for broader zero-emission mobility across the state.[3] Future investment should prioritize hub-based charging infrastructure in high-demand corridors instead of uniform dispersal, particularly in districts where both demand and grid capacity are currently constrained.

Passenger e-aggregator services for cleaner commute: Electric aggregator services in Kolkata are currently in their early stages of development. Snap-e, one of the city's largest electric fleet operators, has provided fully electric vehicles for commuters since its inception in 2022. Snap-e operates under an asset-heavy model, owning and maintaining its fleet of approximately 1,100 electric cabs for daily operations across the city. To expand its charging infrastructure, Snap-e has partnered with India Power Corporations Limited (IPCL) and Reliance BP to establish exclusive charging hubs in the New Town area. Currently, the company operates from nine hubs, with a significant presence in the Salt Lake and Rajarhat areas.

Other vital stakeholders include e-commerce giants (e.g., Amazon, Flipkart), app-based ride-hailing services (Snap-e, Uber, Ola), food and parcel delivery platforms (Swiggy, Zomato), and various logistics providers. Their fleet decisions—specifically whether to deploy EVs or Internal Combustion Engine (ICE) vehicles—are critical to the state's EV adoption goals. The West Bengal EV policy identifies 'model electric mobility cities', such as Kolkata, Asansol, Darjeeling and Howrah, where electrification efforts and infrastructure for electric buses and freight corridors are prioritized. Their fleet decisions such as whether to deploy EVs or conventional vehicles can make or break the state's EV adoption goals.

Comparative fleet models: Snap-e vs. Everest Fleet, Snap-e attracts a broad customer base by offering both Business-to-Business (B2B) corporate services and Business-to-Consumer (B2C) ride-hailing. The company employs drivers on a combined fixed and variable (incentive-based) compensation structure. Under this

Map 1: NBSTC and SBSTC bus services in West Bengal



Source: NBSTC and SBSTC web portal

model, drivers are not permitted to decline travel requests, which has enhanced commuter confidence and led to a growing customer base.

In contrast, Everest Fleet, a pan-India service provider, operates a fleet of 3,000–4,000 vehicles in West Bengal, of which approximately 10 per cent are electric, 25–30 per cent run on CNG, and the remainder are ICE vehicles. Unlike Snap-e, which uses its own digital app, Everest Fleet partners with Uber for customer acquisition, operating its electric fleet under the Uber Green brand.

Challenges in the individual driver segment: Unlike dedicated fleet operators, individual passenger aggregator services like Ola and Uber have seen little transformation in recent years. According to a manager at an Ola/Uber driver acquisition centre in Chinar Park, Kolkata, which coordinates approximately 1,800 individual drivers, only 20–25 currently operate electric cabs.

Interviews with individual drivers reveal several hurdles limiting expansion at the owner-operator level:

- Infrastructure and cost: A lack of charging infrastructure and high upfront vehicle costs remain primary barriers.
- Asset value: Concerns regarding the unknown resale valuation of second-hand EVs discourage investment.
- Performance and awareness: Poor performance from first-generation EVs and a lack of awareness regarding technological progress have created a negative impression. Consequently, many drivers are choosing CNG for their next vehicle transition instead of electric.

To build confidence in the EV segment, drivers in Kolkata recommend several regulatory transformations:

- **Public infrastructure**: Creating a supportive ecosystem of public charging hubs across the city.
- **Fiscal incentives**: Providing extended incentives such as waivers on registration fees, motor vehicle taxes or permit charges.
- **Operational advantages**: Allowing preferential parking for electric vehicles at key locations.

A strong, clear government mandate can catalyse a rapid transformation in the ride-hailing and e-aggregator sectors. Establishing long-term targets will help attract more private investment into the sector, mirroring the successful transition seen in Delhi.

Transitioning electric delivery services: Delivery activities in West Bengal are rising. Recently, state has granted industry status to the logistics sector,[4] a policy step intended to attract warehousing and third-party logistic investments, a direct enabler of more and faster deliveries into Kolkata. This includes large investments by e-commerce firms and new warehouse/last-mile hubs in the region.

Currently, operational model of all these e-commerce and food delivery services is that they create small neighbourhood hubs to serve 3–4 square km area for last-mile delivery. For example, in Kolkata, Blinkit, a fast grocery e-commerce platform, create a neighbourhood hub of 3 square km and each hub employs around 80–100 delivery personnel for last-mile service who travel roughly 100–130 km daily. However, out of 80 personnel at the Salt Lake Sector 1 hub alone, only two use electric bikes.

On an average each delivery personnel operates 115 km daily (50 per cent employees are on pay role and operate around 100 km a day while 50 per cent are contractual employees that operate around 130 km a day) which would translate to roughly 3.3 million km of travel per annum for the Salt Lake Sector 1 hub alone. Salt Lake area has three similar hubs, which can roughly translate to 10 million km per annum just by Blinkit. There are several such e-commerce operators like Swiggy, Zomato, Amazon and Flipkart operating in the not just Salt Lake but other urban neighbourhoods too.

A detailed investigation of delivery personnel not using electric bikes revealed the reasons behind low EV adoption in this sector—high upfront cost of vehicles compared to the similar petrol bikes, range anxiety, lack of charging facilities, unawareness about current models of electric vehicles and their performance etc. The majority of delivery personnel use their new petrol bikes of around 125 cc, with an upfront cost close to Rs 1 lakh per bike, for delivery. In contrast, a comparable current e-bike with 150–180 km range is available for Rs 1.25 to 1.5 lakhs. Thus, with the government support in terms of waiving registration fee, MV tax etc. these modern e-bikes can be made within the affordable range.

Furthermore, battery swapping technology could be a game-changer for those commuting from the Kolkata suburbs, provided the segment moves beyond slow-speed bikes that are currently deemed uncomfortable for professional use. Currently, swapping battery bikes are available only for the slow-bike segment (with speed less than 25 km per hour), which doesn't require any registration either. However, these bikes are neither comfortable nor desirable by delivery personnel. This segment is poised to transform—a small push in terms of government incentives and infrastructure support and mandate can transform it swiftly.

3.3. Electrification of bus segment

West Bengal emerged as a pioneer in the swift electrification of public transport under the first phase of the Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) scheme. Of the 425 electric buses funded nationwide in 2017, Kolkata secured 80 units—nearly 19 per cent of the total allocation. This was the highest share among the nine cities eligible for FAME-1 funding.

Consequently, the state began operating e-buses within Kolkata in 2019. Utilizing the flexibility offered by FAME-1 regarding operational business models, the state opted for a traditional ownership model. Under this framework, the state purchased the vehicles directly from Original Equipment Manufacturers (OEMs) and managed both operations and maintenance using its own workforce.

Furthermore, while the West Bengal State EV Policy of 2021 did not set a specific quota for bus electrification, the state has remained committed to its green transition. Most recently, it procured an additional 30 electric buses under the FAME-2 scheme, transitioning to a Gross Cost Contractual (GCC) model. Because the FAME-1 guidelines allowed for regional flexibility in business models, West Bengal chose the traditional ownership path: purchasing the buses from OEMs and handling all operations and maintenance internally.

Even without a specific target for bus electrification in the 2021 State EV Policy, the momentum has continued. Under the FAME-2 funding phase, the state expanded its fleet by another 30 buses, this time adopting a Gross Cost Contractual model to further its electrification journey.

Bus infrastructure development: To bolster the e-bus ecosystem, the state has modernized existing infrastructure by establishing charging facilities at 10 key locations. These include nine West Bengal Transport Corporation (WBTC) depots across Kolkata—specifically Thakurpukur, Kasba, Howrah, Lake, Belgachia, Salt Lake, New Town, Gariahat, and Nonapukur—along with one South Bengal State Transport Corporation (SBSTC) facility in Digha. Each of these ten depots is equipped with at least one DC fast charger. Furthermore, eight of these depots feature six DC slow chargers each, while the Nonapukur and Digha depots are equipped with seven and one slow chargers, respectively. To ensure smooth daily operations and support 'opportunity charging' along active routes, state authorities have also installed fast-charging facilities at major terminals, including Howrah Station, Garia, New Town and Karunamoyee.

Procurement and policy shifts: In 2022, the state participated in the Grand Challenge, India's first initiative for aggregated procurement of electric buses aimed at improving price discovery. Under this scheme, a Letter of Award was issued for a private operator to deploy 1,180 e-buses in Bengal via a Gross Cost Contract (GCC), which included operator-built chargers and per-kilometre payments by the state. While West Bengal initially planned to procure approximately 2,000 electric buses, the full rollout failed to materialize due to subsequent litigation and difficulties in execution. Consequently, the state has not procured any new electric buses since that period.

Instead, the state has shifted its focus toward procuring over 200 new CNG-fuelled buses under the National Clean Air Programme (NCAP). This strategic pivot was driven by several factors, including the underwhelming performance of first-generation electric buses and the growing financial strain on the West Bengal Transport Corporation (WBTC) in managing electric fleets. These operational and maintenance challenges have prompted decision-makers to re-evaluate their electric bus roadmap in favour of an alternative fuel strategy.

Strategic pivot and operational strain: Currently, the state has shifted its focus toward procuring over 200 new CNG-fuelled buses under the National Clean Air Programme (NCAP). This strategic pivot stems from several factors: the underwhelming performance of first-generation electric buses, the mounting financial burden on the WBTC in managing electric fleets, and ongoing maintenance challenges. These hurdles have prompted decision-makers to re-evaluate their electric bus roadmap in favour of an alternative fuel strategy.

This shift in strategy presents significant concerns for the state's green transition. Unless West Bengal promptly resumes its ZEV transition for public transport, it risks being locked into another decade of reliance on CNG vehicles. Such a move requires costly infrastructure investment that may become redundant within the next ten years, while simultaneously increasing dependence on imported natural gas. This also increases the risk of stranded assets.

Crucially, natural gas is more effectively utilized in West Bengal's 'hard-to-abate' manufacturing sectors, which currently rely heavily on coal. In the transport sector, electricity already provides a cleaner, more efficient, and more reliable pathway toward sustainability.

Need for a clear mandate: Over the last decade, the corporation's fleet size has shrunk from 1,800 to 1,400, a loss of approximately 22 per cent. Half of the present

fleet is already older than ten years of age (i.e. 650 buses were procured in FY 2014–15) and 90 per cent of the remaining buses (around 600 buses) have already reached the age of eight years (procured in FY 2017–18).

Generally, the WBTC retires buses once they reach eight years or 4,00,000 kilometres of service. While many buses remain in operation because they have not yet hit the mileage threshold, conservative estimates suggest the WBTC must replace almost its entire fleet within the next five to seven years just to maintain current service levels. WBTC has to augment almost its entire existing fleet of buses just to maintain the current level of service delivery, leave aside improving its service coverage with the ever-increasing demand for travel in the city. Linking this replacement with zero-emission electric buses needs to be the priority focus.

The state has a poor first-hand experience with first batch of e-buses, which is true for all other Indian cities as well. This experience only helped cities to move into the current phase. Cities like Bengaluru, which were initially reluctant to move towards gross cost system, are now embracing GCC for e-bus operations whole heartedly.

Currently, the entire country is moving towards a transition to e-buses, so the overall e-bus operational costs (particularly after demand aggregation) are going down. Total cost of ownership TCO of e-bus operations in the country has reached a number which is even better than operating ICE buses under gross cost model. In this juncture, moving towards e-buses will not only provide WBTC some breather, but will help the corporation improve the image of the state's public bus services as well. As across the country, these modern-looking AC electric buses have renewed the enthusiasm in people to use buses again, and West Bengal should not lose this opportunity.

3.4. Consumer awareness

Overall, BEV adoption in the state remains low despite various policy measures. A 2024 user perspective survey revealed that BEV awareness in Kolkata is also poor–only 38 per cent of potential buyers were aware of the central FAME subsidy, and about half did not know about state-level tax and fee exemptions.[5]

Even with these gaps, more than 65 per cent of surveyed respondents in Kolkata expressed interest in purchasing an EV, with a notable preference for swappable-battery models compared to other cities where fixed-battery EVs dominated.[6]

To understand user preferences and options better, the next section takes a closer look at the segment-wise OEMs (Original Equipment Manufacturer) offering BEV models in the state.

Despite low current adoption, there is significant potential for a revitalized e-bus transition. Across India, modern AC electric buses have renewed public interest in transit, and the Total Cost of Ownership (TCO) for e-buses has now dropped below that of Internal Combustion Engine (ICE) buses under the GCC model.

Lowering of total cost of ownership to enable higher uptake

Over the past decade, the total cost of ownership (TCO) for electric vehicles in India has improved dramatically across all major segments, steadily closing the gap with internal combustion engine (ICE) vehicles. Several factors such as sharp declines in battery prices, lower operating and maintenance costs for EVs, and supportive government policies (national and state level) drove this shift. Batteries can constitute around 40 per cent of an EV's upfront cost, so the 80–85 per cent drop in lithium-ion battery pack prices since the mid-2010s (to about USD 115 per kWh in 2024) has been pivotal.[7, 8] This, combined with subsidies (FAME I in 2015, FAME II in 2019) and tax incentives, has substantially reduced purchase prices and improved lifetime economics. Meanwhile, electricity is far cheaper per km than petrol or diesel, and EVs have lower routine maintenance, further re-routing the economics in favor of EVs over time.

Two-wheelers: In 2015, electric two-wheelers (mostly low-speed e-scooters) were relatively expensive with limited range, making their TCO higher than petrol scooters for most users. Over ten years, technology improvements and economies of scale have slashed costs. By the early 2020s, many electric scooters and bikes achieved TCO parity with conventional two-wheelers, even before accounting for recent subsidies.[9] The FAME schemes played a key role. FAME I (launched 2015) provided modest upfront subsidies, and FAME II (2019) was a larger programme that, among other incentives, dramatically reduced effective two-wheeler prices. In June 2021, for example, FAME II incentives for e-two-wheelers were increased to Rs 15,000 per kWh (from Rs 10,000) and the cap doubled to 40 per cent of the vehicle cost.[10] This policy inflection point reduced upfront cost and accelerated sales.

State-level incentives amplified the effect, 100 per cent road-tax and registration fee exemptions in West Bengal further lowered upfront costs, advancing price parity timelines by one to two years. Due to these developments, the typical five-year and even ten-year TCO for an electric two-wheeler is now lower than for an

equivalent petrol two-wheeler in most scenarios.[11] Consumers save significantly on fuel—an electric scooter's energy cost may be only Rs 0.15–0.30 per km versus around Rs 1.5–2 per km for a petrol scooter and benefit from simpler, cheaper maintenance. As a result, electric two-wheelers are already cheaper on a TCO basis than their fossil-fuel counterparts, making this segment a frontrunner in India's e-mobility transition.[12]

Three-wheelers: India's auto-rickshaw and three-wheeler segment has seen one of the fastest TCO crossovers. By the mid-2010s, rudimentary e-rickshaws with lead-acid batteries had begun penetrating the market due to their low running costs. In the last ten years, improved lithium-battery electric three-wheelers have solidified a cost advantage. Electric autos have higher upfront prices than diesel or CNG three-wheelers, but their fuel and maintenance savings are so large that the break-even is reached quickly. The International Energy Agency (IEA) notes that an electric three-wheeler in India can achieve TCO parity with a CNG autorickshaw within just two years of purchase with current subsidies, or roughly four years without subsidies.[13] Another 2025 analysis likewise finds that electric three-wheelers are the lowest-cost option: about Rs 1.28 per km in TCO, versus Rs 2.35 for CNG, Rs 2.69 for diesel, and over Rs 3 per km for a petrol three-wheeler.[14] Key drivers have been the decline in battery prices, the low cost of electricity (often Rs 6–8 per kWh for charging, translating to a few paise per km), and incentives under FAME II (which offered purchase subsidies for e-three-wheelers as well). Many states, including West Bengal, also waived permit requirements for e-rickshaws and offered financial incentives, spurring rapid adoption.

Cars (four-wheelers): Electric cars in India have seen substantial TCO improvements since 2015, though parity with conventional cars is more nuanced and typically hinges on usage patterns. A decade ago, early BEV models like the Mahindra e2O or first-generation electric sedans were extremely expensive (and limited in range), resulting in much higher ownership costs than petrol/diesel cars without heavy subsidies. Since then, battery costs per kWh have plummeted and new mass-market EV models (such as those by Tata Motors) have entered the market at more competitive prices. The government reduced GST on EVs to 5 per cent (versus 28 per cent for ICE cars) and FAME II provided purchase rebates for electric taxis, lowering the effective cost of ownership. By the mid-2020s, these measures have shrunk the cost gap considerably.

The analysis carried out by the International Council on Clean Transportation (ICCT) finds that over an eight-year ownership, certain electric car models in

India have started to achieve TCO parity with their gasoline counterparts even without subsidies.[15] However, a major hurdle remains the upfront price: EV cars still cost roughly 1.3–1.7 times as much as similar ICE cars in purchase price, a significant barrier in a price-sensitive market.[16] This means that TCO parity for cars is mostly realized in high-mileage use cases. Studies indicate an EV car needs to be driven around 40–60 km per day for the fuel and maintenance savings to outweigh its higher upfront cost.[17] In practical terms, commercial fleets (e.g. app-based cabs or corporate taxis that run long daily distances) already find many EVs economical, while private owners with lower daily use may not recoup the price premium as quickly. And, TCO parity for personal cars in India tends to occur only over a longer time period or with incentives.

4. Status of charging infrastructure

The West Bengal State EV Policy sets an ambitious target of installing at least one lakh charging stations across the state, aiming for a charging point to BEV ratio of 1:8 by the end of the policy term. However, the ground reality in West Bengal, particularly Kolkata, reflects a far more complex picture. With West Bengal's EV adoption on a gradual rise – establishing a robust network of charging stations is indispensable to achieve and maintain customer confidence in BEVs.

West Bengal's public transportation electric vehicle (EV) charging ecosystem is currently anchored by the modernization of 10 primary depots. These include nine West Bengal Transport Corporation (WBTC) facilities—Thakurpukur, Kasba, Howrah, Lake, Belgachia, Salt Lake, New Town, Gariahat and Nonapukur—and one South Bengal State Transport Corporation (SBSTC) depot in Digha.

Each location features at least one DC fast charger. Specifically:

- Standard depots: Equipped with six DC slow chargers each.
- Nonapukur depot: Features a higher capacity of seven slow chargers.
- Digha depot: Operates with a single slow charger.
- Terminal support: To facilitate 'opportunity charging' on active routes, fast-charging facilities have been installed at major terminals like Howrah Station, Garia, New Town and Karunamoyee.

By November 2025, the state had approximately 1,200 operational public and private chargers though these remain heavily concentrated within the Kolkata metropolitan region.

4.1. Charge point operators (CPOs)

The West Bengal State EV Policy establishes an ambitious target of installing at least 1 lakh charging stations across the state, aiming for a charging point-to-BEV ratio of 1:8 by the end of the policy term. However, the ground reality in West Bengal—and specifically in Kolkata—presents a far more complex picture.

While Kolkata and its surrounding areas are witnessing a steady expansion of charging infrastructure, West Bengal's overall adoption is rising only gradually. Establishing a robust network of stations is indispensable for building and

maintaining customer confidence in BEVs. Currently, infrastructure is concentrated within the Kolkata metropolitan region, with a primary focus on key zones such as the city centre, Salt Lake (Bidhannagar) and New Town (Rajarhat), which host the majority of the state's charging facilities.

Kolkata and its neighbouring hubs, Salt Lake and New Town, have seen a surge in activity as multiple entities establish EV charging stations. Local government authorities have taken a proactive role in this rollout; the Kolkata Municipal Corporation (KMC) and the New Town Kolkata Development Authority (NKDA) together operate approximately nine public charging stations across the city. Notable examples include KMC's charging point under the Maa Flyover near Park Circus in central Kolkata and NKDA's units in New Town, such as the station at Jatragachi in Action Area I.

Beyond these government-led initiatives, the majority of the region's chargers are managed by private charge point operators (CPOs). This diverse mix of stakeholders—ranging from public agencies and power utilities to oil companies and tech start-ups—illustrates a rapidly developing ecosystem. While the involvement of KMC and NKDA ensures a critical baseline network in high-traffic zones, private CPOs are instrumental in scaling the infrastructure by aggressively filling remaining gaps with their own installations.

To support this growing network, the state has already modernized existing depots and terminals to facilitate various charging needs:

- Depot modernization: Charging facilities are operational at 10 strategic locations, including nine WBTC depots in Kolkata and one SBSTC depot in Digha.
- Technical specifications: Each of these ten depots features at least one DC fast charger; eight depots are equipped with six DC slow chargers each, while Nonapukur and Digha house seven and one slow chargers, respectively.
- Operational support: Fast-charging facilities have been established at key terminals—Howrah Station, Garia, New Town and Karunamoyee—to support 'opportunity charging' for buses on active routes.

Spotlight on New Town and Salt Lake

New Town (**Rajarhat**) has established itself as the primary focal point for electric vehicle (EV) infrastructure in greater Kolkata. New Town (managed by NKDA) has emerged as the state's model for EV infrastructure, hosting roughly 30 stations by late 2022, with continuous expansion through 2025.

