SITUATING NIGERIA'S ELECTRIC VEHICLE REGULATIONS WITHIN A LEARNING FRAMEWORK FOR THE GLOBAL SOUTH

AN UPDATE

SITUATING NIGERIA'S ELECTRIC VEHICLE REGULATIONS WITHIN A LEARNING FRAMEWORK FOR THE GLOBAL SOUTH

AN UPDATE

Authors: Anumita Roy Chowdhury and Moushumi Mohanty

Editor: Rituparna Sengupta

Cover and design: Ajit Bajaj

Layout: Kirpal Singh

Production: Rakesh Shrivastava and Gundhar Das

The Centre for Science and Environment is grateful to the Swedish International Development Cooperation Agency (Sida) for their institutional support

Citation: Anumita Roy Chowdhury and Moushumi Mohanty, *Situating Nigeria's electric vehicle regulations within alearning framwork for the Global South,* Centre for Science and Environment, New Delhi

Published by
Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Phone: 91-11-40616000
E-mail: cse@cseindia.org
Website: www.cseindia.org

Contents


EV
EV

Summary spotlight

Across the Global South, electric mobility is emerging as a strategic response to the twin imperatives of clean air and climate mitigation. Countries in Africa, Asia, and Latin America are accelerating electric vehicle (EV) programmes while simultaneously grappling with the need to develop fit-for-purpose regulatory frameworks that can enable technology deployment, guide market formation, and ensure safe and effective operations. This phase of transition has sharpened regulatory interest in shared learning, as many developing economies face common structural constraints—limited fiscal space, smaller and fragmented markets, dependence on imports, evolving technical standards, weak enforcement capacity, and nascent financing ecosystems—alongside growing pressure to deliver rapid environmental and economic outcomes.

It is within this Learning Framework for the Global South that the Centre for Science and Environment (CSE) has undertaken this report on Nigeria's evolving electric vehicle regulatory landscape. The analysis is intended to inform deliberations, meetings, and ongoing conversations under the Pan Africa Regulators Network on Clean Air and Zero Emissions Solutions, a platform initiated by CSE in 2015 to facilitate sustained knowledge exchange among regulators and stakeholders across Africa. Over the past decade, the network has enabled cross-country dialogue on emerging clean air and mobility challenges, with participation from Nigeria, Ethiopia, Kenya, Uganda, Zambia, Mauritius, Zimbabwe, South Africa, Rwanda, South Sudan, Tanzania, Zanzibar, Senegal, Côte d'Ivoire, Ghana, Egypt, Mozambique, and Malawi. As EV policies across the Global South move from ambition to implementation, the demand for timely, practice-oriented regulatory insights has become increasingly urgent.

To support this evolving exchange, CSE has initiated an action tracker series that documents emerging regulatory approaches, policy instruments, and implementation experiences in electric mobility across developing regions. This report on Nigeria forms part of that series. Conceived as a dynamic knowledge product, the action tracker provides periodic updates on policy reforms, institutional developments, and market signals, allowing policymakers and regulators to assess progress, identify gaps, and recalibrate strategies as EV ecosystems evolve. The objective is to move beyond static policy reviews and create a continuously updated evidence base that reflects real-time learning from the field.

This guidance policy framework outlines the key regulatory development in Nigeria with respect to electric vehicles and electric mobility. This includes framing technical standards, environmental regulations, and the digitalization for compliance.

This report further captures the learning curve from the e-mobility regulations, especially standards and norms for electric vehicles in India for cross learning at the early stages of electrification.

Key highlights: Nigeria's regulatory pathways for electric vehicles

Legislative anchors gathering momentum: Nigeria's Energy Transition Plan (2022) targets a net-zero economy by 2060, with EVs projected to make up 60 per cent of the national vehicle stock by 2050. The Nigerian Senate has advanced the Electric Vehicle Transition and Green Mobility Bill to its second reading. The proposed law provides a framework for phasing out petrol-powered vehicles and offers incentives such as tax holidays, duty exemptions, and toll waivers. The National Action Plan for the Development of Electric Vehicles (EVDP) targets at least 30 per cent local production by 2032.

Institutional framework, enforcement and multi-sectoral oversight: The National Automotive Design and Development Council (NADDC) is the lead agency for automotive industrialization and oversees compliance with localization targets. The Federal Ministry of Industry, Trade and Investment (FMITI) aligns the EV agenda with trade policies like the African Continental Free Trade Area (AfCFTA). The Nigerian Electricity Regulatory Commission (NERC) and Energy Commission of Nigeria (ECN) regulate electricity supply for charging infrastructure and link deployment to clean energy targets. The National Environmental Standards and Regulations Enforcement Agency (NESREA) ensure environmental compliance for battery manufacturing and recycling. Nigeria Customs Service manages documentation and applies differentiated tariff codes for EVs.

Nigeria currently lacks a single coordinating body, leading to policy overlaps. A National Electric Mobility Task Force has been proposed to harmonize these efforts.

Regulatory instruments and compliance: 2025 Import Regulations have established dealer accountability by requiring licensed importers to partner with domestic assemblers within three years of entry. Failure to comply with assembly requirements can attract penalties of up to ₦250 million, while unauthorized importers face fines of up to ₦500 million. Foreign automakers must achieve at least 30 per cent local content in production.

Technical standards: The Standards Organization of Nigeria (SON) is aligning domestic standards for EVs and batteries with global benchmarks like ISO and IEC.

Fiscal incentives and cost benefits: The 2025 framework slashes import duties on EVs to 10–20 per cent, down from the historical 70 per cent applied to fully built vehicles. EVs are exempt from value added tax (VAT) and the import adjustment tax (IAT).

Operating savings: While upfront costs are higher (₦12–₦28 million for EVs vs. ₦6–₦15 million for petrol), daily operating costs for EVs are roughly one-third of petrol vehicles.

Market trends and infrastructure expansion: There is substantial growth potential. The EV market, valued at USD 58 million in 2024, is projected to reach USD 230 million by 2030. Six EV manufacturing companies are already operating in Nigeria, including Jet Motor Company and Innoson Vehicle Manufacturing. Private firms like NEV Electric plan to deploy 300 charging stations across Abuja and Lagos by mid-2025.

Challenges and opportunities: Adoption is impeded by limited charging infrastructure and an unreliable national power grid. Low public awareness and consumer confidence regarding battery range remain significant hurdles. The National Automotive Design and Development Council (NADDC) and Customs are developing a centralized digital registry to track EV imports and production to improve data compliance and transparency.

Circular economy: Growing battery waste streams present an opportunity to develop a domestic recycling industry for materials like lithium and cobalt.

Strategy for dealers and buyers: Buyers are advised to prioritize post-2016 models to minimize duty rates and select vehicles with high ground clearance for local terrain. Dealers are advised to invest in after-sales infrastructure, technician training, and digital sales platforms to build consumer trust.

Standards, certification, and technical compliance: Ensuring the safety and performance of the EV ecosystem is a primary regulatory focus. The Standards

Organization of Nigeria (SON) which is the central body responsible for developing and enforcing national standards for EVs, batteries, and chargers. Nigeria has begun aligning domestic standards with international benchmarks: It is taking on board ISO 6469 for general electric vehicle safety and IEC 61851 for electric vehicle conductive charging systems.

Assembler certification: Certification for manufacturers and assemblers involves mandatory conformity testing and quality assurance audits. Under the Green Mobility Bill, licensed assemblers must produce a minimum of 5,000 vehicles per year while adhering to international safety norms. All imported EVs must obtain a Standards Organization of Nigeria Conformity Assessment Programme (SONCAP) certification to enter the market.

Charging infrastructure: Nigeria is moving from concept to early-stage deployment of charging infrastructure. The EVDP targets the installation of approximately 3,000 charging stations annually after 2030. NEV Electric plans to deploy 300 charging stations across Abuja and Lagos by mid-2025. The Energy Commission of Nigeria (ECN) launched a 5-kilowatt solar-hybrid charging hub in Abuja capable of charging four vehicles simultaneously. The Standards Organization of Nigeria (SON) is aligning domestic standards for charging systems with global benchmarks like IEC 61851.

Environmental and end-of-life regulations: As the number of EVs grow, managing hazardous waste—specifically lithium-ion batteries is a critical priority. The National Environmental Standards and Regulations Enforcement Agency (NESREA) is developing guidelines for the handling, storage, and recycling of batteries. The Federal Ministry of Environment (FME) plans to integrate EV battery management into the National Waste Management Policy to promote material recovery and secondary markets for lithium and cobalt. The Hazardous Waste Control Guidelines include strict standards for battery collection and transportation to prevent environmental contamination. It remains to be seen how Extended Producer Responsibility (EPR) framework that mandates that manufacturers and importers remain responsible for the environmental impact of their batteries across their entire lifecycle, is incorporated.

Digitalization and data compliance: Modernizing the tracking of vehicle life cycles and compliance through digital tools is essential for a transparent market. This includes:

- **Centralized digital registry**: The NADDC and Nigeria Customs Service (NCS) are jointly developing a digital platform to track imported EVs, domestic production volumes, and compliance with localization targets.

- **Single window trade portal**: This registry will be integrated with the national trade portal, allowing for real-time verification of **vehicle identification number** (**VIN**) data and import documentation.
- **National EV data repository**: In the long term, this platform is expected to capture data on charging infrastructure performance and emissions displacement, which is critical for international climate reporting.
- **Pre-arrival assessment**: Importers are encouraged to use the **pre-arrival assessment report** (**PAAR**) system to submit documents electronically, reducing clearance delays and bottlenecks.

Table 1: Summary of key targets and penalties

Category	Requirement / goal	Penalty for non-compliance
Local content	**30 per cent** local content in production	**₦ 250 million** per violation
Import status	Mandatory partnership with local assemblers within three years	**₦500 million** fine and goods confiscation
Vehicle age	Only vehicles manufactured from **2015** onward are eligible	License suspension or fines
Infrastructure	**3,000** charging stations annually after 2030	N/A (Projected target)

Despite recent progress, several structural barriers continue to constrain e-mobility adoption. Institutional responsibilities are fragmented across industrial, transport, energy and environmental agencies, with no single body providing overall coordination. Infrastructure gaps persist, and an unreliable national grid with frequent outages limits the feasibility of large-scale EV charging. High upfront vehicle and infrastructure costs remain a significant deterrent. Low public awareness contributes to range anxiety and consumer hesitation, while technical capacity gaps—particularly the shortage of certified technicians and limited regulatory expertise in high-voltage systems and battery management—further impede market development.