By late 2022, approximately 30 charging stations were active across the area, including installations by the government (West Bengal Housing Infrastructure Development Corporation [HIDCO]/New Town Kolkata Development Authority [NKDA]) and various private operators. This network continues to grow as NKDA adds new stations. Strategically distributed across Action Areas I, II and III, these chargers are typically situated in high-traffic or prominent locations to maximize accessibility. Its success is built on placing of chargers in highly visible, convenient locations.

NKDA has identified 12 new sites for fast chargers located in high-visibility public areas. These stations are being integrated into curb-side parking bays and designated spots along main roads, designed for ease of access similar to traditional petrol pumps. Key planned and existing locations include:

- Strategic siting: Chargers are positioned at high-traffic hubs such as Axis Mall, Eco Park (Gate 4), and the Biswa Bangla Convention Centre. At the Akanksha crossing (6th intersection) and near the Chittaranjan National Cancer Institute in DJ Block. Near the New Town School in DB Block.
- Public–private mix: Infrastructure includes government-run units by the NKDA and EESL, alongside private networks like Jio-BP Pulse and Statiq.
- Retail hubs**:** A station located behind City Centre II Mall (near Professor Shanku Park) and another beside Spencer's supermarket in the Shukhobrishti area.
- Residential complexes: Chargers serve large communities near Rosedale and Uniworld City.
- Malls and markets: A station is located behind City Centre II Mall (near Professor Shanku Park), with another beside the Spencer's supermarket in the Shukhobrishti area.
- Petrol pumps: A growing number of traditional petrol pumps are incorporating EV facilities. For example, the HPCL fuel station at Akanksha (Action Area I) hosts an EESL-run charger (Bharat DC-001). Other IOC and HP stations along the arterial roads are either equipped or slated to receive units—typically one slow AC and one fast DC charger per government guidelines.

Beyond private vehicles, New Town has made significant provisions for public transit and commercial fleets. Heavy-duty charging stations equipped with high-power connectors (such as CCS2 or GB/T for buses) are located at key transit points:

- Action Area I: A fast charger at the New Town Bus Terminal near Pride Hotel.
- Action Area III: Facilities at the AA-III Bus Stand (near Shukhobrishti) and near the Eco Urban Village.
- Transit hubs: Fast chargers are installed at the New Town Bus Terminal (Action

Area I) near Pride Hotel, the AA-III Bus Stand near Shukhobrishti, and near the Eco Urban Village.
- Multi-vehicle use: While designed for buses, these stations often have ports available for smaller vehicles during off-peak times.
- Fleet operations: EV cab companies like Snap-E and Everest Fleet maintain their parking and charging hubs in New Town. Notably, Snap-E is constructing a 300-charger 'ultra-hub' in South Kolkata for further expansion.

New Town now possesses a robust charging map with stations at regular intervals. Moving forward, the NKDA is reserving space in new multi-level parking garages, ensuring future markets and office complexes are equipped with EV charging bays by design. Overall, New Town's model of integrating chargers into both public infrastructure (streets, parks, depots) and private developments (malls, housing) serves as a blueprint for scaling urban charging networks.

In New Town, government-run fast chargers are priced at a subsidized rate of Rs 12–13 per kWh to encourage adoption, significantly lower than the Rs 15–25 rates seen in central Kolkata.

Salt Lake (**Bidhannagar**) serves as a major IT and residential hub, yet its public charging network remains less dense than that of neighbouring New Town. Most charging infrastructure here is integrated into existing facilities—such as office parking lots, malls, hotels and petrol stations—rather than being available as standalone curb-side units.

Its key charging locations include:
- Sector V (IT district): A prominent fast-charging option is the Jio-BP Pulse station, typically located within a Jio-BP fuel outlet.
- Corporate hubs: Several tech parks and office complexes provide charging facilities for staff and visitors. A notable example is the Statiq-managed EV charger located within the Cognizant Technology Complex.
- Two-wheeler support: For electric scooter users, at least one AtherGrid point is available in the broader Salt Lake area, specifically on VIP Road near Raghunathpur.

While Salt Lake's expansive residential blocks currently lack a significant number of publicly accessible street-side chargers, the landscape is changing. Private slow-charging points are becoming increasingly common within apartment complexes and housing societies. For now, public users primarily rely on chargers located within the parking areas of commercial buildings or at traditional fuel pumps.

CHARGING PROVIDER IN THE STATE OF WEST BENGAL

- **Tata Power EZ Charge:** A leading private CPO, operating AC and DC chargers nationwide. In Kolkata, Tata Power has stations like a fast or slow charger unit on Park Street,[18] and it has partnered with local sites such as hotels to host chargers (for example, the ITC hotels in the city have Tata Power fast chargers).
- **Energy/oil companies:** Indian Oil Corporation (IOCL) has set up multiple EV charging points at its fuel stations in Kolkata. These are typically Bharat DC-001 or Type-2 AC chargers installed on petrol pump premises, accessible to the public. Shell has also introduced Shell Recharge fast chargers (e.g. along the E.M. Bypass in East Kolkata).[19]
- **Jio-BP Pulse** (the Reliance-BP joint venture) operates DC fast chargers and fleet charging stations (mix of fast and slow chargers), including a unit in Salt Lake Sector V and others likely at Jio-BP fuel outlets. These oil-company initiatives leverage existing gas station networks for EV charging convenience.
- **Government joint venture and public sector:** Energy Efficiency Services Ltd (EESL), a public energy service company, has deployed several chargers in New Town. For example, an EESL station is located at the Akanksha More HP petrol pump in New Town, and others near the New Town bus terminals. These installations came under Central schemes (FAME) and are maintained via public–private partnerships.
- **Automotive OEM networks:** Vehicle manufacturers and their dealers have also installed chargers to support customers (often opened for public use). For instance, a Hyundai dealership (Mukesh Hyundai) in Kestopur, near Salt Lake, has a public Type-2 mid-speed charger.[20] MG Motor and Kia have set up chargers at their showrooms in Kolkata, e.g. the Kia dealership in New Town's Action Area II hosts a charger for 4-wheelers.[21] These are primarily AC chargers (7–22 kW) meant for cars.
- Even two-wheeler OEMs are involved. A Hero Electric outlet in New Alipore offers an EV charging station to serve e-scooters and e-bikes. Ather Energy, which sells electric scooters, operates a few AtherGrid fast-charge points (typically 3–5 kW) at popular locations (malls, cafes) in the city, including spots in Salt Lake and Park Street (though small, these are crucial for two-wheeler users).
- **Independent charging networks:** Several EV charging start-ups and dedicated CPOs have a presence in the region. Statiq, for example, operates about 24 public charging stations in Kolkata (offering both AC and DC fast chargers),[22] including units in New Town and at IT parks.
- Sunfuel runs a station at the Holiday Inn hotel near Kolkata Airport (New Town). ChargeZone has at least one station in the metro area (a site in Howrah offering AC and DC charging).[23] Terra charge, initially offering business-to-government and public charging stations has now switched its business model to installing charging stations in RWA sites. Other CPO startups like EVRE, Magenta and Zeon (which are active in other states) have begun exploring West Bengal via partnerships, though their footprint in Kolkata is currently limited. Notably, many of the smaller stations are integrated through software platforms (for instance, the NKDA's public chargers are all on a common network managed by ElectreeFi software), making them visible on aggregator apps despite being run by different entities.

4.2. Charging tariffs and charger types

The cost to charge an EV in Kolkata depends on the operator and the charger's power level, but recent policies aim to keep these tariffs reasonable and uniform. Broadly, AC slow charging is cheaper per unit of electricity, while DC fast charging costs more per unit, reflecting the convenience and higher equipment cost (see *Table 4: Typical tariffs in the Kolkata region are categorized by the charging speed and the type of operator [as of the mid-2020s]*).

Table 4: Typical tariffs in the Kolkata region are categorized by the charging speed and the type of operator (as of the mid-2020s)

Charger type	Typical tariff (per kWh)	Details
Slow/AC charging	Rs 10–15	Applies to Level-2 chargers (up to 7 kW or 22 kW Type 2). Government-run points (KMC/NKDA) usually charge around Rs12, while private points at hotels or malls may charge up to Rs 15.
Fast/DC charging	Rs 18–25	Applies to 15–50 kW CCS/CHAdeMO units. Most private fast chargers range from Rs 17–18, with some exceptions reaching Rs 20–22.

Source: Compiled by CSE

To encourage adoption, NKDA announced that charging at its new government-run fast stations will cost only about Rs 12–13 per kWh. This significantly undercut the private rates. This subsidized tariff (nearly at cost) is meant to encourage usage. It's possible thanks to government support and the special EV electricity tariff category. Overall, commercial fast-charging rates in the city tend not to exceed Rs 20–22 per unit after the latest guidelines, making EV fuel costs much lower than petrol on a per-km basis.

To prevent price gouging and encourage uniformity, the Union Ministry of Power in September 2024 issued revised guidelines introducing a uniform EV electricity tariff for public charging, capped at the average cost of power supply (for the distribution utility) until March 2028.[24] In West Bengal, Charge Point Operators (CPOs) pay a dedicated EV tariff of approximately Rs 5.5–7 per kWh, to which they add a service margin.

In practice, this means the price CPOs pay for electricity is controlled—many states (including West Bengal) offer a dedicated EV tariff for charging stations at around Rs 4.5–12 per kWh (much lower than regular commercial tariffs). CPOs then add a service margin to this.

The Ministry's guideline ensures this margin doesn't balloon unfairly. As a result, we are seeing convergence of tariffs—most public chargers across providers are

clustering around the Rs 12–18 per kWh range in Kolkata. Indeed, some operators offer subscription or membership plans that further reduce effective cost (e.g. pay a monthly fee for lower per-kWh rates), though for casual users, pay-as-you-go is the norm.

As of mid-2024, the state noted that Kolkata had only a few hundred private EVs on its roads, attributing slow uptake partly to inadequate charging infrastructure. In response, the state's strategy has included inviting private charge point operators (CPOs) and other investors to participate. The policy specifically states that CPOs will be invited to set up charging infrastructure across the state and incentivized through low lease rentals on public land.

This means agencies like HIDCO (which manages New Town) or urban local bodies can offer land or parking spaces at concessional rates to companies willing to install public chargers. Such public-private collaboration is essential to reach the ambitious target of 100,000 charging points. Indeed, West Bengal's approach has been to make investment in charging more attractive by reducing upfront costs (cheap land leases, streamlined permissions via the EV cell, and assured electricity supply at regulated tariffs).

However, consultations with the CPOs, both big and small, has revealed some gaps in the promises claimed by the policy and the ground reality. Terra's (a CPO) experience in Kolkata highlights the complex realities of India's EV charging market. Initially, the company tried to replicate its Japan and Indonesia business models, focusing on public and fleet-hub charging (B2G and B2B), but had to abandon them due to weak demand. It has since pivoted to installing chargers in residential areas and RWAs, a segment that, while growing, faces its own hurdles.

Obtaining multiple NOCs before accessing an EV tariff is a major bottleneck, with fire-safety approvals alone requiring expensive assessments by certified experts. The delays have led some operators to use existing residential connections instead, paying societies Rs 7–8 per unit and charging customers Rs 13–14 per unit. Societies keep Rs 1–2 per unit as commission, while CPOs earn Rs 3–4 per unit. Technical constraints also limit installations to slow chargers in older buildings. Former Terra staff suggest mandating that all new housing projects include EV-ready connections with direct EV tariff access to simplify approvals and reduce costs.

Low profit margins have discouraged large players such as Reliance BP from entering the RWA segment, which suffers from low utilization and high maintenance needs. Technicians often need to visit sites two to five times a month,

eating into profits. For smaller CPOs, Kolkata remains a difficult market: demand is weak, tariffs are steep, and costs are high. CESC's EV tariff in Kolkata is Rs 6–7 per unit, while WBSEDCL charges Rs 6 (peak) and Rs 5.5 (off-peak). In contrast, Delhi, and Bengaluru offer rates around Rs 4.5.

Thus, despite policy support, CPOs face significant hurdles. Initially, companies like Terra attempted public and fleet-hub models (B2G/B2B) but pivoted to residential areas and Residents' Welfare Associations (RWAs) due to weak initial demand. However, the RWA segment faces its own challenges. Some operators bypass these delays by using existing residential connections, paying societies Rs 7–Rs 8 per unit and charging customers Rs 13–Rs 14 (with societies keeping Rs 1–Rs 2 as commission).

Low profit margins have discouraged large players like Reliance BP from the RWA segment, which suffers from low utilization and high maintenance needs, often requiring technicians to visit sites two to five times a month.

4.3. Challenges

Capital costs and financial strain: The high capital requirements for EV infrastructure in West Bengal have placed a significant strain on operators. Security deposits in the state are in the range of Rs 7,000–8,000 per kW, which is drastically higher than the Rs 1,500 required in Delhi. Furthermore, CPOs are responsible for funding their own HT lines and transformer setups. Requirements from WBSEDCL for dedicated meter rooms further increase expenses, bringing the total investment for a 250 kW project in Kolkata to approximately Rs 87 lakh—nearly four times the Rs 23–25 lakh required in Delhi. Additionally, even public stations are forced to pay commercial tariffs for two months while awaiting official EV tariff approval, which erodes any initial savings from free backend support.

Extended break-even periods: Due to these high costs, the typical break-even period of two and a half to three years has extended to five to seven years in West Bengal. Consequently, only large corporations like Reliance and Tata remain actively involved, aiming for long-term market consolidation. Pricing structures also vary significantly by location: in New Town, where higher utilization rates provide better returns, users pay Rs 10–15 per unit, while rates in central Kolkata range from Rs 15 to Rs 25 per unit.

Obstacles in site acquisition: Securing viable sites remains another major hurdle. Premium urban locations are either prohibitively expensive or unavailable, forcing CPOs to focus on planned zones like New Town or to co-locate within existing

facilities such as petrol pumps and parking lots. While recent state measures to reserve space in new developments and utilize government land (including power-substation plots) have provided some relief, obtaining site approvals still involves lengthy coordination with multiple agencies and various property owners.

Strategic gaps and implementation barriers: Despite the progress in urban areas, the state faces significant hurdles in scaling its EV strategy to meet the target of Rs 1 lakh charging stations.

Gaps in charging infrastructure: Despite ambitious targets, significant gaps remain in the state's charging network. The West Bengal Electric Vehicle Policy 2021 aimed for 10 lakh electric vehicles and 1 lakh charging stations by 2026. However, as of November 2025, only 1200 public and private chargers are operational.[25] Existing infrastructure is heavily concentrated within Kolkata and New Town, leaving other regions underserved.[26]

Private investment is deterred by low charger utilization rates, which also delays the development of a sustainable market for Charge Point Operators (CPOs). Significant delays occur in regulatory procedures and obtaining No-Objection Certificates (NOCs) from multiple departments, which slows deployment.

Financial and capital barriers*:* The financial landscape for CPOs in West Bengal is characterized by high upfront costs and a lack of direct state funding. There is lack of direct support. There is no dedicated state budgetary support or viability-gap funding to incentivize CPOs.

- **High connection costs:** CPOs report that connection levies from WBSEDCL are in the range of Rs 7,000–8,000 per kW. This is nearly four times higher than in EV-forward states like Delhi (Rs 1,500–2,000 per kW). These high connection fees inflate project capital expenditure, creating a substantial barrier for smaller CPOs.
- **Extended break-even periods:** High upfront costs and lower utilization mean the typical break-even point for a project in West Bengal is five to seven years, compared to just two and a half to three years in other regions .
- **Lack of direct funding:** There is currently no dedicated budgetary support or viability-gap funding (VGF) specifically designed to incentivize private CPOs.

Regulatory and operational challenges:

- **Approval delays:** Obtaining No-Objection Certificates (NOCs) from multiple departments remains a major bottleneck. For example, residential charging projects often face delays due to expensive and complex fire-safety assessments.
- **Procurement stalls:** Following the 2022 'Grand Challenge', work orders for

nearly 2,000 e-buses were stalled due to litigation. This has led to a strategic pivot toward CNG buses, risking 'carbon lock-in' for the next decade.

Geographic and technical constraints:

- **Regional disparity:** While the Kolkata–Howrah–New Town corridor has a strong grid, northern districts like Malda and Murshidabad suffer from feeder constraints that prevent large-scale charging deployment.
- **Residential integration:** Older urban buildings often lack the technical capacity for anything beyond slow chargers, making home-charging difficult for the majority of the population.

Municipal action: Municipal and urban bodies play a critical in identifying and allocating land. Municipal bodies are tasked with speeding up the identification of suitable sites and the allocation of land for charging infrastructure. In New Town, NKDA is integrating chargers into public infrastructure (streets, parks and bus depots) and private developments like malls and housing.

Access to electricity and grid strength

Electricity access varies significantly across the state due to differences in grid infrastructure. There is uneven distribution. Northern districts such as Malda and Murshidabad face feeder constraints that limit large-scale infrastructure deployment. Conversely, the Kolkata–Howrah–New Town corridor, served by high-capacity substations from CESC and WBSEDCL, remains the primary hub for EV adoption.

West Bengal's power sector is undergoing structural transformation under the Revamped Distribution Sector Scheme (RDSS) and CEA's renewable-integration roadmap. The state grid, operating with a surplus capacity margin and low peak utilisation, can absorb EV charging loads, especially during off-peak hours, without major reinforcement. The state grid operates with a surplus capacity margin and low peak utilization, meaning it can absorb EV charging loads—especially during off-peak hours—without requiring major reinforcements.

Every 1,000 electric buses or 10,000 e-3Ws can add stable off-peak demand of around 60–80 MW, improving DISCOM revenue recovery and reducing average cost of supply.

Strategic development of charging infrastructure will be critical to build consumer confidence. Standardized safety norms and connectors across public chargers increase user reliability and trust. This will also help to upscale **c**ommercial and

fleet operations. Upgrading residential building codes to make new constructions 'EV-ready' lowers the future costs and administrative hurdles (like NOCs) for home charging. Moreover, establishing curb-side charging in high-traffic urban zones like New Town and Kolkata provides essential access for those who cannot charge at home. A clear infrastructure roadmap provides long-term certainty for investors, ensuring a steady stream of vehicles to utilize the network. The charging infrastructure can be a strategic lever, offering concessional land leases to make private investment in stations more attractive. Increased infrastructure utilization improves revenue recovery for DISCOMs (like WBSEDCL), especially when charging occurs during off peak hours.

5. Addressing regulatory levers to drive fleet electrification

Building an EV market at scale requires moving beyond purchase subsidies to address long-term systemic readiness and market distortions. While initial incentives provide momentum, sustainable growth is driven by regulatory mandates, infrastructure density and innovative financial models.

Subsidies are temporary tools designed to bridge the initial price gap with internal combustion engine (ICE) vehicles, but they carry long-term risks. Perpetual aid can stifle innovation by reducing manufacturers' incentives to lower costs through technological breakthroughs. Reliance on subsidies creates dependency, making it difficult to phase them out without causing sales to stall. Experts note that governments lack the infinite capital needed to support mass electrification; the financier and consumer must eventually make the ecosystem viable. Subsidies often focus on limited vehicle segments rather than the entire supply chain, failing to address barriers like high financing costs, supply chain, battery circularity and reliable charging.

Even though demand incentives and state-level tax measures have enabled seeding of the EV programme in the state, there is a limit to future expansion of the incentive schemes. While national-level incentives are expected to continue for some more time with substantial restructuring—lowering of incentives for small format vehicles like two and three wheelers, but more consistent support for buses, commercial vehicles and trucks, and no incentive for personal cars. Additional state-level direct fiscal incentives may also not be possible.

There is, therefore, a growing interest in regulatory levers to drive the market. As purchase incentives phase out, regulatory instruments become the primary drivers for adoption. Some of these levers include ZEV mandates or progressively stringent mandates for manufacturers to produce a specific percentage of Zero-Emission Vehicles (ZEVs) include the following: expanding Corporate Average Fuel Efficiency (CAFE) norms to a wider range of vehicle segments to penalize high-emission production; operating mandates or establishing target timelines for 100 per cent electrification in specific categories, such as public transport, paratransit, and urban freight in major cities; and differentiated taxation or

implementing vehicle and fuel taxes based on environmental performance—such as higher road taxes or registration fees for ICE vehicles—to make EVs naturally more competitive.

To maintain fiscal health while scaling the market, governments can adopt 'revenue-neutral' models that fund incentives through penalties. These may include self-sustaining system where fees levied on high-emission ICE vehicles are used to offer rebates for zero-emission vehicle purchases; replacing traditional fuel taxes with distance-based charges, potentially tracked via satellite systems (GNSS/GPS), to recover lost tax revenue without discouraging EV adoption; simultaneously increasing taxes on petrol/diesel vehicles while subsidizing EVs to redistribute value within the existing automotive GDP rather than diminishing it; and shifting capital costs to operating costs through battery-as-a-service or leasing models, which reduces the upfront financial burden for consumers without requiring direct government pay outs.

The objective here is not to explore the importance and effectiveness of regulatory and non-fiscal incentives that can help to build the market. This will of course be complement by the fiscal incentives as and when they are available.

The market needs to develop with a combination of regulatory support, operational cost advantages, and targeted infrastructure, rather than the heavy cash-transfer subsidies. This prioritizes long-term viability and infrastructure readiness.

While West Bengal's EV Policy 2021 includes various incentives, the market has pivoted by focusing on several enablers:

- **Operational cost savings over upfront subsidies:** The market is increasingly driven by the Total Cost of Ownership (TCO). In West Bengal, EV three-wheelers have become 'silent winners' in Tier-2 and Tier-3 cities because charging costs for a full range can be as low as Rs 20, compared to the high cost of petrol.
- **Infrastructure as the primary driver:** A multi-criteria study on West Bengal found that infrastructure advancement is the most crucial factor for EV adoption, even more so than direct subsidies.
- **Building code mandates:** By amending municipal and New Town building rules to mandate EV-ready connections in new constructions, the state is lowering future barriers to adoption without ongoing fiscal outlays.
- **Specialized power tariffs:** The state provides a dedicated, single-part electricity tariff for EV charging (approximately Rs 5.50–6.00 per kWh) and has waived fixed costs for EV connections, which significantly reduces long-term operational expenses for fleet operators.

Possibilities for subsidy-independent growth in West Bengal: West Bengal is better-positioned to scale its EV market through non-subsidy levers due to several regional strengths. Both the car and two-wheeler segments have shown a steady 1.4x growth rate over the last decade. This predictability allows the government to set incremental ZEV targets that align with existing market momentum rather than forcing a sudden, disruptive shift.

The compact city advantage: Compactness of cities like Kolkata restrains heavy vehicle usage. In compact urban environments, range anxiety is less of an issue because daily trip distances are shorter. This makes BEVs highly practical for the average consumer in West Bengal, increasing the likelihood that OEMs can actually meet mandate targets.

Managing modest motorization: Since the overall rate of motorization in West Bengal is modest, the state is not yet oversaturated with Internal Combustion Engine (ICE) vehicles. Implementing a mandate now is easier than trying to convert a fully saturated market later; it allows the state to leapfrog traditional motorization by ensuring that new growth is primarily electric.

Public transport dominance: Over 60 per cent of Kolkata's transport demand is met by public or semi-public modes. Transitioning this high-usage segment (buses, taxis, and three-wheelers) to electric creates a stable, high-utilization market that can remain profitable without permanent subsidies.

PPP infrastructure models: The State Nodal Agency (WBSEDCL) is targeting the development of 854 charging stations under a public–private partnership (PPP) model. This shifts the capital burden to private investors while the government provides land and power.

Grid readiness: Unlike some regions, West Bengal's grid operates with a surplus capacity margin, allowing it to absorb large-scale EV charging—particularly during off-peak hours—without requiring immediate, expensive upgrades. It will require upgrades at the last mile level.

Single-window clearance: The establishment of an EV Accelerator Cell and the integration of EV services into the 'Silpasathi' single-window portal reduces the bureaucratic cost of doing business, which is often more valuable to large-scale operators than small purchase rebates.

5.3. Exploring regulatory levers—setting targets and ZEV mandates

One of the most direct ways to build market demand is through official targets and mandates for ZEV adoption. By codifying long-term goals or interim adoption targets, governments provide clarity and urgency to industry and consumers. West Bengal has already declared high-level targets in its EV Policy 2021, aiming for highest EV penetration by 2030 and a million EVs on the road during the policy period. To spearhead this, the state can consider adopting a formal ZEV mandate or sales target for future years.

There is now a growing interest in developing a state-level Zero Emissions Mandate (ZEV mandate) that requires automakers to sell a minimum quota of ZEVs that can begin at a lower level and gradually upgraded annually to increase the level of ambition. This is a regulatory requirements for the manufacturers to produce and sell a certain share of their annual sales as ZEV.

There are several advantages of this strategy. It leads to more competition to sell that puts a downward pressure on the costs, increases product diversity and quality, increases consumer choice and gradually normalizes EVs and expands the market without government incentives. This incentivizes OEMs to access financial resources for technology innovation and product diversification, and provides flexibility to the industry to develop plans to achieve targets and provides certainty in the market to encourage investors.

A mandate is a revenue-neutral strategy for the government as this leverages market competition to promote ZEVs, and free up government capital for EV promotion and charging infrastructure. This incentivizes OEMs to access financial resources for technology innovation and product diversification, and further improves consumer confidence to drive the EV demand. On the other hand, a purchase requirement forces consumers to compete for a limited number of products. Purchase requirements put upward price pressure on a limited supply.

Globally such strategies are evolving creating opportunities for the Indian market as well. Such efforts are also complemented by the market driven purchase credits. Manufacturers can qualify for ZEV programme credits based on vehicle performance aligned with FAME eligibility related to electric vehicle range, energy density and power consumption for BEVs, and range etc. Non-compliance with criteria can attract lower credits that can neither be banked nor traded. Manufacturers with little or no electric vehicles in their inventory can buy surplus credits to avoid penalties and trade within same segment. Linking energy efficiency

and range with the ZEV mandate will ensure that low emissions and higher calibre vehicles will receive higher credits.

The Bureau of Energy Efficiency is working on a similar framework at the national level. A credit trading mechanism can provide an incentive to manufacturers to build EVs, win ZEV and emission credits, get a fresh revenue stream from banking and trading of over-compliance credits. BEE is exploring developing a carbon credit system as a compliance mechanism. Those who overachieve their target can trade their CO_2 credits with the laggards to help them meet the target.

The National Automotive Policy, 2018 has recommended banking and trading of CO_2 credits by vehicle manufacturers—CO_2 credits awarded to a manufacturer for exceeding compliance requirements should be valid for two to three years. This would offer flexibility to manufacturers and avoid penalties for non-compliance. CO_2 credits or debits per manufacturer will be available to facilitate trade of credits between manufacturers. Designing the credit programme will be critical for effective implementation.

Global experience shows that a combination of target, ZEV mandate and incentives can be game changers. California has adopted this combined approach; China has likewise implemented a New Energy Vehicle mandate since 2017, essentially a credit-based requirement for manufacturers to produce a certain share of electric vehicles.[27] These mandate the auto industry to offer ZEV options.

For West Bengal, a state-level mandate could focus on specific high-impact segments. For example, given the current registration trend makes three-wheelers the lowest hanging fruit, the government might stipulate that all new three-wheelers (L5) sold from 2026–27 onward must be electric. This will not only lock in ZEVs on the road but also potentially divert the segment's current transition to LPG and CNG.

Opportunities for ZEV sales mandate in West Bengal

The growing penetration of EVs in West Bengal—currently exceeding 4 per cent and trending toward higher target—is shifting the policy landscape from 'niche adoption' to 'market readiness'. As noted earlier, this momentum creates a strategic opening for a ZEV sales mandate, a supply-side regulation requiring manufacturers to ensure a specific percentage of their sales are zero-emission. Here is how current growth is paving the way for such a mandate:

The Original Equipment Manufacturers (OEMs) often resist mandates by citing a lack of consumer appetite. However, the consistent rise in EV registrations in West Bengal (driven by segments like e-rickshaws and increasingly E-2Ws and E-4Ws) shows that the infrastructure and consumer mind-set can be leveraged with strategic interventions to create the market push. A ZEV mandate shifts the responsibility of market development to the OEMs and achieves its 2030 electrification goals without relying solely on taxpayer-funded incentives. While the early adopters are on board, a ZEV mandate can expand the consumer base by diversifying the model lineup across different price points, addressing the 'lack of choice' that currently limits the mass market. High EV penetration can make infrastructure roll out profitable while providing long-term certainty for infrastructure investors, guaranteeing that there will be a steady stream of new EVs on the road to utilize the charging network. The state's EV Accelerator Cell can pivot from facilitating to enforcing.

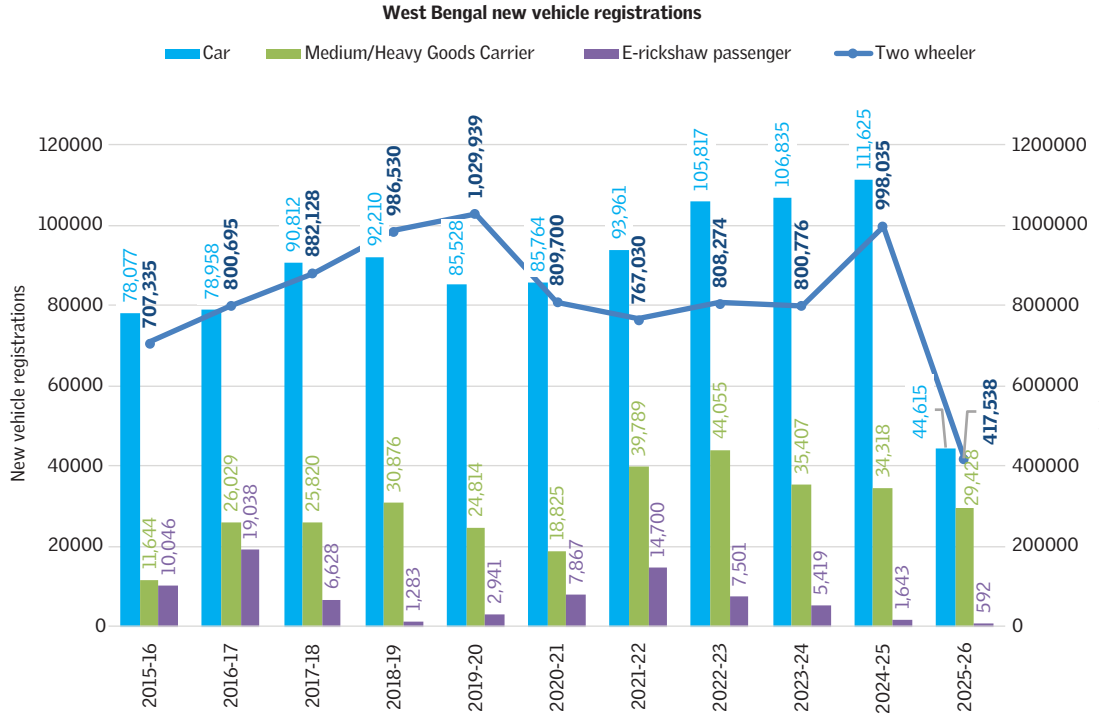
OEM-wise electric vehicle penetration is progressing

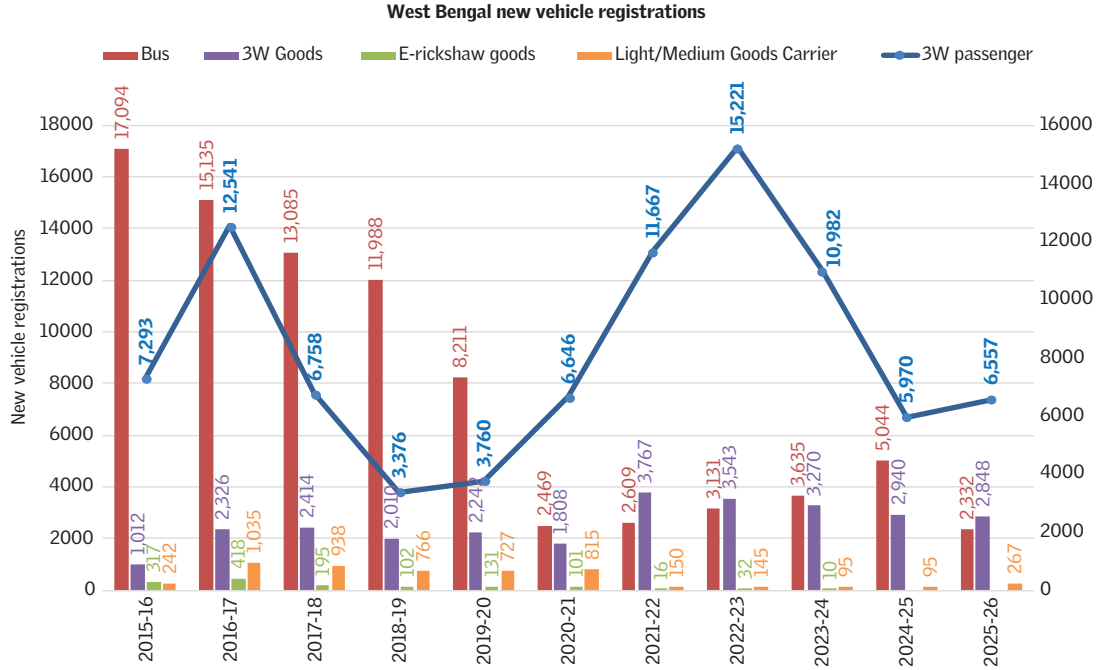
To determine if a sales mandate is realistic, the state must know the existing BEV penetration within each specific manufacturer's portfolio. It helps authorities understand EV growth within the context of the state's motorization trends, ensuring that regulations do not over-pressurize a market that already has naturally restrained ownership patterns. By monitoring which segments (e.g., two-wheelers vs. cars) are growing fastest, the state can tailor its ZEV mandates to manufacturers with the highest volume impact on the road.

Given West Bengal's economic development level, population income profiles, and compact urban layouts—which naturally restrain personal vehicle ownership—the overall rate of motorization remains modest. There is growth of the overall vehicle segments which serve as the baseline for EV penetration in the state. As of September 2025, two-wheelers is the largest segment, with cumulative registrations of 1236,296 since 2006–07. Annual registrations grew from 707,335 (2015–16) to 998,035 (2024–25), a 1.4-fold increase. Cars and cabs have shown cumulative registrations at 1,515,156. Annual registrations in this segment also saw a 1.4-fold increase, rising from 78,077 in 2015–16 to 111,625 in 2024–25. In other segments (cumulative), goods carriers have been registered at 587,178, passenger three-wheelers at 131,631 and buses at 170,359 (see *Graph 7: Motorization in West Bengal [new vehicle registrations]*).

Trend in EV penetration: Based on the available information it is evident that commercial vehicles and last-mile connectivity vehicle segments with high daily usage are leading the charge because the lower running and maintenance costs

Graph 7: Motorization in West Bengal (new vehicle registrations)





Note:
1. Cars include both motor cars and motor cabs;
2. Bus includes private and STU buses

Source: Vahan database (till September 2025)

of EVs eventually offset their higher initial purchase price. Goods three-wheelers have the highest penetration at 41.1 per cent. Passenger three-wheelers are showing a nearly identical trend with 40.8 per cent penetration. Cabs show a relatively higher penetration of 10.3 per cent compared to personal vehicles.

Interestingly, personal electric cars have reached a 5.7 per cent penetration rate. This is notable because it exceeds the national average and has occurred 'organically', without the benefit of direct fiscal incentives, suggesting a strong consumer preference and better model availability in the local market. This organic growth is to a great extent market driven, suggesting that consumers are choosing EVs based on their own value assessments rather than government subsidies.

Typical market drivers for EVs value lower running and maintenance costs compared to internal combustion engine (ICE) vehicles, which eventually offset the higher initial purchase price (see *Table 5: Vehicle segment-wise electrification in West Bengal [in per cent]*).

This situation raises a broader question: if the current fiscal regime remains unchanged or shifts focus away from financial incentives, what other regulatory levers can be utilized to drive market growth and investment? The West Bengal market has

Table 5: Vehicle segment-wise electrification in West Bengal (in per cent)

Vehicle category	2025–26 (till Sept 2025)	2024–25	2023–24	2022–23	2021–22	2017–18	2016–17	2015–16
Bus	0.3	0.4	1.0	2.4	0.3	0.1	0.0	0.0
Bus—institutional	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cab	10.3	9.1	8.9	8.8	1.0	0.0	0.0	0.0
Car	5.7	2.9	2.1	1.0	0.4	0.0	0.0	0.0
Medium/heavy goods carrier	0.9	0.6	0.8	0.0	0.0	0.0	0.0	0.0
Three-wheeler—goods	41.1	35.2	40.6	22.2	8.7	0.0	0.0	0.0
Three-wheeler—passenger	40.8	30.7	26.6	11.5	3.0	0.2	0.1	0.0
Two-wheeler (L2)	2.9	2.4	1.7	1.1	0.3	0.0	0.0	0.0
Two-wheeler—commercial	0.6	1.9	65.1	0.0	0.0	0.0	0.0	0.0
Two-wheeler—small	0.9	1.1	1.7	8.1	2.5	0.0	0.0	0.0
Total (including e-rickshaws)	5.8	4.45	2.8	1.4	0.7	0.5	0.2	0.1

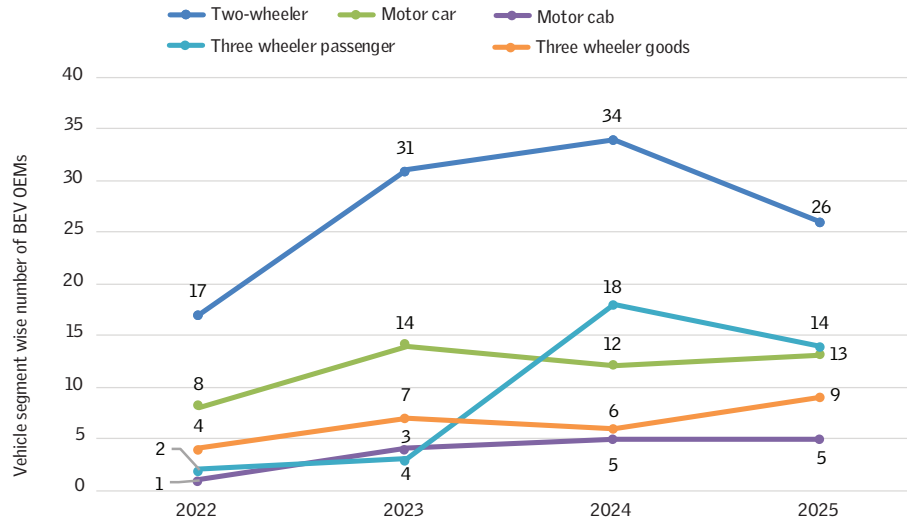
Source: VAHAN database (till September 2025)

already demonstrated adaptability to a reduced incentive structure, which currently comprises a combination of national demand incentives and temporary state-level tax measures. Furthermore, charging infrastructure in the state has begun to develop using fully priced strategies without significant concessions, resulting in rates that are already higher in West Bengal than in other regions.

To reduce reliance on incentives, it is necessary to work with regulatory levers to commit a commensurate demand to enable and support accelerated private investments at the consumer and industry levels.

Broadly defined, legal tools refer to governmental mandates, laws and regulations designed to require or accelerate a shift toward Zero Emission Vehicles (ZEVs). These tools can be paired with strategic pricing mechanisms and non-fiscal preferential measures to stimulate demand. By combining an enabling legal framework with smart market incentives, West Bengal can overcome existing barriers and establish a self-sustaining ecosystem for clean transportation. Currently, the state is witnessing a steady increase in the number of OEMs across various vehicle segments. As expected, the highest number of BEV models is available in the two-wheeler segment, followed by the three-wheeler passenger segment. However, the variety of BEV motor car models purchased or available in the state remains lower than the national average. In 2025, West Bengal recorded sales from 13 different BEV car OEMs, whereas approximately 21 different OEM BEV models were sold nationwide (see *Graph 8: Vehicle segment-wise and year-wise number of OEMs in West Bengal*).