Key highlights from India for cross learning

The regulations, incentive schemes and standards for EVs are evolving rapidly in India. This represents an important learning curve for those embarking on the programme now. India's electric vehicle (EV) transition highlights a strategic focus on high-impact segments, performance-linked incentives, and a robust localization agenda. Some of the key features are as follows:

Segment-specific prioritization: India has concentrated its efforts on small, high-usage vehicles such as two-wheelers and three-wheelers, as well as high-occupancy public transport. Two-wheelers account for over 75 per cent of total vehicle sales and 60 per cent of petrol consumption, making it a natural entry point for electrification. Three-wheelers, an important para transit mode, has emerged as the frontrunner, with penetration reaching 54 per cent in FY 2023–24.

Strategic focus on public transport buses for zero emissions commuting: Strategies include bulk purchase by transit agencies and demand aggregation, specifically targeting 50,000 electric buses by 2027 under the National Electric Bus Programme.

Learning from the EV fiscal incentive programme FAME (Faster Adoption and Manufacturing of Electric Vehicles) that is evolving since 2015 in stages. There have been several cycles of course correction, refinement, and adoption of new approaches to make the system more effective. In addition to this, Government of India has also implemented production-linked incentives to promote the local manufacturing of EVs.

FAME I incentive (2015) led to the removal of incentives for mild hybrids and lead-acid batteries, which offered marginal benefits and compromised zero emissions transition. Subsequently, incentives were tied only with battery-operated vehicles with a small support for the strong hybrids.

Performance-linked incentive: During the FAME II stage (2019 onwards), incentives were linked to battery capacity and performance parameters of the EVs, like range and efficiency.

Tapering support: Under the fourth phase of demand incentives, PM E-DRIVE scheme (2024), incentives have been gradually scaled down in line with market maturation and declining technology costs, particularly for two-wheelers.

Innovated bus financing: Several financing approaches have been adopted to enable quicker adoption while reducing the cost of transition. For buses, this model allows private operators to own and maintain fleets while authorities pay a per-kilometer fee, spreading capital risk. Secondly, demand aggregation model has been adopted to collectively negotiate with the manufacturers to lower the costs. This has helped to bring near price parity with the diesel and CNG vehicles.

Infrastructure and business models: The delicensing of public charging stations has democratized infrastructure provision. Standards and guidelines have been adopted. Battery swapping, especially for three-wheelers, has been implemented.

Swapping reduces upfront costs by 30–40 per cent and improves operational convenience.

Localization and industrial policy and Production-linked Incentive (PLI) scheme has been adopted for local manufacturing for advanced chemistry batteries and auto components: Production-linked Incentive (PLI) scheme for Advance Cell Chemistry aim to establish 50 GWh of domestic battery capacity; the scheme features a two-year gestation period (starting from 1 January, 2023, or specific appointment dates) for setting up manufacturing facilities, followed by a five-year incentive disbursement period. Beneficiaries must achieve 25 per cent domestic value addition within two years, rising to 60 per cent within years. The PLI for auto components is implemented over a five-year period, spanning from FY 2023–24 to FY 2027–28. There is Phased Manufacturing Programme (PMP) that mandates the domestic assembly of specific components to qualify for incentives.

Financing the transition: Polluter-pays principle–dedicated revenue pools, such as Delhi's air ambience cess on diesel, are used to fund charging infrastructure and fiscal incentives.

Outline of the EV-related regulations in India that can help to inform the standards setting process in Nigeria

India significantly overhauled its safety testing protocols following multiple electric vehicle (EV) fire incidents in 2022. These updates transitioned the country from basic battery testing to a rigorous, system-level safety architecture. Some of the key standard setting initiatives are as follows:

Revised safety standards: India replaced the older AIS 048 standard, which was designed for lead-acid batteries and lacked environmental testing, with more stringent regulations:

- **AIS 156**: Specific safety requirements for L-category vehicles, which include two-wheelers, three-wheelers, and quadricycles.
- **AIS 038 (Revision 2)**: Safety requirements for M-category (passenger cars) and N-category (goods vehicles).

Enhanced technical protocols: Following government investigations into thermal runaway incidents caused by low-grade cells and inadequate management systems, new amendments were introduced in two phases starting December 2022:

1. Cell-level safety

- **Traceability**: Manufacturers must clearly specify the date of manufacture on every cell in a **DDMMYY** format to ensure quality control.
- **Design**: Adequate cell-to-cell spacing is now mandated within battery packs to prevent heat transfer between cells.
- **Certification**: Cells must be tested by NABL-accredited laboratories according to IS 16893 Parts 2 and 3.

2. Battery management system (BMS) requirements

- **Smart BMS**: All units must be microprocessor-based and provide protection against overcurrent, overcharge, over-discharge, over-temperature, and short circuits.
- **Monitoring**: The BMS must include a data-logging feature and have at least four temperature sensors placed strategically to obtain true thermal readings.
- **Alert systems**: Vehicles must have an audio-visual warning that alerts the driver at least five minutes before a potential thermal event like a fire or explosion.

3. Battery pack and thermal management

- **Thermal propagation test**: This critical test ensures that if a single cell undergoes thermal runaway, the design prevents it from propagating to other cells.
- **Ingress protection**: Battery packs must achieve an IPx7 rating, ensuring they are protected against water ingress—a necessity for India's tropical and monsoon conditions.
- **Pressure management**: Every pack must include a pressure relief valve (PRV) or vent to release gaseous leaks and prevent pressure build-up.

4. Charger and communication

- **Soft-start function**: Chargers must feature a soft-start function to prevent sudden current surges.
- **Smart communication**: The battery pack and charger must communicate via a **CAN bus** or similar port to manage charging cycles safely.

Phased implementation and Compliance

- **Phase 1** (**Dec 2022**): Focused on immediate hardware changes like pack traceability, additional fuses, and microprocessor-based BMS.
- **Phase 2** (**March 2023**): Introduced advanced requirements including active parallel circuits, thermal propagation tests, and EMC testing for the BMS.
- **Mandatory for incentives**: Compliance with these standards is now a prerequisite for manufacturers to claim subsidies under the FAME II, PLI, and PM E-DRIVE schemes.

In India, the AIS 156 and AIS 038 (Rev 2) standards mandate a specific thermal propagation test to verify that a single cell thermal runaway does not lead to a fire or explosion of the entire battery pack.

Trigger methods for thermal runaway: To verify compliance, testing agencies use standardized methods to 'force' a cell into thermal runaway:

- **Primary trigger** (**heating initiation**): A heating device, such as a block heater or film heater, is used to apply concentrated heat to a selected cell.
  - **Block heater**: If a block heater the same size as the cell is used, one component cell is replaced by the heater.
  - **Film heater**: This is attached directly to the surface of the initiation cell.
  - **Heating procedure**: The heater is powered to its maximum and initiation stops only when thermal runaway occurs or the temperature exceeds 300°C. This limit must be reached within 30 minutes.
- **Alternative trigger** (**over-charging**): If heating is not technically feasible, a single-cell over-charging method can be employed.

Detection and monitoring criteria: A thermal runaway event is officially 'judged' to have occurred if at least two of the following conditions are met:

- **Voltage drop**: A sudden drop in the measured voltage of the initiation cell.
- **Temperature threshold**: The temperature exceeds the maximum operating limit defined by the manufacturer.
- **Temperature rise rate**: The rate of temperature increase is greater than or equal to **one degree centigrade**.

Critical safety outcomes: The purpose of these triggers is to evaluate the system's ability to contain the failure:

- **No fire or explosion**: Even if the triggered cell enters thermal runaway, there must be no external fire or explosion from the battery pack.
- **Early warning system**: The vehicle must activate an **audio-visual warning** at least **five minutes** before any potential fire or explosion occurs.
- **Selection strategy**: Test agencies select the cell nearest to the center of the casing or one surrounded by other cells, as these locations make it most difficult for heat to dissipate, representing a 'worst-case' scenario.

The way forward

To sustain momentum and achieve long-term decarbonization goals, several strategic pathways are needed for the Global South, including Nigeria and India. Clearly, there is an enormous opportunity to learn from each other on the regulatory pathways to inform local manufacturing and import of vehicles and product development. This will require cross learning on design of fiscal incentives and financing instruments to meet the cost of transition.

For rapid market development and rapid growth of local manufacturing, regulatory targets and mandates are needed to drive competition, product development, reduce cost pressure and to make the transition revenue neutral.

Infrastructure reliability is critical. Moving from simply counting chargers to ensuring high uptime, interoperable standards, and integration with renewable energy (e.g., solar mini-grids).

Policy stability and long-term policy visibility is critical. Avoiding abrupt changes in subsidies that disrupt market growth and consumer confidence; instead, transitioning gradually to non-fiscal measures like zero-emission mandates.

As the EV programme begins to mature, it will soon lead to battery waste that needs to be recycled to not only minimize environmental hazards but also material recovery. This requires battery circularity. Implementing a 'battery passport' system and Extended Producer Responsibility (EPR) should ensure 90 per cent material recovery and reduce environmental risks.

Skill and innovation are needed to enable the transition. Embedding EV maintenance and high-voltage training into technical vocational programmes to prepare the workforce for new industry. This can generate job and livelihood security.

Develop specialized training for customs and standards officers and introduce digital monitoring tools to track localization.

Incentivize charging networks. Introduce standardized licensing for operators and encourage public–private partnerships (PPPs) to develop charging corridors.

Focus on high-impact segments. Prioritize the electrification of high-usage, mass-mode transport like buses para transit and local commercial vehicles to maximize environmental benefits.

Support local R&D. Establish EV innovation hubs in collaboration with universities to develop locally appropriate technologies like modular battery systems.

PART I

THE CASE OF NIGERIA

1. The case of Nigeria

Nigeria represents a critical case within this Global South learning framework. As Africa's largest economy[1] and one of its most significant vehicle markets, the country is at a pivotal juncture in its mobility transition. Rising fuel import bills, foreign exchange pressures, worsening urban air pollution, and the imperative for economic diversification have converged to elevate electric mobility as a national priority. EVs are increasingly positioned not only as a clean transport solution, but also as an instrument for industrial renewal, skills development, and alignment with Nigeria's long-term low-carbon development pathway.