Graph 8: Vehicle segment-wise and year-wise number of OEMs in West Bengal



Data source: Vahan database (September 2025)

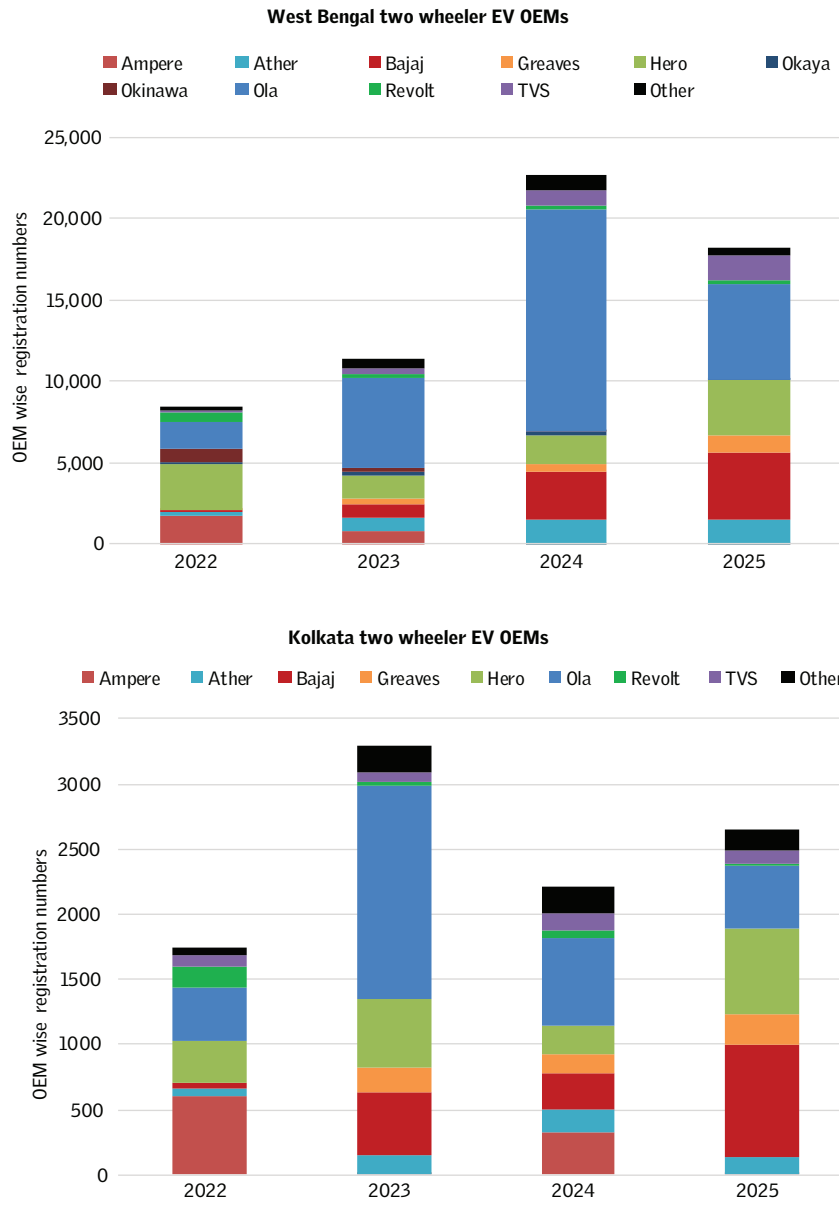
BEV-two-wheeler penetration in the state: Several significant hurdles currently impede the rapid growth of the BEV-2W segment in West Bengal. High-quality electric two-wheelers remain more expensive than their ICE counterparts, which acts as a primary deterrent for price-sensitive buyers. A critical factor is the lack of local fiscal support, such as the waiving of registration and other legal fees, which contributes to a higher total cost of ownership compared to states with more aggressive subsidy regimes. The market is heavily populated with low-cost two-wheelers priced as low as Rs 40,000, making it difficult for premium BEV-2W models to compete effectively on price alone. An interaction with key two-wheeler BEV dealers for Ola, Hero, Bajaj and others reveal that the widening price gap between BEVs and ICE vehicles remains a primary industry concern due to the lack of dedicated state support. This is further affected by the lack of state level incentives related to legal fee waiving etc. Good quality electric two-wheelers cost is still on slightly higher side compared to ICE ones.

The adoption trend is not uniform across the state, with a clear distinction between the capital and other regions. Overall BEV-2W sales have increased across the broader geography of West Bengal. Despite state-wide growth, there has been a 'noticeable dent' or a significant slowdown in adoption specifically within the Kolkata capital region. Consumer preferences vary by location; for instance, Bajaj and Hero enjoy higher popularity in Kolkata than they do in the rest of the state.

The market is characterized by a shifting landscape among the major manufacturers (Original Equipment Manufacturers). Ola Electric has maintained its position as the top-selling E-2W manufacturer in West Bengal since 2023. Bajaj Auto Ltd follows Ola as the second-most popular brand, showing particular strength in the Kolkata urban market. Hero MotoCorp is a significant player that, along with Bajaj, captures a larger share of consumer interest in the capital region than it does elsewhere in the state. In Kolkata Bajaj and Hero brands are more popular and since 2023 there have been more shifts in the market (see *Graph 9: Year-wise two-wheeler BEV OEMs in West Bengal and Kolkata [2023–25]*).

Overall, the national incentive programme has functioned as a primary driver of the electric two-wheeler market, showing high sensitivity to subsidy changes which directly impacts state markets like West Bengal. National sales trends have historically mirrored the fluctuations in the FAME-II (Faster Adoption and Manufacturing of Electric Vehicles) subsidy. When the national incentive was increased in 2021 from Rs 10,000/kWh to Rs 15,000/kWh (along with a higher incentive cap), sales surged by 274 per cent. In June 2023, the government reduced the incentive back to Rs 10,000/kWh and lowered the maximum subsidy cap from

Graph 9: Year-wise two-wheeler BEV OEMs in West Bengal and Kolkata (2023–25)



Data source: Vahan database (September 2025)

40 per cent to 15 per cent of the ex-factory price. This caused an immediate 56 per cent drop in national e-2W sales. A subsequent reduction to Rs 5,000/kWh caused national sales to halve again.

Despite these setbacks, the industry has shown resilience. By late 2023 and early 2024, national trends began to recover even with lower incentives as consumers

adjusted to the new pricing and manufacturers introduced more models. The year-on-year growth shows that the total BEV-2W registrations for FY 2023–24 (up to February 2024) reached 734,760 units, already surpassing the 7,28,271 units sold in the previous full financial year, despite the mid-year subsidy cuts.

The volatility of national policies has several implications for West Bengal market as well. While national sales saw sharp drops, BEV-2W sales in West Bengal have generally continued on an upward trajectory. There has been a noticeable slowdown specifically in the Kolkata capital region following these national incentive changes. The reduction in central support has widened the price gap between electric and ICE vehicles. This makes it harder for premium e-2W models to compete in a market already saturated with low-cost petrol two-wheelers priced around Rs 40,000 (see *Graph 9: Year-wise two-wheeler BEV OEMs in West Bengal and Kolkata (2023–25)*; *Graph 10: Two-wheeler OEM-wise BEV penetration in the total two-wheeler sales in West Bengal and Kolkata* and *Graph 11: Trend in OEM-wise BEV share in e-two-wheeler segment [2023–25]*).

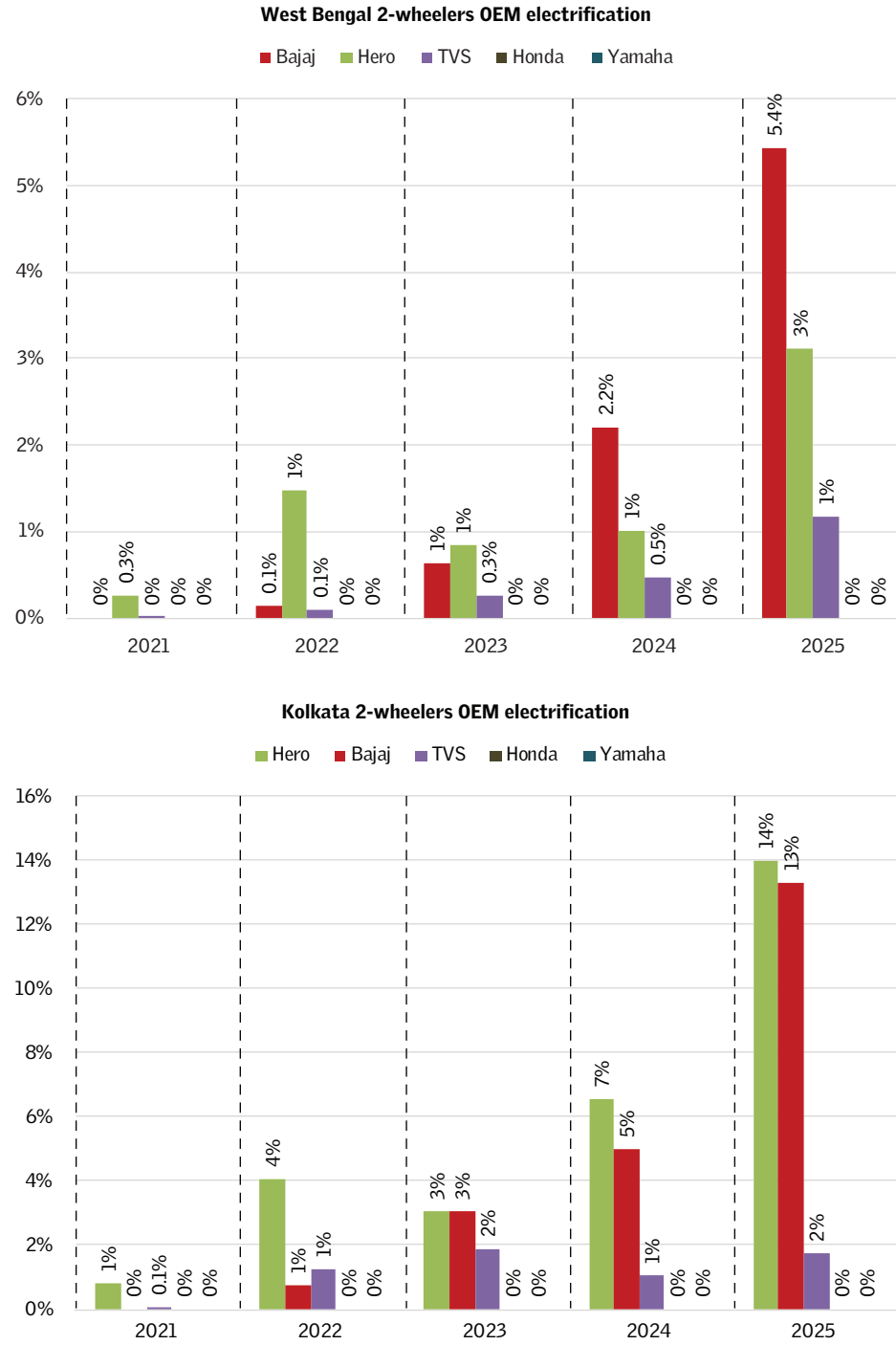
Electric cars

The positioning of car OEMs in West Bengal is defined by a distinct split between premium and budget offerings, with market dynamics shifting as of late 2024 and 2025. The car segment in West Bengal features a growing number of players, though the variety remains lower than the national average.

The competitive landscape for cars in West Bengal is currently dominated by legacy manufacturers who have successfully introduced electric models alongside their traditional portfolios. MG Motor has currently positioned as the market leader with the highest sales of electric cars in the state. Their lead was solidified in late 2024 through the introduction of the Battery as a Service (BaaS) model, which lowered upfront purchase costs and tilted consumer preference in their favour.

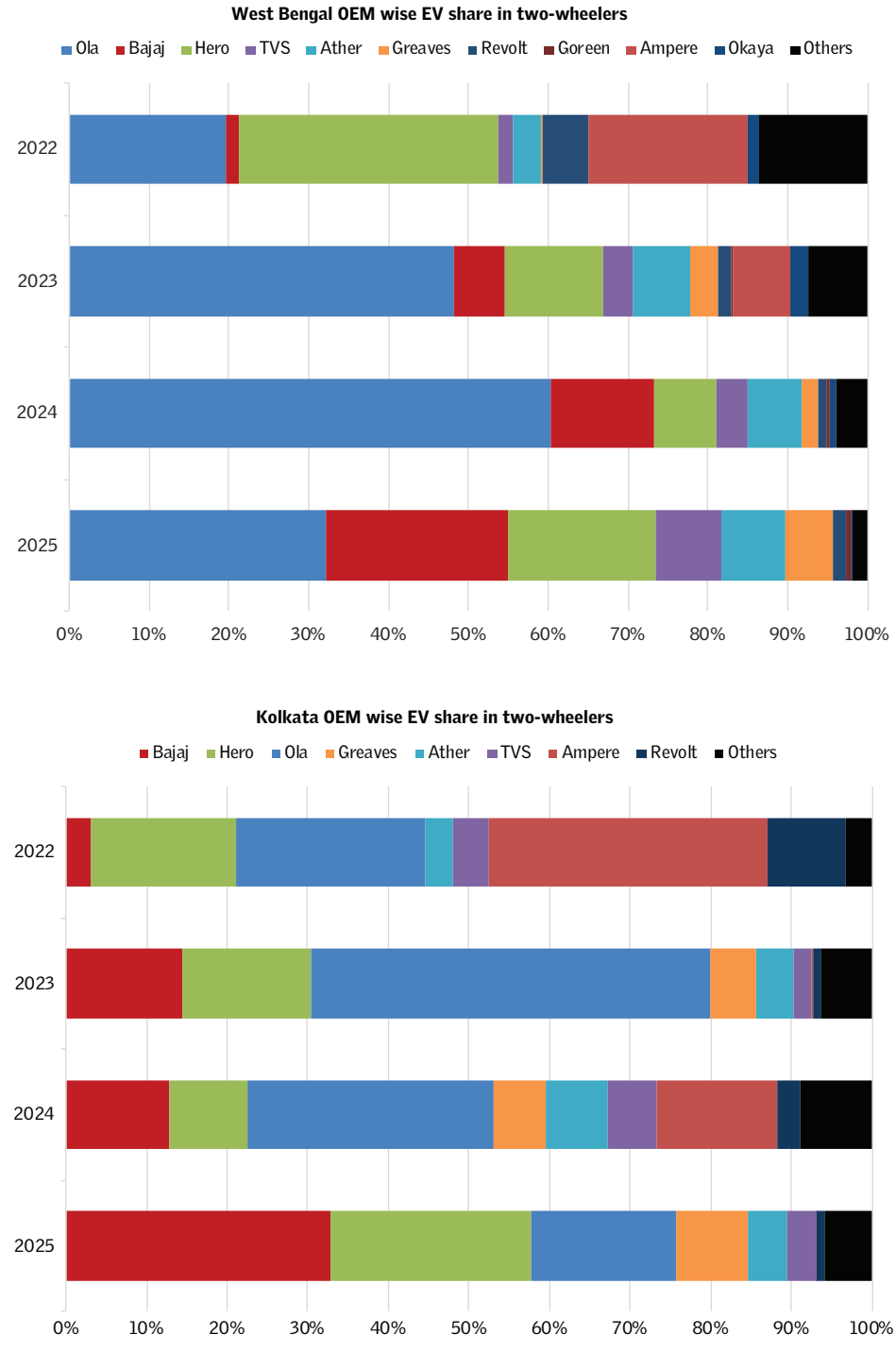
Tata Motors is a prominent player. Alongside MG, Tata has been one of the few OEMs to provide budget-friendly e-car models to the state over the past few years. While Mahindra & Mahindra has models like the BE 06 and BE 09 available in Kolkata, they are positioned strictly in the premium segment. Their budget-focused models, such as the 3XO, have yet to arrive in the state. BYD is recognized as another prominent player in the state's evolving electric car landscape. Despite Maruti Suzuki being the largest car maker in the ICE segment, Maruti has not yet started selling e-cars in West Bengal. They had not yet registered any BEV sales in West Bengal as of 2025.

Graph 10: Two-wheeler OEM-wise BEV penetration in the total two-wheeler sales in West Bengal and Kolkata



Source: Vahan database (till September 2025)

Graph 11: Trend in OEM-wise BEV share in e-two-wheeler segment (2023–25)



Source: Vahan database (till September 2025)

While West Bengal's overall motorization rate is naturally restrained by compact urban layouts and income profiles, the car segment shows notable progress. Personal cars in the state have achieved a 5.7 per cent penetration rate. This outpaces the national average despite the lack of direct fiscal incentives, indicating strong local preference or better-than-average model availability.

In 2025, West Bengal saw sales from 13 different BEV car OEMs, which is lower than the approximately 21 different OEM models sold nationwide. For comparison, fleet cabs have reached a higher penetration of 10.3 per cent due to their higher utilization rates.

Electrification levels vary significantly by manufacturer and geographic focus (state-wide vs. Kolkata), reflecting a market where adoption is often concentrated in the capital. In Kolkata, Tata Motors saw its BEV sales share increase from 9 per cent in 2022 to approximately 26 per cent in 2024. Overall, personal car penetration in the state has reached 5.7 per cent, surpassing the national average. This growth is notable because it has occurred without direct fiscal incentives, suggesting consumers are making value assessments based on lower running and maintenance costs.

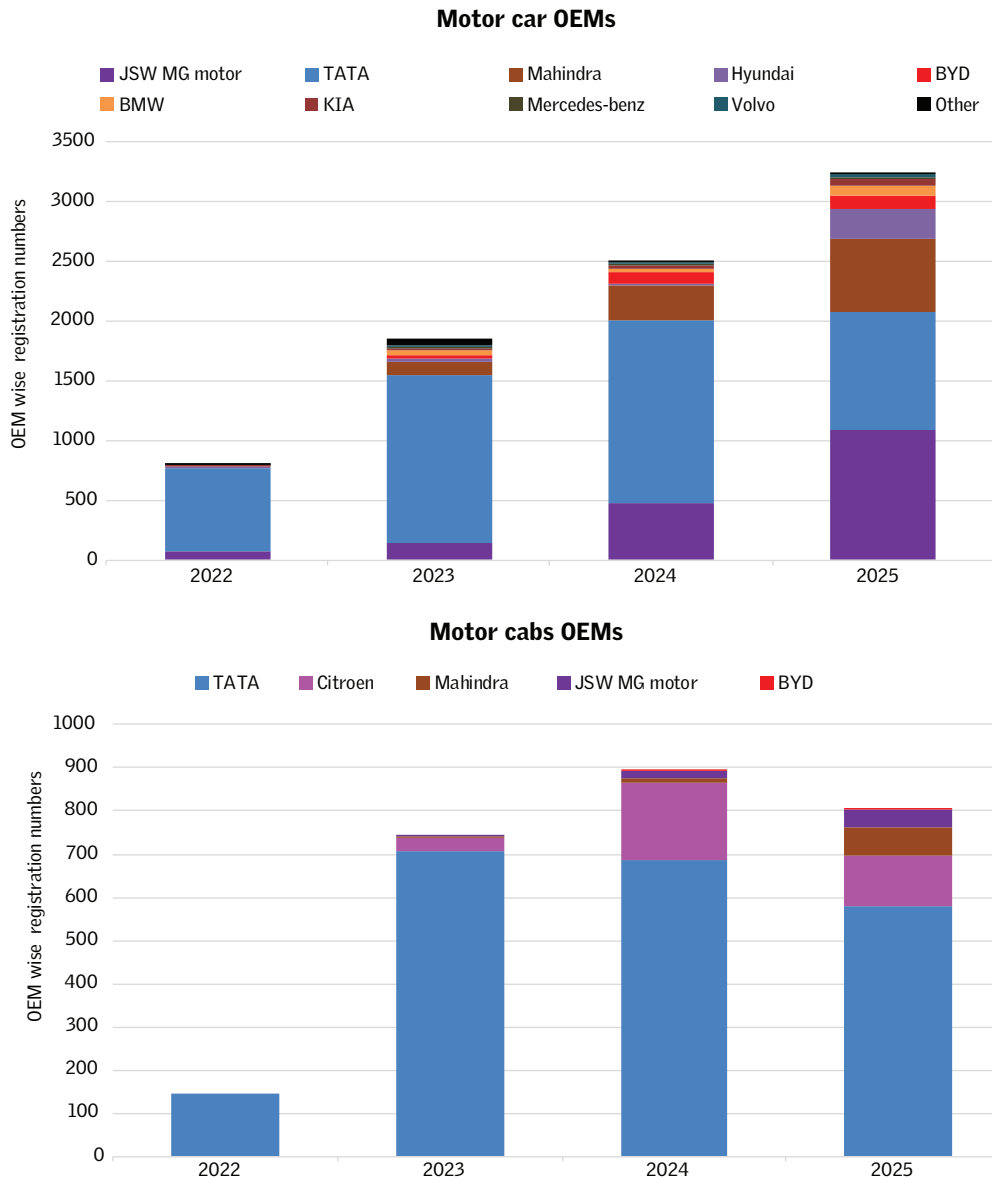
Despite growing consumer enthusiasm and inquiries at Kolkata dealerships, several hurdles remain. Almost all dealers highlight range anxiety as a primary concern for potential buyers. A significant lack of adequate charging infrastructure continues to act as a hurdle for the mass transition to e-cars. Issues related specifically to battery performance and longevity are frequently cited by consumers. There is a stated need for greater EV awareness among citizens to accelerate the transition from 'intent' to 'purchase'.

Despite the growth, West Bengal still lags in model diversity. In 2025, the state saw sales from 13 different BEV car OEMs, whereas approximately 21 different OEM models were sold nationwide.

If only the overall BEV sales numbers are considered, a comparative analyses of the private car BEV sales in West Bengal and Kolkata city shows that both in state and the capital city, MG, Tata, Mahindra and Hyundai registered the highest BEV sales respectively in 2025. While state-wide MG and Tata witnessed comparable share of BEV sales in 2025, in Kolkata MG sales were at least 44 per cent more than that of Tata.