Recent policy and regulatory developments point to a clear shift in direction. Nigeria's Energy Transition Plan[2] (ETP), launched in 2022, charts a pathway toward a net-zero economy by 2060, with electric vehicles projected to constitute 60 per cent[3] of the national vehicle stock by 2050, and reach full penetration by 2060. This vision is complemented by the National Action Plan for the Development of Electric Vehicles (EVDP), which targets at least 30 per cent local production by 2032 and the installation of around 3,000 charging stations annually after 2030. These measures are designed to build an integrated ecosystem that links clean energy supply, manufacturing, and consumer adoption. Currently, there are six electric vehicle manufacturing companies that have begun operating in Nigeria.

At the same time, Nigeria's vehicle market, estimated at over 1.1 million[4] new and used vehicles annually, remains heavily import-driven. This highlights the regulatory complexity of managing an EV transition in developing economies. Balancing affordability, environmental performance, industrial policy objectives, and consumer protection demands carefully sequenced regulatory interventions. Understanding how Nigeria is navigating these trade-offs—and how its approach compares with experiences from other Global South contexts such as India—is essential for anticipating implementation challenges and avoiding policy lock-ins.

The 2025 vehicle import framework establishes a new foundation for the domestic EV market by tightening compliance requirements and promoting investment in local assembly and value chains. This framework signals the government's intent to move away from a purely import-dependent model toward one that emphasizes manufacturing, skills development, and sustainable transport infrastructure.

The United States dominates the supply of used passenger cars and spare parts, while China leads in the import of new vehicles and components. Japanese brands, valued for their reliability and fuel efficiency, continue to account for nearly 70 per cent of the market share. This dependence on imports has long constrained the development of domestic manufacturing capacity, highlighting the importance of regulatory reform in fostering local production and technology transfer.

From this perspective, this report examines Nigeria's EV regulatory landscape not in isolation, but as part of a broader Global South transition. By situating Nigeria's emerging regulations within a shared learning framework, the analysis aims to support informed discussion within the Pan Africa Regulators Network on Clean Air Solutions and contribute to collective efforts to design effective, equitable, and context-responsive electric mobility policies across the developing world.

1.1 Institutional momentum is building up in the legislative sphere

The Nigerian Senate has advanced the Electric Vehicle Transition and Green Mobility Bill[5] to its second reading, underscoring national commitment to low-carbon mobility. The proposed law, sponsored by Senator Orji Uzor Kalu, seeks to strengthen both the automotive and energy sectors by providing a coherent regulatory framework for phasing out petrol-powered vehicles. It offers a range of incentives for manufacturers, importers, and consumers, such as tax holidays, duty exemptions, toll waivers, and targeted subsidies, to encourage investment and adoption of EVs.

The bill also introduces stringent requirements for foreign automakers and importers. Overseas manufacturers will be required to partner with Nigerian firms, set up assembly facilities within three years of entry, and achieve at least 30 per cent local content in production. Failure to comply could attract penalties of up to ₦250 million per violation, while unauthorized importers risk fines as high as ₦500 million along with confiscation of goods. Furthermore, licensed assemblers will be mandated to produce a minimum of 5,000 vehicles annually, conforming to international safety and performance standards. These provisions are designed to position Nigeria as a competitive hub for EV manufacturing and regional supply across Africa.

Building on these legal reforms, the 2025 Electric Vehicle Import Regulations[6] further strengthen dealer accountability. Licensed importers are now required to work with certified assemblers and establish domestic operations within a defined timeframe ensuring that vehicle imports contribute directly to local value addition. The regulations also introduce stricter customs procedures, including a structured vehicle identification umber (VIN) valuation system that eliminates discretionary duty negotiations and enforces minimum clearing costs. Higher import duties on vehicles older than 12 years discourage the influx of outdated, high-emission cars, while modest duty reductions for electric and hybrid vehicles signal a policy shift toward cleaner transport options. Together, these measures reflect a broader regulatory strategy that aims not only to stimulate market growth but also to embed local value creation, ensure consumer protection, and align Nigeria's mobility transition with its broader industrial policy goals.

1.2 Institutional framework and enforcement mechanisms

Nigeria's regulatory framework for electric vehicles is evolving through a network of overlapping mandates spread across industrial, transport, energy, and environmental agencies. The emerging institutional architecture reflects both the opportunities and the challenges of coordinating a multi-sectoral transition toward electric mobility. While policy intent is clear, ensuring coherence, accountability, and effective enforcement remains a work in progress.

At the core of Nigeria's EV institutional structure is the National Automotive Design and Development Council (NADDC),[7] which serves as the lead agency for automotive industrialization. The NADDC's mandate covers setting standards, technology promotion, and the implementation of the National Automotive Industry Development Plan (NAIDP 2023–2033). Under this plan, the Council is tasked with facilitating local EV assembly, establishing testing and homologation centers, and supporting skill development programmes for technicians and engineers. It also oversees compliance with localization targets and works with customs authorities to verify conformity with import regulations.