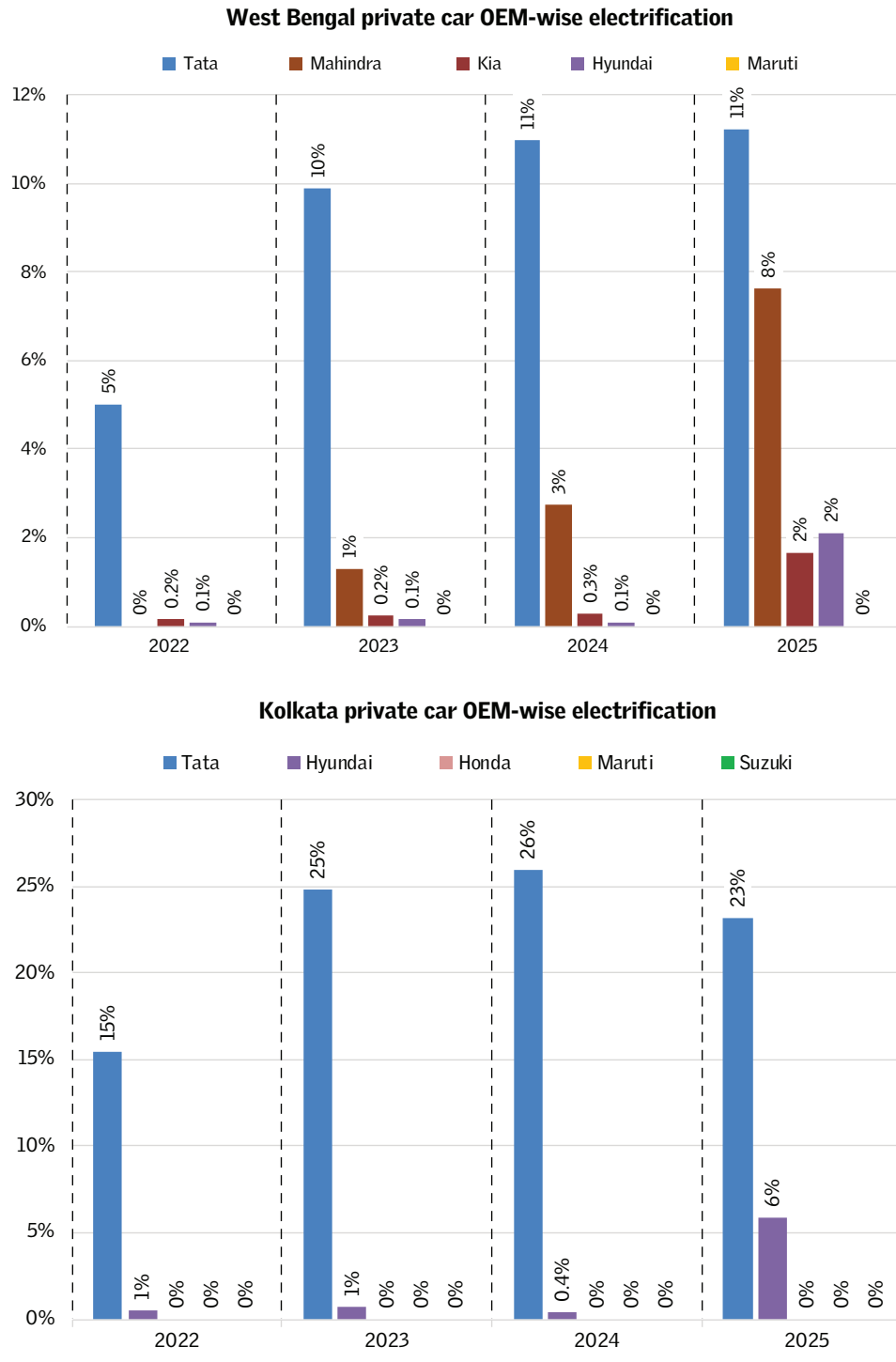
Both state-wide and in Kolkata, sales of MG BEVs increased from nine and 12 per cent of total BEV sales in 2022 respectively to 34 per cent and 40 per cent respectively in 2025. At the state level, the share of Tata's sale gradually decreased from 87 per cent of the total BEV sales in 2022 to 31 per cent in 2025. At the capital city level too, Tata's sales have decreased gradually (see *Graph 12: Year-wise BEV motor car and motor cab OEMs in West Bengal*; *Graph 13: OEM-wise BEV penetration in car segment* and *Graph 14: OEM-wise BEV share in car segment [BEV+ICE]*).

Graph 12: Year-wise BEV motor car and motor cab OEMs in West Bengal



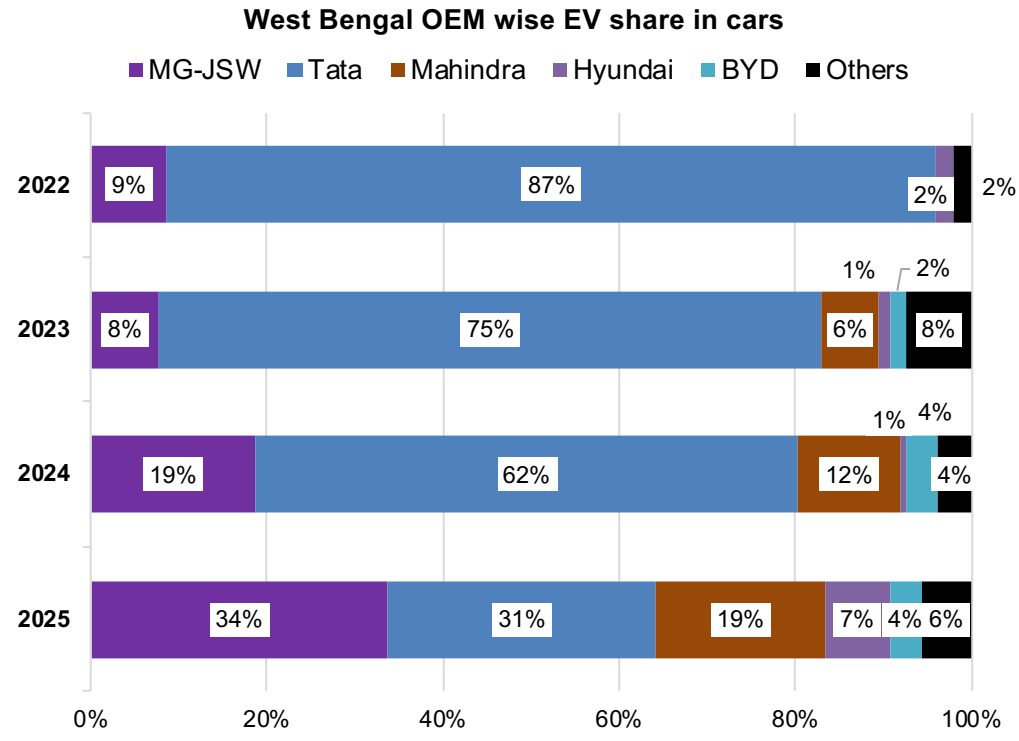
Data source: Vahan database (September 2025)

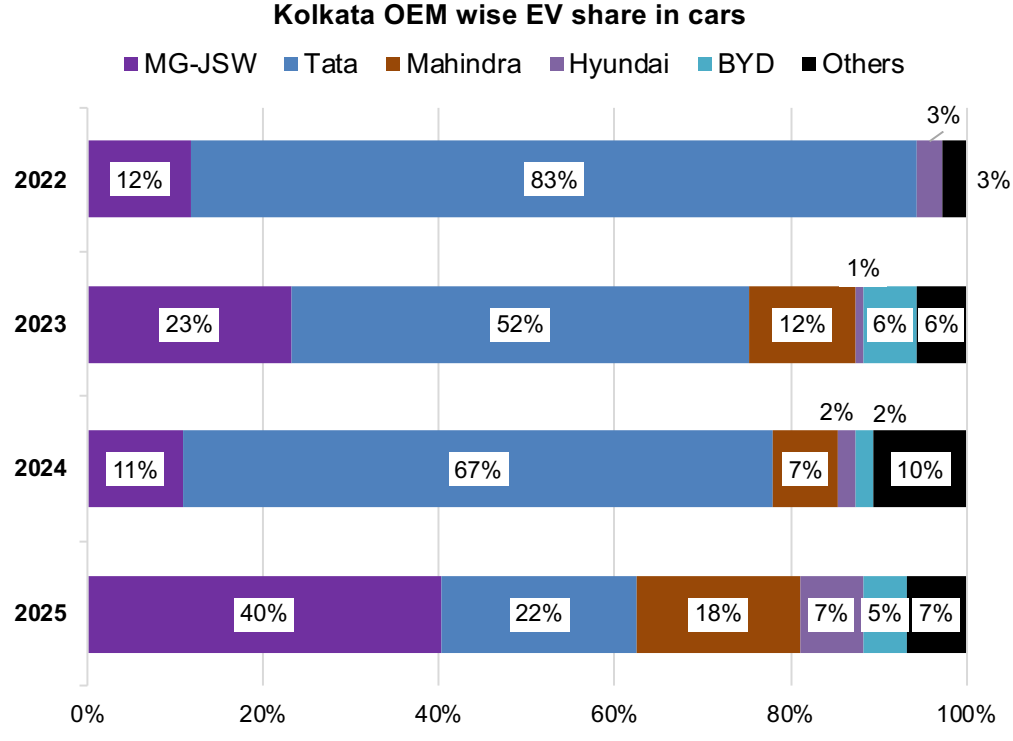
Graph 13: OEM-wise BEV penetration in car segment



Data source: Vahan database (September 2025)

Graph 14: OEM-wise BEV share in car segment (BEV+ICE)





Data source: Vahan database (September 2025)

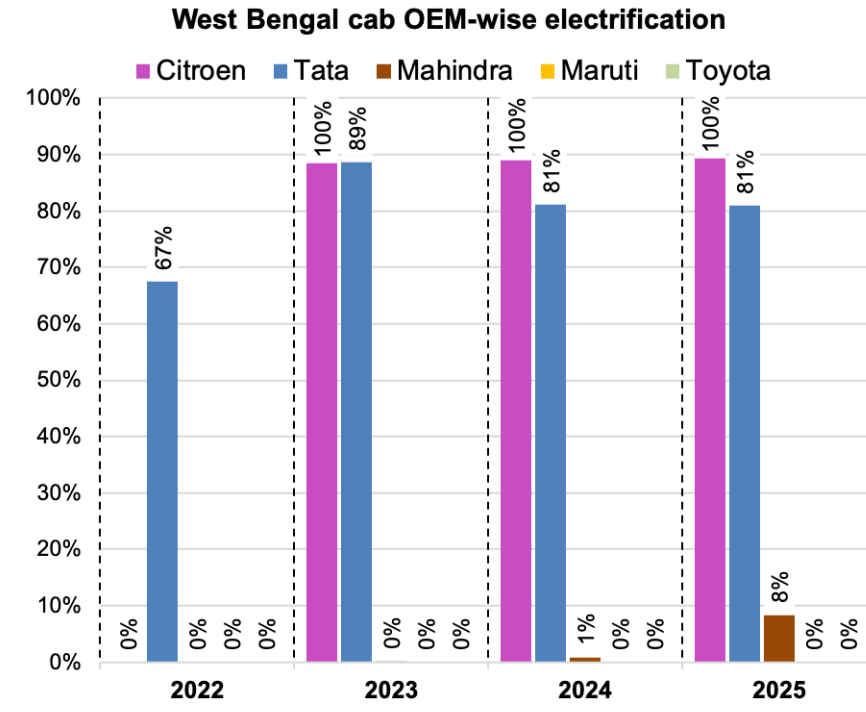
Electric motor cabs

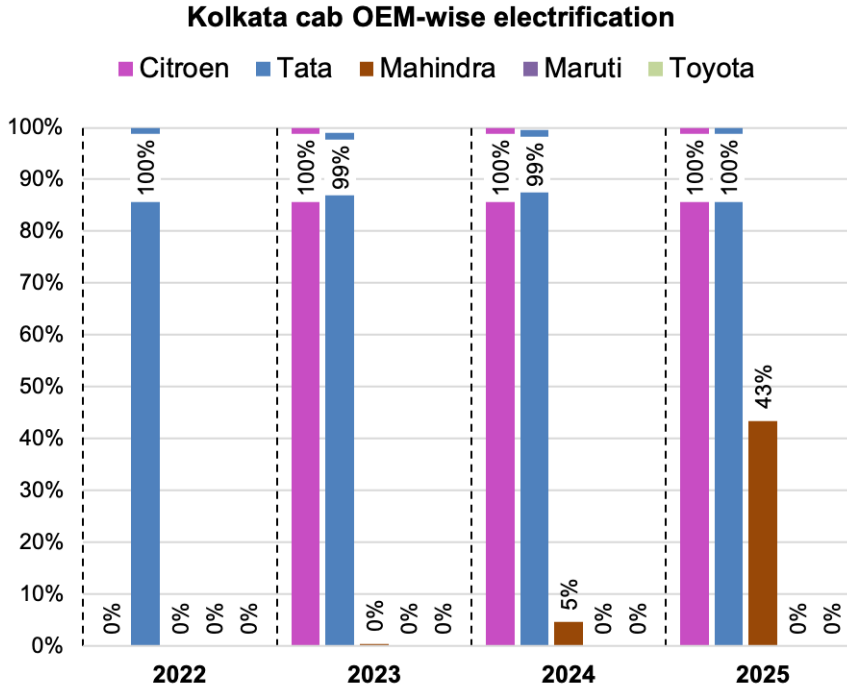
The electric cab segment is one of the fastest-growing areas of electric mobility in West Bengal, driven primarily by commercial utilization. Cabs in West Bengal show a relatively high penetration of 10.3 per cent, significantly outperforming the personal car segment. The market is dominated by two primary players: Tata Motors and Citroen. High utilization rates make electric cabs more economically attractive than personal EVs, as the lower running and maintenance costs more quickly offset the higher initial purchase price. High daily usage makes the lower running and maintenance costs of EVs highly attractive to fleet owners, as these savings eventually offset the higher initial purchase price. Tata Motors and Citroen are the leading Original Equipment Manufacturers (OEMs) in this segment. Other Notable OEMs like Mahindra is also among the top five selling cab OEMs in the state, while major traditional players like Maruti Suzuki and Toyota had not yet registered any BEV cab sales as of the report date. Citroen is noted as a 'pure BEV OEM' within the commercial segment, and Tata Motors has seen its BEV sales share in Kolkata grow from 9 per cent in 2022 to approximately 26 per cent in 2024.

The West Bengal market, particularly in Kolkata, is characterized by a marked interest by app-based aggregator services. Kolkata's largest passenger e-aggregator, Snap-E, has established formal partnerships with Tata Motors and Citroen to expand its 100 per cent fleet. Other services like Everest Fleet have also tied up with Tata Motors for e-ride-hailing services. These aggregators often develop their own charging hubs to maintain vehicle uptime; for instance, Snap-E operates an exclusive network of over 700 charging points in Kolkata to ensure its fleet of over 600 cars remains operational. In the capital region, Tata Motors has reached 23 per cent electrification, almost exclusively selling BEV models for cab services in the city.

The e-cab ecosystem in West Bengal, particularly in Kolkata, features several distinctive operational models. Kolkata's largest passenger e-aggregator, Snap-E, has established formal partnerships with both Tata Motors and Citroen for its e-cab services. Other major e-aggregator services are also scaling up; for example, Everest Fleet has tied up with Tata Motors to expand its e-ride hailing offerings in the state. Much of this growth is occurring 'organically' without the reliance on direct fiscal incentives, suggesting that the transition is being propelled by the inherent value assessments of fleet operators. To support these growing fleets, aggregator-led models often include the development of dedicated charging infrastructure, such as the hubs operated by Snap-E to maintain high vehicle uptime (see *Graph 15: OEM-wise Cab BEV penetration in West Bengal*).

Graph 15: OEM-wise cab BEV penetration in West Bengal

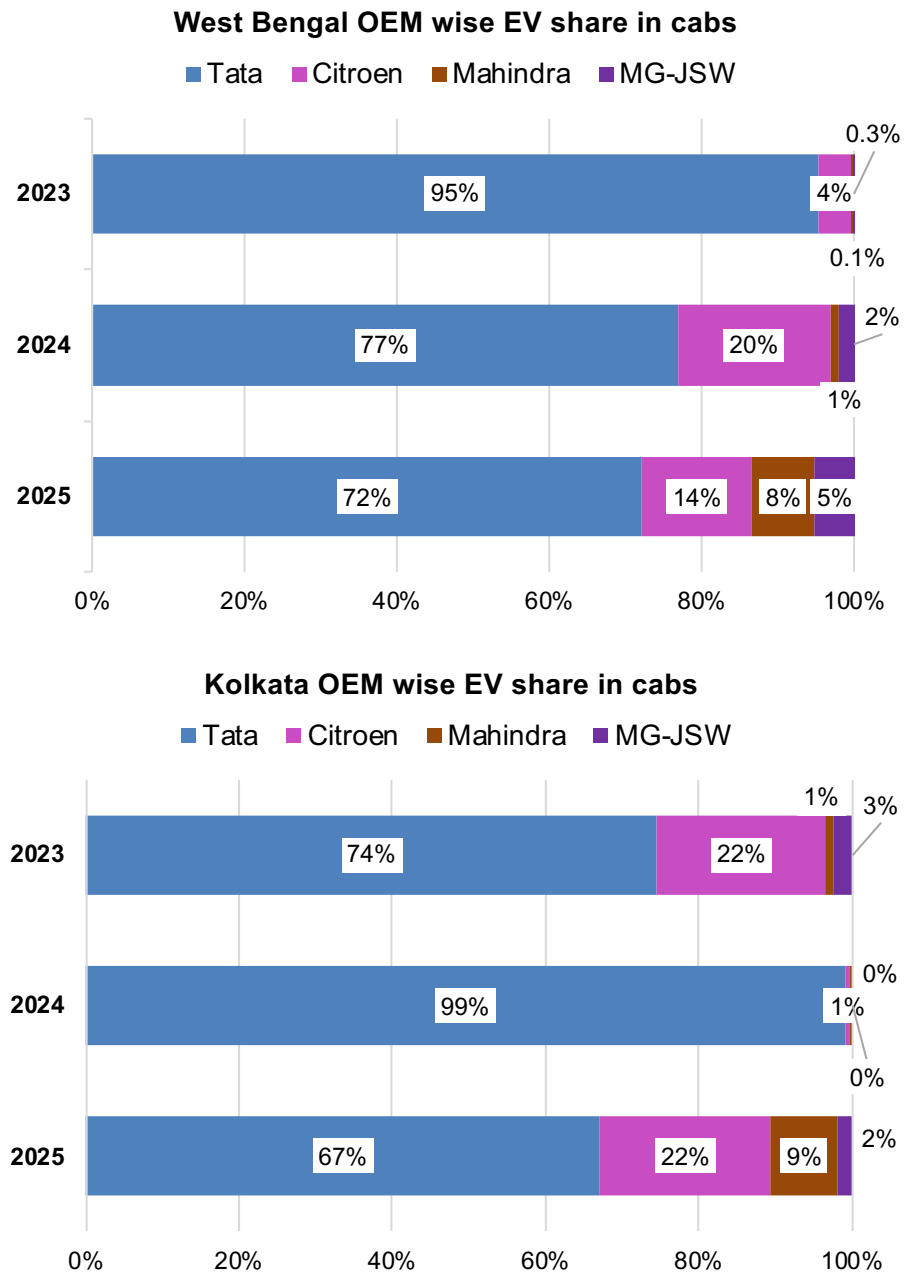




Source: Vahan database (till September 2025)

BEV sales-wise, Tata has consistently registered the most BEV cabs in both West Bengal and Kolkata since 2023 (see *Graph 16: West Bengal OEM wise EV share in cabs*).

Graph 16: West Bengal OEM-wise EV share in cabs



Source: Vahan database (till September 2025)

Electric three-wheelers

The e-3W segment is defined by strong market presence across both passenger and goods categories. Mahindra has captured a significant portion of the West Bengal market for both passenger and goods e-three-wheelers since 2022. Beyond Mahindra, other noteworthy manufacturers establishing their presence in the state include Bajaj, Euler and TVS. While many individual manufacturers currently have a penetration level below 1–2 per cent, those with higher individual penetration are being used to establish the first baseline targets for the state's proposed ZEV sales mandate. Registration numbers for three-wheelers are highest in regions where the existing public transportation network is the least developed, highlighting their role in essential transit.

The data reveals specific nuances that differentiate the e-auto transition in West Bengal from other vehicle segments. Compared to other vehicles, the three-wheeler segments show the highest overall adoption rates. Goods three-wheelers lead with 41.1 per cent penetration, followed closely by passenger three-wheelers at 40.8 per cent in 2025–26 (till September 2025). The best-performing segments for EV penetration are those involved in commercial and last-mile transport, as high utilization rates make the lower running costs of EVs more attractive.

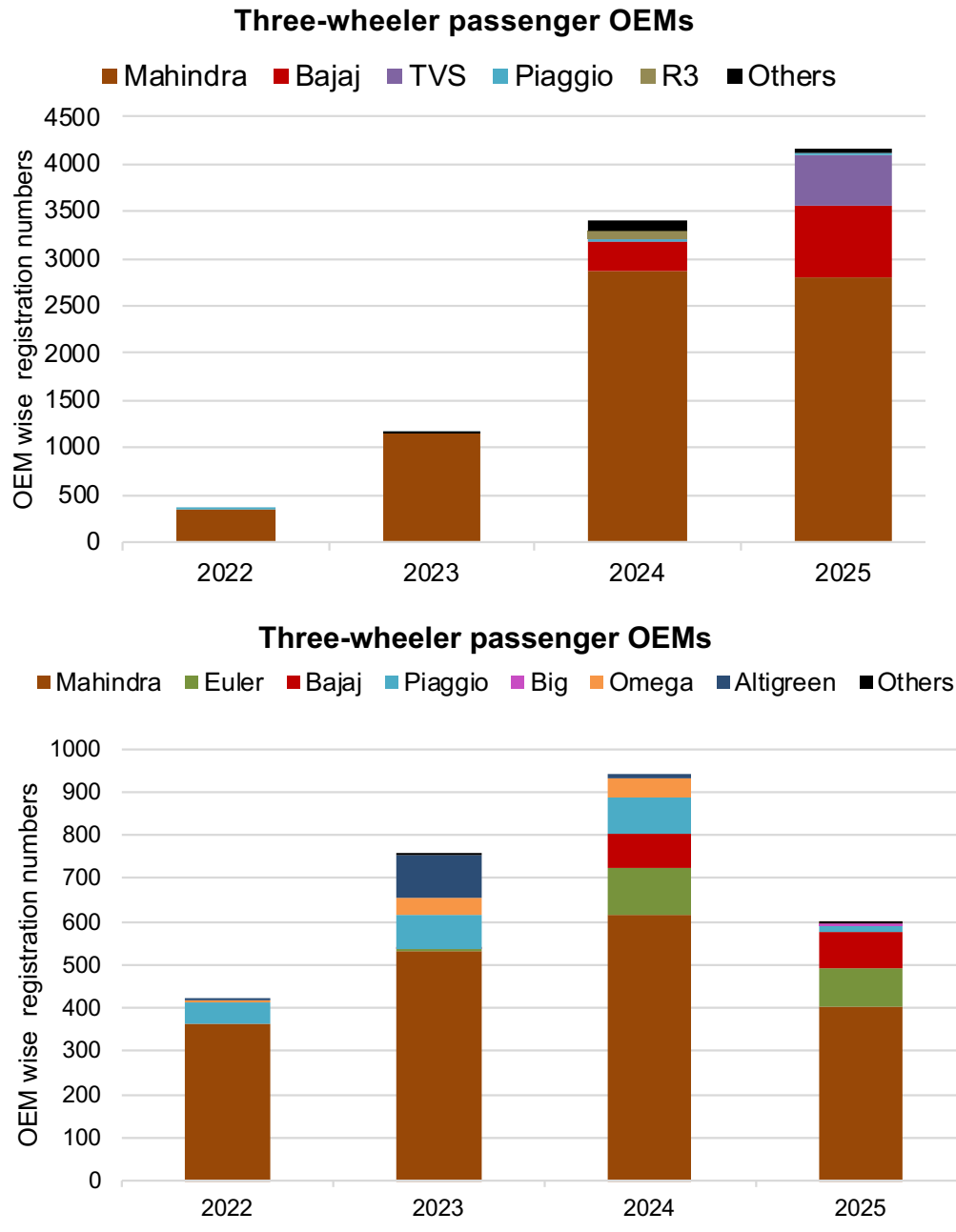
As of September 2025, there are a cumulative 131,631 passenger three-wheelers registered in the state. The segment is witnessing a steady increase in the number of OEMs. The three-wheeler passenger segment currently offers the second-highest variety of Battery Electric Vehicle (BEV) models in the state, surpassed only by the two-wheeler segment (see *Graph 17: Year-wise BEV 3W passenger and goods segment OEMs in West Bengal*).

This review shows that the EV industry has got its foothold in the state. While consumer interest is growing, strategic policy must still address primary barriers such as range anxiety, the lack of charging infrastructure, and the high upfront cost relative to cheap ICE alternatives.

5.4. Setting procurement targets

A procurement mandate shifts the focus from individual consumer choice to systemic fleet transition. Already, the West Bengal government has begun leveraging the procurement policies of vehicle fleet owners to create registration mandates that ensure a scalable change in the state's transport landscape. By setting firm deadlines for electrification, the state provides long-term certainty for the private sector, which in turn encourages the establishment of charging infrastructure and local supply chains.

Graph 17: Year-wise BEV 3W passenger and goods segment OEMs in West Bengal



Data source: Vahan database (September 2025)

The state strategy can prioritize segments with high daily utilization, where the environmental and economic benefits of EVs are most pronounced. A target for 100 per cent electric city buses by 2030 can be proposed for state transport undertakings (STUs). A complete transition of taxi fleets to BEVs is envisioned

by 2035. The government fleets can be targeted include the conversion of all 15-year-old government-owned or leased vehicles to electric models. Ride-hailing and delivery services companies operating bike taxis, delivery bikes (e.g., Zomato, Flipkart), and ride-sharing services are key targets for regulated electrification percentages.

Implementing these mandates can create several strategic advantages for West Bengal. Focusing on commercial and public vehicles—which have much higher road plying time than personal vehicles—maximizes the reduction of tailpipe emissions and noise pollution. Public fleets benefit from lower operational and maintenance costs, which eventually offset the higher initial purchase price of EVs. Volume purchases through mandates can lower vehicle purchase prices for public fleets by an estimated 15 per cent below MSRP. Mandates allow the state to maintain growth momentum even if direct fiscal incentives are reduced, as the responsibility for adoption is shared with fleet operators.

NASCENT BUY-IN FOR ZEV MANDATE

A 2023 Centre for Science and Environment (CSE) study has identified a critical missing piece in India's electrification strategy as the lack of supply-side mandates. While national and state policies have heavily utilized pull factors—such as purchase subsidies (FAME-II) and tax waivers—these have not achieved the scale needed for India to meet its 30@30 (30 per cent electrification by 2030) or global net-zero pledges.

The study reviewed global best practices (such as those in California, China and the EU) and concluded that a Zero Emission Vehicle (ZEV) mandate is essential to force industry competition, diversify model availability, and lower prices through economies of scale. To validate this, CSE organized a dialogue with the vehicle manufacturing industry, government bodies and experts to gauge the industry's readiness for such a transformation.

OEM responses to the ZEV Mandate and the consultation revealed a tacit support for the strategy, but responses varied significantly across vehicle segments. Two- and three-wheeler segment manufacturers were most supportive of a mandate. They acknowledged that price parity with internal combustion engine (ICE) vehicles is achievable quickly in these categories. The industry projected they could accept an upscaled target of 25 per cent to 50 per cent by 2030.

Car and bus OEMs took a more conditional view. They expressed concerns over high upfront costs, range anxiety, and inadequate public charging infrastructure. They argued that a mandate would only work if it were paired with extended financial incentives for consumers and industry.

There is a preference for phasing. Collectively, OEMs preferred a 'lower-bound' ZEV mandate that would be implemented progressively from 2025 to 2030 rather than an immediate, high-stringency requirement.

Despite hurdles, many OEMs were positive about growth prospects, particularly those with BEV-only portfolios who expected even higher growth due to lower total cost of ownership (TCO).

The findings from the CSE study provide a clear roadmap for a state-level mandate in West Bengal.

To enforce these mandates, West Bengal can utilize various regulatory and legal tools. For example, fleet operators may be required to report their fleet composition as a condition for renewing their license to operate. The state can issue Green Permits or other preferential access for electric commercial vehicles to achieve the effect of a mandate without purely fiscal pressure. ZEV sales mandates can be paired with pricing mechanisms to require manufacturers to meet a specific percentage of zero-emission vehicle sales.

While legal mandates and regulations set the stage, market-based strategies provide the economic pull for consumers and industries to embrace zero-emission vehicles. These tools work by leveraging financial incentives, price signals, and innovative business models to make EVs more affordable, accessible, and appealing relative to conventional vehicles. For West Bengal, which faces budgetary limitations, it is particularly important to design market interventions that maximize impact per rupee or even operate with minimal government spending by catalysing private investment.

It is possible to leverage existing momentum. Since West Bengal already has high penetration in three-wheelers (over 40 per cent) and growing success in the car segment (5.7 per cent organically), the state can set aggressive baseline targets for these high-performing segments first.

West Bengal can introduce a mandate with higher stringency for two-wheelers and three-wheelers while allowing a more gradual, incentive-backed ramp-up for private cars and buses. A state-level mandate can help West Bengal achieve its 10 per cent 2027 target without depleting its budget, as the mandate uses market competition rather than state subsidies to lower costs. This can be revenue neutral. The state can use its authority over vehicle registrations and permits to enforce these mandates, potentially requiring fleet aggregators (like Snap-E) to meet specific ZEV quotas as a condition for their operating licenses.

It is therefore necessary to do target setting for longer-term policy visibility to bring more certainty in investments: vehicle segment-wise, for charging, and production facilities. This needs to be implemented in a phased manner from 2025 to 2030. This ZEV mandate needs to be designed with all critical parameters including ZEV credit regulations and penalty system. State-level trading system can be crafted for which proper rules will have to be fleshed out for credit transfer. This requires industry participation to detail out strategy. Continue to reform and strengthen ZEV schemes with multiple measures including demand incentive, charging infrastructure, battery ecosystem etc.

6. Legal framework for shaping ZEV targets and mandates

Even though there is growing interest in evaluating the application of ZEV mandates and targets to drive sales, there are questions about the adequate legal backup for regulating and guiding sales to meet clean air and climate objectives. This makes it necessary to assess the available legal provisions under different legislations that can be leveraged to implement ZEV mandate. From this perspective, a review of the key environmental legislations as well as those related to motor vehicles has been reviewed for potential application.

In India the regulatory architecture for vehicles, fuels, and emissions is distributed across multiple statutes, each with its own scope and limitations. While the Motor Vehicles Act, 1988, and its subsidiary rules provide the backbone for licensing and construction standards, the real environmental authority stems from the Environment (Protection) Act, 1986, and the Air (Prevention and Control of Pollution) Act, 1977. Judicial interventions—especially from the Supreme Court and the National Green Tribunal (NGT)—have further expanded and clarified the use of these powers in the context of vehicular pollution.

6.1. The Motor Vehicles Act, 1988 and CMVR

The Motor Vehicles Act (MVA), 1988, along with the Central Motor Vehicles Rules (CMVR), constitutes the principal legislation governing road transport in India. The MVA lays down provisions for vehicle licensing, driver permits, vehicle registration, insurance, and safety requirements. The CMVR, framed under Section 110 of the Act, prescribes detailed standards relating to vehicle construction, emission norms, safety equipment, and testing protocols. These rules have been periodically updated to incorporate Bharat Stage (BS) emission standards, harmonized automotive test regulations, and design specifications for alternative fuel vehicles.

Under the Motor Vehicles Act, 1988, the power of the state governments to regulate the registration of vehicles is explicitly provided under Chapter IV section 65 sub-section (1), which authorises them to make rules for carrying into effect the provisions of Chapter IV on registration.[28]

This provision gives states a strong legal basis to frame rules that can influence which categories of vehicles are permitted to be registered. Since a vehicle cannot legally ply on public roads without registration, states can, through their rule-making power, impose restrictions or conditions that effectively determine the pace and nature of vehicle deployment.

By leveraging this authority, a state government can gradually limit or deny registration to new internal combustion engine (ICE) vehicles while enabling or prioritising battery electric vehicles (BEVs). Such a step would serve as a de facto phase-out of ICE vehicles, aligning with broader climate and air quality goals, while remaining legally anchored in the Act's framework for decentralised registration governance.

A legally backed direction that commercial vehicle permits henceforth be granted only to EVs in certain segments could rapidly tilt the market, as entrepreneurs would then choose EVs to receive permits. Indeed, the Government of India in October 2018 exempted all battery-operated transport vehicles from permit requirements altogether,[29] meaning states can allow electric autos and cabs to ply without the usual permit quotas. West Bengal can capitalize on this by actively encouraging electric three-wheelers and cab adoption. However, the MVA's focus is primarily regulatory and administrative, rather than environmental. It does not empower the Centre or the states to impose quotas or caps on vehicle registrations based on environmental grounds. Measures such as restricting new registrations, phasing out older vehicles, or mandating zero-emission quotas require reliance on environmental statutes rather than the MVA. This limitation has been highlighted in several policy debates where transport authorities lacked explicit legal backing to act purely on pollution considerations.

While the Motor Vehicles Act, 1988 governs registration procedures, it does not directly empower State Governments to impose environmental quotas on registrations. However, the Environment (Protection) Act, 1986 (EP Act) and the Air (Prevention and Control of Pollution) Act, 1981 (Air Act) provide an overarching statutory framework empowering the Central and State Governments to regulate and restrict activities, including vehicle use, to safeguard environmental quality. Thus, imposing quotas on new vehicle registrations, particularly for high-emission categories, is legally feasible under the environmental legislation framework and can be operationalised through directions to State Transport Departments.

Motor Vehicles Act, 1988: Section 41 (Registration of Motor Vehicles) provides procedures for registration but does not envisage environmental quotas. However,

as the registering authority, the Transport Department can be directed under EP Act, Section 5 or Air Act, Section 31A to limit or regulate registrations. Although the Motor Vehicles Act, 1988, does not independently empower quota-based restrictions on registrations, the Environment (Protection) Act, 1986, and the Air Act, 1981 provide a strong legal foundation. Courts and tribunals have repeatedly upheld environmental regulations restricting vehicle operations and registrations.

6.2. The Environment (Protection) Act (EPA), 1986

The EPA provides the Central government with sweeping powers to protect and improve the environment. The Section 3(1) authorizes the Central government to take 'all such measures as it deems necessary or expedient' for protecting and improving environmental quality. This umbrella provision empowers measures such as restricting new vehicle registrations.

Section 5 empowers the government to issue binding directions, including closure of industries, regulation of processes, or restriction on operations. This grants the Central government power to issue written directions to any person, officer, or authority. These directions are binding and may include closure, prohibition, or regulation of any industry, operation, or process. Regulation of electricity, water, or fuel supply. Restrictions on new activities contributing to pollution (including vehicle registrations).The Central government has delegated these powers to the state governments, CPCB and SPCBs, allowing them to issue enforceable orders.

These provisions have served as the legal basis for several executive orders regarding vehicular emissions, fuel quality and industrial siting. Using Section 23, the central government has delegated many of these powers to the State Pollution Control Boards (SPCBs) and state governments. This has enabled them to enforce vehicle restrictions, regulate fuel use, and take localized pollution-control measures in urban centres like Delhi, Bengaluru and Lucknow.

6.3. The Air (Prevention and Control of Pollution) Act, 1981

The Air Act of 1981 is another cornerstone statute, specifically designed to control and abate air pollution. It created the Central Pollution Control Board (CPCB) and SPCBs, giving them powers to monitor, regulate and enforce standards relating to air quality; Section 31A is particularly significant. It empowers pollution control boards to issue directions, including those relating to closure, prohibition, or regulation of industries or processes. Restriction of utility services, including fuel supply to vehicles. This provision has been invoked in practice to ban overage vehicles in Delhi and to deny them access to fuel.

Importantly, they are binding and enforceable without requiring prior court approval. This has been used in banning overage vehicles and fuel restrictions. Over the past two decades, SPCBs and the NGT have invoked Section 31A to ban vehicles older than 10–15 years, restrict the entry of diesel vehicles into sensitive zones and enforce seasonal bans on polluting fuels like furnace oil and petcoke. These interventions, although controversial, have often been deemed necessary in the face of severe public health risks. There is a mechanism for appeals against orders but does not empower authorities to impose quotas.

6.4. Judicial precedents and principles in promoting clean vehicles

Indian courts have played a transformative role in shaping the trajectory of vehicular regulation and environmental governance. Faced with rising air pollution, the judiciary has consistently prioritized environmental protection and public health over administrative convenience or short-term economic interests. Through landmark decisions, courts have reinforced constitutional mandates under Article 21 (Right to Life), expanding its scope to include the right to a clean and healthy environment.

- **Courts prioritizing environmental protection over administrative convenience.** Time and again, the Supreme Court and High Courts have rejected arguments that stricter emission norms or vehicle phase-outs would cause administrative burdens or economic disruption. Instead, the courts have held that public health considerations outweigh commercial inconvenience, placing the onus on both governments and industries to adapt. For example, in several vehicle-ban cases, the Court emphasized that inconvenience to manufacturers or dealers cannot justify exposing millions of citizens to toxic air. This jurisprudence has pushed regulatory bodies to act more decisively, even in the absence of explicit statutory timelines.

- **The doctrine of sustainable development and precautionary principle** Indian environmental jurisprudence is grounded in two key doctrines: the doctrines of sustainable development and precautionary principle. The doctrine of sustainable development, which requires balancing developmental needs with ecological protection. Applied in the mobility context, it means that while motorization may support economic growth, it must not undermine public health or long-term environmental security.

The precautionary principle, which holds that lack of full scientific certainty, cannot be used as a reason to delay measures to prevent environmental harm.

Courts have frequently applied this principle to justify proactive restrictions on polluting vehicles and fuels, even when complete scientific consensus on their exact contribution to air pollution was unavailable.

Together, these doctrines empower courts to err on the side of caution in environmental matters, ensuring that irreversible damage is not caused under the guise of economic or administrative efficiency.

6.5. Case laws and judicial precedence

Judicial precedence: There is a judicial reference to this act to take restrictive action. In M.C. Mehta v. Union of India (2002) 4 SCC 356, the Supreme Court upheld the authority of the Union and State Governments under the EP Act to regulate fuel quality and vehicle standards in Delhi, including orders for phasing out diesel buses (Case law: *M.C. Mehta v. Union of India* (2002): In this landmark case, the Supreme Court directed the complete phase-out of diesel buses in Delhi and mandated their replacement with compressed natural gas (CNG). The Court relied heavily on the EPA, recognizing that Section 3(1) powers allowed for systemic interventions in the transport sector. This case set a precedent for using environmental law, rather than transport law, to enforce mobility transitions for public health reasons.

Court on its own motion v. Union of India (Delhi HC, 2018): In this important case, the Delhi High Court upheld the April 2017 cut-off for BS-IV vehicle registrations as mandated by the Supreme Court, despite petitions from dealers seeking extensions to clear unsold inventories. The Court reiterated that manufacturers and dealers had sufficient notice of the transition timeline and could not claim hardship. The judgment reinforced the principle that environmental deadlines are non-negotiable, and commercial stockpiles cannot override clean-air imperatives. This precedent has had a deterrent effect on attempts to dilute or delay subsequent emission standard transitions, such as the leap to BS-VI in 2020.

In the Case law: Vardhaman Kaushik v. Union of India (NGT, 2015) the NGT used powers under the Air Act and Environment (Protection) Act to ban diesel vehicles older than 10 years and petrol vehicles older than 15 years in Delhi-NCR to curb vehicular pollution in Delhi. The Tribunal cited the Air Act, particularly Section 31A, to justify these measures. The judgment marked one of the most aggressive applications of environmental law in the mobility sector, reinforcing the regulatory bodies' authority to intervene in vehicle use when air quality deteriorates directly.

COMPARATIVE AND INTERNATIONAL EXPERIENCE

Singapore: Uses a Certificate of Entitlement (COE) quota system to cap new vehicle registrations, with strong air quality and congestion benefits.

Beijing, China: Implements lottery and auction-based registration quotas to control vehicular growth and emissions.

Delhi-NCR: While not a quota, restrictions on overage vehicles and odd-even traffic rationing demonstrate regulatory feasibility under Indian law.

Chandigarh: The Administration implemented a quota system for registration based on a policy framed for electric vehicles, although the policy has since been amended. The quota system was withdrawn due to the city's minuscule geographical area. As the new vehicle was registered in neighbouring cities and used in the city, the policy was unsuccessful in controlling vehicular density, and even financial losses occurred to the government exchequer.

The Delhi vehicle aggregator policy is another example where a direction was issued under Section 31(A).

Judicial reference shows that in Court on its Own Motion v. Union of India (Delhi HC, 2018), the High Court upheld restrictions on registering BS-IV vehicles after the cut-off date, pursuant to Environment (Protection) Act -based directions.

The Supreme Court in M.C. Mehta cases (1998–2002) directed conversion of Delhi's public transport fleet to CNG, relying on Environment (Protection) Act powers. NGT Orders (2014–16) imposed bans on overage diesel and petrol vehicles in Delhi-NCR. Delhi Government (2016 onward) denied fuel supply to overage vehicles under Section 31A of the Air Act.

The Supreme Court directed nationwide switch to BS-VI fuels and standards, overruling objections based on Motor Vehicles Act provisions, citing overriding powers of the Environment (Protection) Act. These precedents establish that environmental imperatives can override sectoral statutes, such as the Motor Vehicles Act, when conflicts arise.

Operational Pathway requires problem identification. The state government, citing air quality data (e.g., CPCB reports, NAAQS violations), different source apportionment reports and carrying capacity report, identifies vehicular emissions as a critical concern.