NADDC operates under the umbrella of Federal Ministry of Industry, Trade and Investment (FMITI) which coordinates the broader policy framework that links automotive production with investment incentives and trade policy. FMITI's role is particularly crucial in aligning Nigeria's EV agenda with broad-based initiatives such as the African Continental Free Trade Area (AfCFTA), which offers opportunities for regional value chain integration and export growth. Through fiscal coordination with the Federal Inland Revenue Service and the Ministry of Finance, FMITI ensures that duty exemptions, tax holidays, and other incentives under the EV Transition Bill are effectively implemented.

Energy governance, another critical dimension of EV policy, falls primarily under the Nigerian Electricity Regulatory Commission (NERC) and the Energy Commission of Nigeria (ECN). NERC is responsible for licensing and regulating electricity supply for EV charging infrastructure, ensuring that distribution companies integrate EV loads into network planning, and promoting renewable-powered charging models. The ECN, in turn, provides technical guidance for linking EV deployment with Nigeria's clean energy targets, such as the 30:30:30[8] vision of achieving 30 gigawatts of electricity generation with 30 per cent sourced from renewables by 2030. Together, these institutions bridge the gap between transport electrification and national energy transition goals.

Environmental oversight is provided by the Federal Ministry of Environment (FME) and the National Environmental Standards and Regulations Enforcement Agency (NESREA), which are responsible for ensuring that EV-related activities—such as battery manufacturing, recycling, and end-of-life vehicle management—comply with environmental standards. NESREA's role is expected to expand as battery waste streams grow, necessitating the development of dedicated regulations for lithium-ion battery collection, reuse, and recycling. The Ministry's participation in the Extended Producer Responsibility (EPR) framework will be central to building a circular economy around EV components.

Enforcement of customs and import regulations rests with the Nigeria Customs Service (NCS), which manages the documentation, clearance, and valuation of imported EVs and components. The Service now applies differentiated tariff codes for electric and hybrid vehicles, reflecting Nigeria's 2025 import framework. Through digital systems such as the Pre-Arrival Assessment Report (PAAR) and the Nigeria Single Window Trade Portal,[9] the NCS aims to streamline import processes and reduce compliance bottlenecks. Collaboration between customs, NADDC, and the Standards Organisation of Nigeria (SON) is also crucial for verifying vehicle authenticity, safety compliance, and conformity with national and international standards.

Despite this institutional spread, Nigeria still lacks a single coordinating body dedicated to electric mobility. Fragmented responsibilities have sometimes resulted in policy overlaps and inconsistent enforcement. For example, licensing procedures for charging stations and the certification of imported EV parts often involve multiple agencies with varying procedural requirements. These gaps highlight the need for a National Electric Mobility Task Force or Commission, a proposed inter-ministerial body that could harmonize policies, oversee implementation, and maintain a central database of EV sales, imports, and infrastructure deployment.

For Nigeria's EV regulation to move from intent to impact, enforcement capacity must be strengthened across agencies. This includes developing specialized training for customs and standards officers, creating a transparent compliance reporting system for manufacturers and importers, and introducing digital monitoring tools to track localization and safety targets. Equally important is the institutionalization of periodic policy reviews—allowing Nigeria to update its regulatory instruments in response to technological advances, global best practices, and market realities.

A cohesive and accountable institutional framework will therefore be the cornerstone of Nigeria's electric mobility transition. With clear mandates, better inter-agency coordination, and robust enforcement, the regulatory system can evolve from fragmented oversight to a coherent governance structure that supports innovation, investment, and environmental sustainability.

1.3 Regulatory instruments and compliance architecture

Nigeria's transition toward electric mobility is being steered by a growing set of regulatory instruments that define how vehicles, components, and related infrastructure are produced, imported, and used. These instruments form the backbone of the country's electric vehicle (EV) governance ecosystem—linking industrial policy with fiscal incentives, environmental standards, and trade regulations. While many of these frameworks are still evolving, they collectively signal a decisive move toward structured, compliance-based oversight of the emerging EV market.

Legislative anchors and policy direction

At the legislative level, the Electric Vehicle Transition and Green Mobility Bill[10] represents the first comprehensive attempt to codify Nigeria's low-carbon transport strategy. The bill seeks to phase out petrol-powered vehicles and establish clear timelines for the adoption of electric alternatives. It introduces statutory provisions for fiscal incentives—such as tax reliefs, import duty waivers, and toll exemptions—to attract investment and lower entry barriers for EV users. Importantly, it also imposes performance and localization obligations on both domestic and foreign assemblers, thereby integrating industrial and environmental objectives within a single legal framework.

Complementing the Bill is the National Automotive Industry Development Plan (NAIDP 2023–33), which provides the industrial policy foundation for Nigeria's vehicle electrification efforts. The NAIDP emphasizes local assembly, technology transfer, and component manufacturing through a system of graded incentives and compliance requirements. It also outlines the establishment of Automotive Supplier Parks—industrial clusters designed to support EV manufacturing through shared infrastructure, logistics, and testing facilities. These instruments work in tandem to create a predictable regulatory environment and a structured pathway for local capacity building.

Import controls and localization requirements

The 2025 Electric Vehicle Import Regulations serve as the principal compliance framework for vehicle imports, establishing mandatory obligations for importers, assemblers, and dealers. Under these rules, all licensed importers must partner with certified local assemblers and are required to establish domestic assembly operations within three years of commencing business. Non-compliance may result in fines exceeding ₦1 million per infraction or suspension of import licenses. These measures are designed to encourage backward linkages and stimulate local production.