The state government can direct the Transport Department/Registration Authority to fix quotas for new vehicle registrations, prioritise low-emission categories (e.g., EVs, CNG) and restrict or suspend high-emission registrations in non-attainment areas.

This framework demonstrates that while the MVA provides the regulatory foundation, it is the EP Act and the Air Act—supplemented by judicial activism—that have created the real tools for environmental control in the transportation sector.

A state government can therefore legitimately impose vehicle registration quotas for emission control by issuing directions under the EP Act or Air Act, and implementing them through the Transport Department. Judicial precedents and international practices provide further credibility to such an approach.

7. Operational pathways: Enabling adoption of ZEV mandate and targets

To operationalize a zero-emission vehicle (ZEV) mandate at the state level, West Bengal can adopt a structured, data-driven approach that integrates regulatory approach with clear fiscal incentives and robust legal defences to drive ambitious target. West Bengal can implement a phased ZEV mandate and target setting strategy through several key pathways and enablers.

7.1. Legal pathways

There are regulatory levers for state intervention. The state can leverage several existing legal frameworks to enforce ZEV adoption. These include Motor Vehicles Act, 1988, Sections 115 and 65, which can restrict ICE vehicles in specific areas; refuse registration for high-emission vehicles. Air Act, 1981 Sections 19 and 20 that can declare 'Air Pollution Control Areas' and restrict emissions from specific vehicle sources. Environment (Protection) Act, 1986, Sections 3 and 5, which can issue binding government orders to mandate only EVs in sensitive zones. Also Municipal Acts (e.g., KMC Act, 1980) Section 28 and 29 to manage public streets and enforce movement restrictions in urban cores. Using legal authority under the Air Act and EPA to fix registration quotas for high-emission vehicles in pollution-sensitive zones while prioritizing BS-VI and electric vehicles (EVs).

It is possible to issue state-specific directives or notifications under the EP Act or Air Act for controlling vehicle registrations or mandating low-emission technologies. Ensure that legal instruments clearly specify the objectives, scope, and enforcement mechanism. Coordinate with urban local bodies, transport authorities and pollution control boards to effectively operationalize these directives.

Strong legal support and defensibility of state-level interventions are necessary to reduce litigation risk and ensure policy continuity. This approach integrates scientific assessment, statutory authority, targeted regulatory intervention, technological promotion (EVs and low-emission vehicles) and legal preparedness. This ensures a balanced strategy that is both environmentally effective and legally robust.

Any restriction (like quotas) must be evidence-based, using air quality data, science of toxic exposures, source assessment, public health defence etc. to withstand judicial scrutiny. It is necessary to defend measures legally. State interventions on vehicle registration and emissions are likely to face legal scrutiny; therefore, preparing a robust legal defence is crucial. This will require precedent and Case Law.

Courts in India have upheld environmental protection measures under the doctrine of sustainable development and the precautionary principle. Notable example include Court on its Own Motion v. Union of India (Delhi HC, 2018), which endorsed cut-offs for BS-IV vehicle registrations to protect public health. This requires documentation and justification to – show proportionality between restrictions (quotas/caps) and environmental objectives, ensure consistent policy messaging across transport departments, pollution control boards, and legal advisors to prevent administrative challenges, demonstrate that measures prioritize citizen health and urban sustainability over mere administrative convenience, reinforcing legal legitimacy.

Setting targets for electrification: Assessing the potential for Transport Departments to implement registration caps is a critical step in emission control. Backed by legislation, departments can cap new registrations in high-pollution areas, focusing restrictions on high-emission models while fast-tracking electric vehicles. With robust legal backing, these departments can implement strategic measures to curb vehicular emissions. Specifically, they may consider imposing vehicle registration caps within pollution-sensitive zones to limit high-emission vehicles, while simultaneously prioritizing the registration of electric vehicles (EVs).

Such mandates and target-setting frameworks need not be punitive; rather, they should be integrated into a collaborative industry roadmap. For instance, Section 8, Sub-section (1) of West Bengal's EV Policy outlines the creation of an EV Accelerator Cell designed to coordinate policy efforts and develop a comprehensive Internal Combustion Engine (ICE) vehicle phase-out plan across various segments.[30] By bringing together different departments and stakeholders, the state can chart out a phased timeline and then back it with the necessary regulatory and incentive measures. The act of setting such targets in official notifications or legislation creates accountability and momentum and even if initial targets are missed, they often spur greater effort and policy refinement.

Legal mandates and targets provide a vital top-down impetus for the Zero-Emission Vehicle (ZEV) transition. They signal an inevitable shift in the market,

prompting automakers, fleet operators, and consumers to begin planning for an electric future. When paired with supportive policies, mandates act as a powerful lever—as demonstrated in regions like California and China—to ensure ZEV adoption goals are achieved. West Bengal can solidify its vision as an e-mobility frontrunner by establishing clear targets for 2030 and beyond, thereby aligning the state with the global trajectory of 100 per cent zero-emission vehicle sales by 2040.[31]

Precedents of regulating introduction of zero emissions vehicles in other states: Other regions are successfully using legal frameworks to phase out high-emission vehicles. For instance, under Section 12 of the Commission for Air Quality Management Act 2021, the Air Commission directed Haryana, Uttar Pradesh, and Rajasthan to restrict new auto registrations in the NCR to CNG or electric models starting January 1, 2023. The plan mandates a full phase-out of diesel autos by December 31, 2024, in major districts like Gurugram and Ghaziabad, extending to Sonipat and Rohtak by the end of 2025, and concluding across the rest of the region by January 1, 2027. [32]

Similar strategies are being applied to bus fleets. While mandates for personal vehicles (cars and two-wheelers) remain more challenging, current regulations have successfully targeted commercial and public transport through fleet renewal policies. In Delhi, for example, the EV Cell now requires all future three-wheeler registrations to be electric, and the draft aggregator policy sets a target of 100 per cent electrification by 2026. These precedents can be used to define state-level zero-emission mandates supported by firm milestones and dedicated funding strategies.

Similar decisions have been taken in other cities like Kolkata, Mumbai etc. with respect to buses. Cities like Delhi where electrification of vehicles has progressed more are beginning to take decisions to set electrification targets for e-buses, three-wheelers, and fleet aggregators. According to the Delhi EV Cell, all future three wheeler registration needs to be electric. Delhi draft aggregator policy has also given a target of 100 per cent electrification by 2026. This can be taken forward to define state level zero emissions mandate with roadmap and firm milestones, and a dedicated funding strategy. State governments can also develop market based instruments and fiscal policies to accelerate zero emission transition.

It also needs to adopt market-based instruments. Exploring a ZEV Credit Programme (similar to Maharashtra's) where manufacturers earn credits for ZEV sales, which can be traded or used for compliance. It is encouraging to see

that Maharashtra has included Maharashtra ZEV Credit Programme in their EV policy—it plans to further explore the feasibility of a ZEV requirement and credit programme for the state. Technical details are yet to be worked out. Currently, most of the state EV policies in states have been issued by different departments as executive orders.

Chandigarh had attempted a vehicle registration quota system in the past, but the experiment revealed significant pitfalls. Registration caps were imposed to limit the number of new vehicles. But vehicles were registered in surrounding districts to bypass limits. There were enforcement gaps due to lack of robust digital tracking systems that led to non-compliance. Moreover, there was huge public pushback and citizens resisted restrictions due to perceived inconvenience.

Quota policies must be supported by integrated enforcement across jurisdictions, including digital systems for tracking registration, vehicle scrappage and inter-state compliance are essential. Benefits of quota policies include - long-term reduction in traffic; limited impact on overall air quality due to pollution from industry, construction and regional transport etc.

Restriction on registration or operation of vehicles beyond a certain age, particularly diesel vehicles, needs to be mandated. Enforcement challenges persist due to the movement of vehicles across state lines.

Vehicle segment-wise target for fleet electrification: These include sector-specific targets. It is possible to promote electric vehicles for app-based taxi and delivery services. Offer incentives for EV adoption and infrastructure by integrating private mobility with emission reduction goals. A combination of temporary measures (odd-even) and structural reforms (EV promotion, overage bans) is more effective than single interventions. Strong legal and enforcement mechanisms, along with effective incentives, are crucial for ensuring compliance and achieving long-term success.

The integration of measures—quotas, incentives, emission zones, and EV promotion—yields the most sustainable impact. Indian states must carefully design legal frameworks, integrate digital monitoring, and adopt context-sensitive approaches to avoid pitfalls experienced elsewhere. Global strategies related to quota-based systems (Singapore, Beijing) are effective in limiting vehicle numbers but require robust enforcement and transparency. Financial disincentives (congestion and emissions pricing in London) can drive behaviour change without

restricting ownership. Local experiments in Chandigarh, Delhi NCR show that enforcement gaps and inter-jurisdictional leakage undermine effectiveness. Directing all future three-wheeler registrations to be electric and mandating a percentage of app-based taxi and delivery fleets to be electric by a specific deadline. Establishing an EV Accelerator Cell (as proposed in West Bengal's EV Policy) to coordinate inter-departmental efforts, fast-track decisions, and develop an Internal Combustion Engine (ICE) phase-out plan.

Public procurement and fleet electrification mandates: Governments can lead by example by electrifying their own vehicle fleets and leveraging public procurement to stimulate the market. This is a legal-policy tool because it often requires official orders or legislation to prioritize ZEVs in procurement processes. West Bengal, like other states, has a significant number of vehicles under government departments, public sector units, and municipal bodies, as well as a large public transport fleet. Transitioning these to electric can both reduce government fuel bills and demonstrate viability to private users.

The state government can issue an order that all departments and offices must replace their official vehicles with electric vehicles at the end of the current vehicle lifecycle or lease term. There has been some progress on this front nationally– the Central government's Energy Efficiency Services Limited (EESL) initiated a programme to procure thousands of EVs for use by government agencies. West Bengal could participate in such programmes or do its own aggregated procurement for state departments.

Public transport electrification is arguably even more impactful. West Bengal's most visible opportunity is the electrification of Kolkata's extensive bus network (as well as buses in other cities and intercity buses owned by state transport undertakings). The state has already begun introducing electric buses Kolkata being among the first cities in India to pilot e-buses.

In West Bengal, beyond city buses, electric ferries and boats could be considered for Kolkata's famous ferry system, and electric utility vehicles for municipal services (garbage trucks, etc.) can be mandated as technology permits. Each of these would require coordination and possibly upfront investment, but legal direction focusing on life-cycle cost can justify it. The state might create a dedicated EV procurement fund to support public agencies in the higher initial cost of EVs, with the understanding that operating cost is lower. The West Bengal EV Policy mentioned setting up a state EV Fund to channel various resources for supporting EV adoption, which could be tapped for such purposes.

7.2. Supportive measures for policy mandates

Tax measures: Beyond broad targets, there are numerous regulatory measures a state can enact to sway the playing field in favour of electric vehicles. These include waiving or reducing certain fees for EVs, imposing stricter standards on ICE vehicles, and creating zones where polluting vehicles are restricted. West Bengal has already begun using some of these tools, and there is scope to expand them further.

A key regulatory incentive is the reduction or elimination of local taxes and fees on EVs. Since the upfront cost of EVs is higher than comparable ICE vehicles, many governments waive registration charges, road taxes, and other fees to narrow this gap. Acting on advisories from the Central Government, almost all Indian states have introduced such concessions. The Ministry of Road Transport and Highways (MoRTH) explicitly advised states to minimize or waive road tax on EVs in 2019, to help reduce purchase cost.[33]

In line with this, West Bengal's government announced full exemption of motor vehicle (road) tax and additional registration fees for battery-operated two-wheelers and four-wheelers during the policy period. This was initially notified for EVs purchased between April 2022 and March 2024, effectively making EVs free from state road tax for two years. [34] The policy was later extended; the state cabinet in 2024 approved continuing the 100 per cent exemption of registration fees and road tax for new electric two-wheelers and four-wheelers for an additional year till March 2025.[35] *(Note: While these notification exempted BEV two-wheelers and four-wheelers only, all categories of CNG vehicles were exempted from the MV tax and registration fees).*

Such waivers are a legal step the state can take under the Motor Vehicles Taxation rules, and they directly make EV ownership more financially attractive. Additionally, MoRTH in August 2021 issued a notification exempting battery operated vehicles from paying fees for issue or renewal of registration certificates.[36] West Bengal, by implementing this, ensures that an electric car or bike owner saves on registration charges as well. These regulatory incentives send a message that the government is actively favouring clean vehicles.

Introduce higher registration fees or surcharges for older or high-emission vehicles to discourage their addition to the fleet. Provide incentives for low-emission vehicles through reduced registration costs or faster processing. Also allocate registration slots based on urban pollution levels and fleet composition, revisiting periodically as air quality improves. This requires monitoring and enforcement.

Integrate quota mechanisms with digital registration platforms to prevent over-registration or non-compliance. Conduct periodic audits to ensure quotas are adhered to.

Parallel to restricting high-emission vehicles, states should actively promote cleaner alternatives and prioritise BEVs and low-emission vehicles. This will require incentives for BEV adoption including subsidies, tax rebates, and preferential registration. Facilitating charging Infrastructure and public-private partnerships for EV deployment. Designate urban areas where only low-emission vehicles (EVs, CNG, BS VI compliant) are permitted. Encourage fleet electrification for public transport and commercial services. West Bengal is focusing on fiscal incentives like exemption of motor vehicle (road) tax and registration fees for new electric two-wheelers and four-wheelers until March 2025. Infrastructure support that aims develop 854 charging stations under a Public-Private Partnership (PPP) model, with WBSEDCL serving as the State Nodal Agency. Exempting battery-operated commercial vehicles from transport permits and allowing 16–18-year-olds to obtain licenses for e-scooters.

Low-emission zones (LEZs) or zero-emission zones can be declared in congested city centres or environmentally sensitive areas. In such zones, entry of older or high-emitting vehicles can be prohibited or subject to a congestion charge, whereas EVs may enter freely. There are several legal levers that can fulcrum the implementation of LEZ/ZEZ in Greater Kolkata Area. Table 6 enlists some of the legal provisions the state can leverage for the implementation of this regulatory tool.

There are small instances of movement restrictions on personal vehicles in targeted areas where pedestrianization zones are being promoted in Delhi. For instance, in the case of pedestrianization of project of Shahjahanabad, in Chandni Chowk, the Transport Department, Government of NCT of Delhi, has issued a notification (dated June 14, 2021) under the Section 115 read with Clause (41) of Section 2 of the MV Act, 1988 to prohibit plying of motor vehicles on main Chandni Chowk road in the interest of public safety and convenience of general public of Delhi. The scope of this action needs to be expanded to develop low-emissions zones incentivising EVs, public transport and accessibility.

West Bengal could pilot a low-emission zone in areas of Kolkata, given its air quality concerns. For instance, certain parts of central Kolkata or eco-sensitive zones (around heritage sites or business districts), or business areas like Salt Lake's Sector 5 could be declared as requiring ZEVs (BEV) or Low Emission Vehicles (CNG), especially for commercial and public transport vehicles.

Over time, these zones could tighten to only allow ZEVs. The state's EV policy even floated the idea of Zero-Emission Vehicle (ZEV) Zones and Clean Street test-beds as pilot projects to showcase sustainable mobility.[37] Implementing such zones legally, via city municipal regulations or state notifications, can create micro-markets for EVs and demonstrate their benefits (quieter streets, cleaner air) to the public (see *Table 6: Legal levers to implement LEZ in West Bengal*).

Table 6: Legal levers to implement LEZ in West Bengal

Law/framework	Relevant sections	How it enables LEZs/ ULEZs/ZEZs	Caveats
Motor Vehicles Act, 1988 (MVA)	Sec. 115: Restrict use of vehicles in specific areas/ routes. Sec. 65: State power to make rules for registration. Sec. 116: Notify traffic signs, restrictions like 'No Entry for ICE Vehicles.' Sec. 110: Vehicle standards enforcement.	The State of West Bengal (through its transport department) can notify restrictions on ICE vehicles in defined zones; refuse registration of high-emission vehicles; place traffic signage to forbid entry.	State rules must not conflict with central rules. Enforcement requires cooperation of RTOs, police. Restrictions must be reasonable, non-arbitrary, and legally tenable if challenged.
Air (Prevention and Control of Pollution) Act, 1981	Sec. 19: Declare Air Pollution Control Areas. Sec. 20: SPCBs can restrict emissions from specific sources.	States/SPCBs can designate polluted cores as control areas and restrict high-emission vehicles from entry.	Powers must be exercised in consultation with SPCB. Enforcement requires coordination between SPCB, Transport Department and police. Not vehicle-specific unless tied to emission control orders.
Environment (Protection) Act, 1986	Sec. 3: Broad powers to protect/improve environment. Sec. 5: Authority to issue binding directions (incl. banning vehicles in zones).	Allows binding government orders for restricting ICE vehicles or mandating only EVs in sensitive areas.	Directions typically flow from Central government; delegation to State needed. Risk of judicial scrutiny if directions are arbitrary or disproportionate.
West Bengal Motor Vehicle (State) Rules	E.g. in West Bengal Motor Vehicles Rules, powers under Sections 66, 74, 79 of MVA to impose conditions on permits etc. (as specified in WB rules)	State scheme can attach conditions on permits (goods carriage, contract carriage) requiring low emissions in certain zones or denying them in specific precincts.	Conditions must be consistent with enabling provisions in MVA; cannot impose blanket bans without rule change; may face legal challenge if inconsistent or disproportionate.

Law/framework	Relevant sections	How it enables LEZs/ ULEZs/ZEZs	Caveats
Municipal / ULB Acts (e.g., Kolkata Municipal Corporation Act, 1980)	Section 28: general powers of Corporation India Code Section 29: obligatory functions including public streets, removal of obstructions etc. West Bengal Judicial Academy Section 113: power of the state government to call for records etc. West Bengal Judicial Academy Section 114: Power of state to regularly inspect and require actions by municipal authorities. India Code Section 115: Power of state government to require municipal authorities take action. West Bengal Judicial Academy Section 116: Enforcement by state for orders under Sec. 115. West Bengal Judicial Academy Section 415 (in Chapter XXII 'Town Planning / Buildings'): relates to building control tribunal etc.	KMC can adopt municipal bylaws, regulate or remove obstructions on streets, manage public streets and public places, maintain roads and bridges, enforce municipal orders aligned with LEZ/ZEZ restrictions. State government can direct KMC to enforce zone orders. KMC can use its 'general powers' for regulation of public streets and remove obstructions etc.	KMC's powers are constrained to its jurisdiction and cannot override central or state law. When state directs action, the municipal body must comply but may resist capacity issues. Bylaws must not conflict with higher law. Also, KMC does not have independent power over vehicle registration—it must work with RTO/transport.
West Bengal Municipal Act, 1993 (for other municipal areas/ as enabling for wider municipal powers)	Section 65: 'transport system including regulation of traffic terminus' is a municipal function under the Act. Entry or inspection powers: Section 387 (entry, inspection)	For municipal areas beyond KMC (if a zone is in a municipal area outside KMC), this act grants municipalities traffic regulation authority, allowing restrictions of vehicle movement or use in streets or terminuses. It also allows inspection to enforce municipal rules.	These municipal powers are subordinate to state and central law. Where municipality lacks capacity or overlapping jurisdiction with transport authority, enforcement may be weak. Also, KMC Act is a special act for Kolkata; municipal act is more general but may not have granular authority over emissions.

Law/framework	Relevant sections	How it enables LEZs/ ULEZs/ZEZs	Caveats
West Bengal Traffic Regulation Act, 1965	Section 5 and 6: power to regulate traffic in streets or public places.	The State can declare traffic regulations (e.g. 'No ICE vehicles in X zone') under this Act, enforceable by police/ traffic department in public streets.	Must ensure regulations are consistent with MVA. There may be challenges on reasonableness or encroachment into vehicle registration domain. Also, this Act is traffic control, not registration control.
KMC Building Rules/KMC Building Bylaws	E.g. in KMC Building Rules (based on KMC and building permit rules) —permit conditions referencing Sections 393 / 394 / 396(3) of KMC Act 1980 for building sanction.	In issuing building permits, KMC can impose conditions limiting vehicular ingress (e.g. restricting heavy polluting vehicle access) in certain precincts or ensure that roads within development zones comply with low-emission vehicle access norms.	Indirect lever—building rules don't directly control vehicle registration or traffic on public roads. Only applicable to new developments or redevelopment. Needs coordinating with traffic/ transport rules.

Source: Compiled by CSE

Connect fleet renewal with fleet electrification

West Bengal could explore enforcing age limits for petrol and diesel transport vehicles in urban areas, which would naturally push owners toward replacement with cleaner vehicles with preference and incentives given to electric vehicles. As stated earlier, the Central government has already taken steps in this regard– apart from permit and fee exemptions, battery-operated commercial vehicles have been freed from requiring transport permits, and youth aged 16-18 have been allowed to obtain licenses to drive e-scooters (up to 50cc equivalent) to broaden the user base.[38, 39]

Simplify registration

West Bengal can also simplify and digitize the registration process for EVs. For example, because EVs have fewer variants, a faster type-approval and registration certificate issuance could be possible. Any such ease-of-doing-business measures for EV buyers or manufacturers can be notified through government orders.

Supportive laws for energy management

On the energy side, supportive laws could include allowing open access for charging, as mentioned earlier, and encouraging renewable energy use. If an entrepreneur wants to set up a solar plant to exclusively power EV chargers in West Bengal, regulations should accommodate that through the state renewable energy policy. This ties into broader energy laws but is relevant for making EV charging green and potentially cheaper.

Liability and safety laws around EVs might also need attention. For example, updating fire safety codes to account for parking of EVs (due to battery fire risks, which are low but present), training first responders on EV fire incidents, and having guidelines for workshops that handle high-voltage systems—these legalistic details ensure safe integration of the new technology. The state can collaborate with bodies like Automotive Research Association of India (ARAI) for guidelines on this.

Enforcement of standards

Standards and rules can be put in place for the quality and safety of EVs and charging. While vehicle safety standards are national, the state can enforce standards for charging station safety, trained electricians for charger installations, and proper disposal of batteries. West Bengal can collaborate with agencies like the Bureau of Indian Standards (BIS) to adopt any standard codes for charging connectors, etc., ensuring interoperability.

Strengthen the institutional framework

West Bengal will need to enact supportive legal frameworks and create institutions that facilitate the EV transition. This includes everything from setting up nodal agencies, enabling new business models (like battery swapping and recycling), and ensuring a just transition for the workforce. A notable initiative from the EV Policy is the formation of an EV Accelerator Cell at the state level. Legally establishing this cell (via a government order or notification) is important so that it has the authority and resources to act. The cell is intended to bring together various departments—Transport, Power, Urban Development, Industry, etc. to enable faster decision-making and implementation of EV initiatives. By formalizing this as a permanent committee or mission, West Bengal can ensure sustained high-level attention on the EV agenda. The cell can also include industry representatives and academia (as an EV Forum) to advise on technology and market trends. Many states have similar interdepartmental committees; Maharashtra, for example, set up a State EV Council chaired by the Chief Secretary to oversee its EV Policy execution. Embedding such coordination in the governance structure is an indirect legal tool that improves policy coherence.

EV manufacturing and workforce development: There is an opportunity to develop the BEV industry in West Bengal, driven by the state's strategic goal to become a manufacturing hub for EVs and battery storage. With an ambitious target of reaching 10 lakh (1 million) EVs on the road by 2025, the state is actively positioning itself as an e-mobility frontrunner. The government plans include

the establishment of an 'EV Innovation Centre' and a 'Battery Industrialization Hub' to fast-track the development of safe, cost-effective and recyclable batteries. Infrastructure support can catalyse this change.

Such an industrial policy can enable job creation requiring workforce. As EVs proliferate, traditional ICE vehicle mechanics and others will need retraining. The legal tool here could be incorporating EV training into the curricula of industrial training institutes (ITIs) and mandating certain certifications for EV technicians. West Bengal could establish, via an education department order, that all polytechnics and ITIs add basic EV maintenance and battery tech modules. Also, if driver licensing needs tweaks (for example, training for driving electric buses which have different controls), the state should update those procedures.

On the labour side, if West Bengal's aggressive EV push leads to reduced work for those in engine repair, the state might want to support small workshops to pivot to EV maintenance through skilling programs. The policy hints at supporting R&D and skilling in next-generation technologies, turning that into action (like funding polytechnic courses, offering scholarships for EV research, etc.) will require administrative decisions and budget allocations anchored in policy.

The success of legal interventions for EV promotion often lies in effective governance and the enabling ecosystem. West Bengal should therefore legally institute coordinating bodies (like the EV cell), adopt supportive national standards (for batteries, swapping, etc.), and update its laws and educational programmes to align with the electric mobility paradigm. These measures ensure that the transition is well-managed, safe, and inclusive, thereby maintaining public confidence.

8. Legal enablers for charging infrastructure and power grid enablement

West Bengal must leverage its regulatory powers in urban planning, electricity distribution and land allocation to ensure that charging infrastructure grows rapidly and in a coordinated manner.

Enabling home charging: One important intervention is incorporating EV charging provisions into building codes and development regulations. Recognizing this, India's Central Ministry of Housing and Urban Affairs (MoHUA) in 2016 issued model building bye-laws for integrating EV charging infrastructure in new constructions.[40] These guidelines recommend that new residential and commercial buildings allocate a certain percentage of parking spaces as EV charging enabled, complete with conduits and power load provisioning.

West Bengal has adopted some model bye-laws at the state and municipal level in this direction. For instance, the Government of West Bengal, Department of Urban Development & Municipal Affairs (Municipal Affairs Branch) issued Notification No. 159/MA/O/C-4/3R-2/2022 dated 22 February 2023, published in the Kolkata Gazette. This notification introduced amendments to the West Bengal Municipal (Building) Rules, 2007, notably inserting a new provision under Rule 52.[41]

The amendment mandates that in large new developments—specifically, residential buildings with more than 30 flats/apartments, as well as institutional, assembly, business, industrial, storage, and mercantile buildings—charging infrastructure must be provided for 10 per cent of total parking spaces. The rule also clarifies that these provisions must include the necessary additional power load and safety factor as determined by the state government from time to time. This amendment effectively establishes a legal requirement for EV-ready parking in all major new developments across West Bengal's municipal areas governed by the 2007 Rules.[42]

Separately, the Urban Development & Municipal Affairs Department issued Notification No. 2282-T&CP/C-2/2C-17/2020 dated September 8, 2021, amending the New Town Kolkata (Building) Rules, 2009 under the New Town Kolkata Development Authority (NKDA) Act.[43] This notification is more stringent

in its EV provisions. It inserted two new clauses into Rule 23, including: Clause (D), which requires that at least 2 per cent of all car parking spaces be equipped with electric vehicle charging facilities in every plot, regardless of use group or size, with a minimum of one EV charging space mandatory for every plot, and Clause (E), which sets an even higher threshold for large developments, mandating that 20 per cent of parking spaces in plots above 10 hectares must be allotted for EV charging facilities. Importantly, the notification also provides a developer incentive by exempting these EV-dedicated spaces from Floor Area Ratio (FAR) and Ground Coverage calculations, provided that the minimum required parking spaces are met

Together, these two instruments, one state-wide and one jurisdiction-specific, establish a robust precedent for EV-ready building regulations in West Bengal. They not only mandate minimum charging infrastructure in new large buildings but also integrate EV readiness into the state's urban development legal framework, balancing obligation with incentives.

Like New Town, Kolkata and other major cities (Howrah, Asansol, Siliguri, etc.) could update their building rules to require new apartment complexes, malls, office buildings, and public parking facilities to be EV-ready—meaning adequate electrical capacity and wiring is installed for future charging points. This will alleviate the need for extra NoCs the CPOs have to take to install charging infrastructure in residential area.

Such forward-looking regulation ensures that as EV adoption rises, the infrastructure is not a bottleneck. West Bengal's EV Policy indeed highlights that cities like Kolkata, Asansol, Darjeeling, and Howrah should adopt new EV-enabling building codes and become model E-visionary cities with phase-wise goals for charging deployment.[44]

Legal adoption of these codes is the next step. The state could direct urban local bodies to approve building plans only if they adhere to EV charging provisions. This will spur private real estate developers to contribute to charging infrastructure growth. Another area requiring legal clarity is battery swapping and recycling. West Bengal should adopt or echo the Central government's rules on battery swapping standards and battery waste handling. In 2022, India brought in the Battery Waste Management Rules, 2022, which mandate responsible collection and recycling of used batteries (including those from EVs) by producers.[45] Enforcing these in the state will be crucial to address end-of-life issues and environmental safety. Additionally, the central government drafted a policy on battery swapping

recognizing it as a service and setting interoperability standards for swapped batteries.

Legal framework for charging infrastructure

By legally mandating that public chargers use standard connectors and follow safety norms, consumer confidence in the infrastructure will be higher. Another area is land use planning and allocation for charging and battery-swapping stations. Government can use its control over public land to the advantage of EV infrastructure rollout.

West Bengal is already operationalizing the concessional locations approach through WBSEDCL tenders that place charging assets on state-utility or public land and invite private investment to build and operate the stations. The state's EV Policy (June 3, 2021) explicitly directs the EV Charging Infrastructure Working Group to carve out *'Concessional Locations . . . at bare minimum lease rentals'* from existing public parking and other public sites, and to publish an initial list for rollout, thereby establishing the legal/policy basis for site allotment on favourable terms.[46]

WBSEDCL's procurement documents did implement this in practice—the July 2025 Invitation for Bid states under *'About Locations'* that *'Locations for setting Public Charging Stations (PCS) will be allotted on concessional basis initially for an engagement period . . .,'* confirming concessional allotment and a defined tenure framework for site use.[47]

Earlier bid rounds also specify the scale and siting—the August 23, 2023 WBSEDCL tender seeks private partners for the *'Supply, Installation, Operation and Management of Electric Vehicle Charging Station / Battery Swapping stations ... at WBSETCL own land (47 locations) on a revenue-sharing basis,'* and annexes a municipality-wise list of proposed EV charging locations identifying the specific plots (e.g., sub-station and municipal premises) to host the infrastructure.[48] WBSEDCL's earlier 19 October 2022 Invitation for Bid (IFB) likewise standardizes minimum technical configurations for public charging sites (e.g., at least one ≥30 kW DC fast charger plus a slow or moderate charger), aligning private deployment with uniform service levels at the allotted sites.[49]

Following through, the government can issue orders reserving parts of bus terminals, metro stations, government office complexes, etc., for installation of charging hubs. This removes a significant entry barrier for investors (the high cost of urban land). As a real example, energy companies like EESL (Energy Efficiency

Services Ltd) have tied up with states to use government office parking for chargers, and NHAI (National Highways Authority) is integrating charging stations into the new Wayside Amenities being developed on national highways via PPP.[50]

Legally, these steps involve agencies like urban development authorities or transport departments issuing notifications or agreements to allocate land or allow use of public spaces for charging facilities. West Bengal can also direct local bodies to treat charging stations as an allowable land use in zoning plans so that setting up a charger doesn't violate any municipal zoning laws. Earmarking some street parking spaces exclusively for EV charging is another tool; Kolkata could designate, say, curb-side spots with sufficient parking area with charging posts which only electric cars can use. This doubles as an incentive: priority parking for EVs.

The power supply for charging is another critical aspect governed by regulations. Fortunately, a major legal hurdle was cleared when the Ministry of Power clarified that charging EV batteries is classified as a service, not sale of electricity, which means setting up a charging station does *not* require a distribution license under the Electricity Act 2003.[51] This delinking from license obligations has been crucial in allowing private players to enter the charging market freely.

West Bengal's nodal power utility (WBSEDCL) is the State Nodal Agency for charging infrastructure rollout and will play a lead role.[52] The state's electricity regulatory commission (WBERC) has also proactively established a special electricity tariff category for EV charging; as of the latest tariff order, EV charging stations in West Bengal are billed at a single-part tariff of Rs 5.50 per kWh during off-peak hours and Rs 6 per kWh during peak hours, with no fixed demand charge.[53]

This is an important enabling policy—a moderate, time-of-day differentiated tariff makes charging affordable while encouraging charging during off-peak times (11 p.m. to 6 p.m. defined as off-peak in this case). By legally instituting this EV tariff, the state has signalled support for charging businesses and EV owners (the tariff of around Rs 5.5–6/unit is lower than many commercial tariffs).[54]

The WBERC has committed to allowing this special tariff to continue as EV adoption grows.[55] Other supportive electricity regulations could include exemption of electricity duty for power consumed at charging stations (some states waive the electricity tax for EV charging to further cut costs), and allowing open access or renewable energy use for charging providers (so that charging stations can procure

green power or excess power freely). Currently, WBSEDCL has established special EV-charging tariffs including promotional rates for stations on government-operated land (WB Notification No. EV Tariff/2019-20, Jan24, 2022).[56] Open procurement of green/renewable energy is also permitted under WBERC Order TP102 (25 March 2025).[57]

West Bengal can explore giving a 100 per cent exemption on electricity duty for EV charging stations for initial years, through a finance department order, as a number of other states have done.

Coordination between the transport and power sectors is vital. West Bengal's EV policy emphasizes creating a governance structure that brings together all relevant departments. In practice, this means when a new charging station is proposed, the process of getting electrical connection, local body permission, safety certification, etc., should be streamlined.

A possible legal step is to set guaranteed timelines for electricity connections for EV chargers. In fact, the state policy stipulates that the distribution company (DISCOM) *'shall release power supply to charging/battery swapping stations within 48 hours of application'*. If enforced, this is a very progressive move—it treats a charger installation almost like an urgent connection (similar to connections for critical facilities).

Furthermore, the state can mandate smart charging and grid-friendly charging practices through regulations. For example, large charging stations could be required to have appropriate transformers and possibly battery storage to manage load. Time-of-use pricing, as already implemented in tariff, will encourage shifting load to off-peak.

In the future, regulations could allow for vehicle-to-grid (V2G) pilots, where EVs can feed energy back —the policy document even mentions exploring smart chargers and V2G integration in the grid. While this is more advanced, the legal framework should not inhibit such innovation.

Integrating charging infrastructure into legal planning frameworks ensures that the physical backbone for EVs grows in tandem with demand. By updating building codes, allocating land, streamlining electrical connections, and setting favourable tariffs, West Bengal can rapidly expand its charging network. These legal and regulatory steps reduce the risk perceived by private investors in charging services and assure consumers that range anxiety will be addressed. The state's proactive

stance in this domain needs to be consistently enforced and updated as technology and needs evolve.

West Bengal can encourage swapping as a solution for 2W and 3W by easing any local regulatory hurdles. For instance, if a swapping provider needs a trade license or local clearance, the process should be simplified. The state policy already suggests encouraging swapping kiosks for two- and three-wheelers. Formal directives to municipalities to allow such kiosks in parking areas or fuel stations would help. It may also consider a legal framework and regulations for battery leasing, making it clear that selling EVs without a battery (with the battery leased separately) is permitted and regulated. MoRTH has clarified that selling electric two wheelers or electric three wheelers without the battery is allowed to reduce upfront costs; West Bengal should spread awareness of this rule and ensure RTOs register such vehicles (with a leased battery) smoothly.[58]

To ensure compliance and sustained progress, an institutional mechanism is helpful. West Bengal's EV Accelerator Cell (when established) could monitor the transition of government fleets and public transport, providing annual reports. The cell can also coordinate training of drivers, upgrading of depots, and maintenance facilities as buses and official vehicles go electric. The state transport department may need to update certain rules, for example, allowing electric buses to have different specifications (like battery weight or dimensions) if old rules were rigid. It could also look at route permits—since EV buses often have shorter range, routes might need adjusting or mid-day charging breaks scheduled, which is an operational detail but backed by policy support, e.g., permitting route changes or having backup buses.

By mandating fleet electrification in the public sector and key private sectors, West Bengal can create a guaranteed demand for EVs that helps economies of scale and brings down costs. This is a classic case of the government using its convening and purchasing power as a market-maker. Shenzhen's success in China, where legal directives turned the entire city bus fleet electric, showcases what is possible with strong government commitment.[59] Every electric bus on the road not only eliminates tailpipe emissions but also serves as a moving advertisement for the viability of EV technology, building public confidence. Thus, public fleet mandates are a legal tool with outsized demonstration effects in the ZEV transition.

The way forward

The current level of modest motorization, the advantage of compact city layouts, the dominance of public and para-transit in the capital region, and surplus electricity in the state create favourable conditions for rapid electrification.

Strategic policy and regulatory framework

These core recommendations establish the legal and structural foundation for the transition.

- **Adopt and enact phased BEV mandates:** Implement segment-wise ZEV sales and procurement targets, starting at modest levels and ramping up over a five-year period.
- **Segment prioritization for setting of target for electrification:** Target high-mileage commercial fleets, delivery services, public buses, two-wheelers, autos for rapid acceleration, followed by private four-wheelers.

Infrastructure and urban planning

- **Integrate EV-Ready building codes:** Incorporate EV charging provisions directly into building bylaws and development regulations.
    - o **Residential projects:** Mandate that new residential developments with more than 30 apartments provide charging infrastructure for at least **10 per cent** of parking spaces.
    - o **New Town Kolkata specifics:** Require a minimum of **2 per cent** EV-ready parking in all plots, increasing to **20 per cent** for large plots exceeding 10 hectares.
- **Expand public charging:** Take forward existing policy provisions to create a robust network of public, semi-public, and private charging stations.
- **Implement Low-Emission Zones (LEZs):** Designate specific urban zones to incentivize the use of clean and electric vehicles through restricted access for polluting vehicles.

Fiscal strategies and market mechanisms

These recommendations focus on shifting from subsidy-dependent models to self-sustaining financial mechanisms.

- **Create EV-specific financial products:** Enable flexible EMI options, leasing models, green bonds, and AI-based credit checks for vehicle financing.
- **Repurpose fiscal support:** Shift existing fiscal resources to specifically upscale EV adoption and infrastructure rather than general transport spending.

- **Implement a 'polluter-pays' tax system:** Apply specific taxes on high-emission vehicles to fund green finance initiatives and EV incentives.
- **Feebate systems:** Adopt models where surcharges on high-emission internal combustion engine (ICE) vehicles directly fund rebates for ZEV purchases.
- **Market-based credits:** Implement a credit system where manufacturers earn ZEV credits based on performance metrics (range, energy density); those with a deficit can buy surplus credits from over-compliant manufacturers.
- **Incentivize manufacturing:** Provide interest-free loans and GST reimbursements for companies establishing EV factories or business infrastructure.

Infrastructure and technical readiness

Recommendations to ensure the physical and technical environment supports a growing EV fleet.

- **EV-ready building codes:** Mandate that all new buildings are 'EV-ready' to accelerate the adoption of home charging.
- **Expand charging networks:** Fully implement and take forward existing policy provisions for public charging infrastructure.
- **Technology and R&D support:** State governments should support technological upgrades, focusing on battery durability, energy density, range, efficiency, and advanced chemistry.
- **Address logistics and freight:** Develop specific strategies to address urban freight and long-distance freight electrification.

Manufacturing, workforce, and circular economy

These focus on building a local ecosystem for production and sustainability.

- **Support for EV manufacturing:** Provide interest-free loans and GST reimbursements for companies setting up factories and business infrastructure.
- **Subsidize capital for Industry:** Offer subsidies for industrial essentials such as land, water, electricity, and testing facilities. Build an advanced, specialized workforce by creating vocational and ITI courses to train EV drivers, mechanics and charging station staff.
- **Bridge skill gaps to build local industry:** Build an advanced, specialized workforce through targeted training programmes to create new jobs in the EV sector.
- **Battery circularity and recycling:** Adopt a comprehensive reuse and recycling policy for BEV (Battery Electric Vehicle) batteries to reduce raw material needs and build a refining industry.
- **Second-life applications:** Explore and implement wide-scale applications for retired EV batteries, such as stationary battery storage and street lighting.

- **Strengthen technical standards:** Align with improved battery durability, energy density, and safety requirements (alignment with AIS-156 and AIS-038 Rev.2).
- **Implement a circular economy:** Adopt a comprehensive reuse and recycling policy for BEV batteries to ensure material security and support secondary life applications (e.g., stationary storage or street lighting).

Fleet management and scrappage

- **Leverage Fleet and scrappage renewal:** Use existing fleet renewal and vehicle scrappage programs as a primary mechanism to mandate electrification. Align vehicle replacement and fleet renewal initiatives with mandatory electrification targets.
- **Enhance public communication:** Launch targeted awareness campaigns regarding the **Total Cost of Ownership** (**TCO**) and available state/central incentives to build consumer confidence.

Institutionalize the process

- **Formalize the EV accelerator cell** as a statutory body to ensure inter-departmental coordination for land and electricity approvals within guaranteed timelines among others.
- **Institutionalize monitoring:** Establish an independent council of researchers and think tanks to monitor policy implementation and registration impacts.

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Unlike other regions with aggressive capital subsidies, West Bengal has relied less on a high-budget cash subsidy model for fleet electrification. The state has implemented temporary exemption on road tax and registration fees for new electric two-wheelers and four-wheelers, to advance price parity by one to two years. Charging point operators in West Bengal face significantly higher connection costs (nearly four times those in Delhi) and have begun developing infrastructure using fully priced strategies without major concessions. This is an opportunity to create a more organic and market-driven model to make the market more self-sustaining as the transition cannot rely permanently on purchase incentives, which are intended only to kick start the market. Therefore, a ZEV mandate can shift EVs from a 'niche option' to the default choice for manufacturers, forcing the industry to prioritize production and model diversity.

By using market competition and reducing dependence on government payouts to lower costs, the state can redirect limited public funds to critical charging infrastructure. This can be backed by performance-linked targets (range and efficiency) where manufacturers earn credits for high-quality ZEV sales. 'Banking and trading' of credits allows over-compliant manufacturers to sell their surpluses to laggards, creating private-sector incentives for rapid adoption. A ZEV mandate is legally possible through the existing overarching environmental statutes.

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