Customs oversight has been strengthened through the introduction of differentiated tariff lines for fully electric, hybrid, and internal combustion engine (ICE) vehicles. This allows the Nigeria Customs Service[11] (NCS) to monitor import patterns more effectively and apply preferential tariffs to EVs and related components. Importers are now encouraged to conduct pre-import assessments using vehicle identification numbers (VINs) to ensure accurate valuation and compliance with new clearance procedures. These changes reflect a broader policy intent—to gradually shift Nigeria from an import-dependent automobile market to a localized production ecosystem.

Import duties, cost benefits, and fiscal incentives

The new import regime substantially reduces the fiscal burden on EV importers. Historically, fully built vehicles attracted a 70 per cent[12] tariff—comprising a 35 per cent import duty and an equivalent levy. The 2025 framework slashes this to between 10–20 per cent for EVs, alongside a 15 per cent National Automotive Council (NAC) levy. Importantly, electric vehicles are exempt from value added tax (VAT) and the import adjustment tax (IAT), resulting in significant cost savings.

For instance, a USD 7,500 EV priced at an exchange rate of ₦1,500 per dollar would benefit from substantial reductions compared to traditional combustion vehicles, given these exemptions. Additionally, a 0.5 per cent ECOWAS Trade Levy applies, but overall, Nigeria's tax structure now positions EVs as considerably more affordable.

Beyond duties, the government has extended broad-based fiscal incentives to stimulate demand and industrial growth. Duty exemptions introduced in January

2024 cover EVs, steel, and related manufacturing inputs. The upcoming Electric Vehicle Transition and Green Mobility Bill (2025) further reinforce these measures through reduced import duties, corporate tax breaks, and local investment incentives. The National Automotive Design and Development Council (NADDC) targets 30 per cent local EV production by 2033—a goal already reflected in Lagos State's USD 260 million investment to deploy 1,000 EVs under the LagRide programme.

Market trends, consumer costs, and growth outlook

Nigeria's new vehicle market grew by 18.9 per cent in 2023, reaching over 13,000 units, with increasing traction in the EV segment. Buyers can leverage VAT and IAT exemptions, making EVs more competitive and transparent in pricing. Average shipping costs from China remain predictable (30–45 days), with total freight expenses of approximately USD 1,600 per container.

While upfront costs remain a challenge—EVs currently range from ₦12–28 million compared to ₦6–15 million for petrol vehicles—operational savings are compelling. Charging a 60 kWh battery costs around ₦10,000, compared to ₦50,000–75,000 for refueling a comparable petrol car. Daily operating costs are estimated at ₦48–60 per 100 km, roughly one-third of petrol vehicle costs.

Market challenges and emerging opportunities

Despite these advantages, the EV ecosystem faces significant hurdles. Limited charging infrastructure and a shortage of certified technicians impede adoption, while complex import procedures add to transaction costs. Public awareness and consumer confidence also remain low, leading to 'range anxiety,' and hesitation among potential buyers.

Nevertheless, Nigeria's EV market, valued at USD 58 million in 2024, is projected to reach US230 million by 2030—over ₦1.6 trillion. Major infrastructure developments are underway: NEV Electric plans to deploy 300 charging stations across Abuja and Lagos by mid-2025 and produce 2,000 high-capacity EVs and 10,000 micro EVs. The Energy Commission of Nigeria (ECN) has launched a five-kilowatt solar-hybrid charging hub in Abuja capable of charging four vehicles simultaneously, demonstrating early models for decentralized clean energy integration.

Building a competitive strategy for dealers and buyers

To succeed, both buyers and dealers must align with policy trends and evolving compliance norms. Buyers should prioritize post-2016 EV models to minimize duty rates, select vehicles with extended ranges and high ground clearance, and confirm VIN valuations early to forecast costs. Dealers, meanwhile, should invest in after-sales infrastructure, training programmes for technicians, and partnerships with local banks to offer leasing or rent-to-own models.

Providing portable charging kits or solar-inverter-enabled solutions can help overcome infrastructure gaps and build consumer trust. Digital sales platforms such as EV24.africa are critical enablers—offering transparent pricing, warranty details, and financing options that streamline the customer experience.

Regulatory and fiscal frameworks for sustainable market entry

Compliance remains central to successful market participation. Under the 2025 rules, only vehicles manufactured from 2015 onward are eligible for import, with all EVs requiring Standards Organization of Nigeria Conformity Assessment Programme (SONCAP) certification.[13] The Pre-Arrival Assessment Report (PAAR) system enables importers to submit documents electronically for early customs evaluation, helping reduce clearance delays.

Electric vehicles also benefit from substantial fiscal relief: exemptions from VAT and IAT, plus moderate import duties (10–20 per cent) and a 15 per cent NAC levy. Furthermore, under the Nigeria Tax Act 2025, small companies with annual turnover below ₦100 million are exempt from corporate income tax, and a streamlined four per cent development levy applies to profits. Together, these measures lower market-entry barriers for startups and SMEs venturing into EV assembly, component supply, and logistics.

Standards, certification, and technical compliance

Ensuring safety, performance, and environmental integrity within the EV ecosystem requires robust technical regulation. The Standards Organization of Nigeria (SON)[14] plays a central role in this area, developing and enforcing national standards for EVs, batteries, chargers, and associated components. Working with the NADDC, SON has begun aligning domestic standards with global benchmarks such as ISO 6469 (for electric vehicle safety) and IEC 61851 (for charging systems). This alignment is crucial for promoting interoperability between imported and locally manufactured products.

Certification procedures for EV assemblers now include conformity testing, quality assurance audits, and compliance verification for minimum production volumes—set at 5,000 vehicles per year under the Green Mobility Bill. Assemblers and component manufacturers must demonstrate adherence to technical standards before products can enter the Nigerian market. These mechanisms not only safeguard consumers but also help establish Nigeria's credibility in regional trade under the African Continental Free Trade Area (AfCFTA) framework.

Environmental and end-of-life regulations

As EV adoption grows, the management of end-of-life batteries and vehicle components has become a regulatory priority. The National Environmental Standards and Regulations Enforcement Agency (NESREA) is developing complementary guidelines for the handling, storage, and recycling of lithium-ion batteries under the Extended Producer Responsibility (EPR) framework. These guidelines aim to ensure that manufacturers and importers remain responsible for the environmental footprint of their products across their entire lifecycle.

Additionally, the Federal Ministry of Environment (FME) has proposed the integration of EV battery management into the National Waste Management Policy[15], linking it with Nigeria's circular economy agenda. The inclusion of reuse and recycling provisions is expected to reduce environmental risks, promote secondary markets for recovered materials, and create employment opportunities in the green industrial sector.

Digitalization and data compliance

A key emerging area of regulation is the digitalization of compliance and reporting systems. The NADDC and NCS are jointly developing a centralized digital registry to track imported EVs, domestic production volumes, and compliance with localization targets. This registry will be integrated with the Nigeria Single Window Trade Portal, allowing for real-time verification of import documentation and VIN data. In the longer term, the platform could support a National EV data repository, capturing information on charging infrastructure, vehicle performance, and emissions displacement—critical for policymaking and international reporting.

Taken together, these regulatory instruments mark a decisive shift from ad hoc policy interventions toward a structured, rules-based governance system. The success of Nigeria's EV regulation will depend not only on the robustness of these instruments but also on the capacity of institutions to enforce them consistently and transparently. As Nigeria builds out its compliance architecture, the priority will be to balance regulatory certainty with market flexibility—creating conditions that attract investment while ensuring environmental and consumer protection.

2. Implementation challenges and coordination between institutional stakeholders

Despite the promising evolution of Nigeria's electric vehicle (EV) regulatory ecosystem, translating policy frameworks into tangible outcomes remains a complex undertaking. While the country has laid an ambitious foundation through legislative and industrial policy reforms, implementation continues to face structural, institutional, and operational challenges. These challenges stem not only from capacity constraints and weak coordination among agencies but also from the broader economic and infrastructural realities shaping Nigeria's transport and energy systems.

2.1 Fragmented institutional responsibilities

The governance of EVs in Nigeria cuts across multiple sectors—transport, industry, power, and environment—each managed by different institutions with overlapping mandates. The National Automotive Design and Development Council (NADDC) leads automotive industrialization, while the Federal Ministry of Industry, Trade and Investment (FMITI) drives investment policy. The Nigerian Electricity Regulatory Commission (NERC) oversees charging infrastructure, the Standards Organization of Nigeria (SON) handles technical compliance, and NESREA manages environmental enforcement.

However, these agencies often operate within parallel policy silos, with limited cross-sectoral coordination. For instance, while NADDC regulates assembly standards, NERC's approval process for EV charging installations operates under a different legal instrument, leading to procedural misalignments. The absence of a central coordinating mechanism or inter-ministerial task force means that policy directives are often implemented unevenly, and accountability for outcomes remains diffuse. This fragmentation has slowed progress on unified standards, data sharing, and national planning for charging networks.

2.2 Limited institutional capacity and technical expertise

Effective regulation of electric mobility demands technical proficiency in areas such as high-voltage systems, battery management, charging protocols, and environmental safety. Most regulatory institutions in Nigeria still lack the requisite expertise and human capital to manage these new technological domains. Agencies such as SON and NESREA have begun developing internal capacity, but progress remains uneven and heavily dependent on donor-supported training or pilot projects.

Customs and port authorities also face challenges in classifying and inspecting EVs and components due to limited familiarity with emerging technologies. This lack of expertise increases the risk of regulatory loopholes, under-declaration, and non-compliance with safety standards. Without sustained investment in institutional capacity building—through technical training, international partnerships, and standardized procedures—implementation of EV policy will continue to lag behind legislative ambition.

2.3 Infrastructure and energy supply constraints

The effectiveness of EV regulation is also constrained by Nigeria's infrastructure deficit, particularly in electricity generation, transmission, and distribution. The national grid remains unreliable, with frequent outages and limited capacity to accommodate additional loads from EV charging. NERC's regulatory framework for EV charging stations is still in the pilot phase, and large-scale deployment of chargers will require significant upgrades in distribution infrastructure and load management systems.

Moreover, the high upfront cost of setting up charging stations and limited access to concessional finance have discouraged private sector participation. Without adequate coordination between energy planners and transport regulators, Nigeria risks developing an EV policy that outpaces its physical and energy readiness, thereby undermining consumer confidence and market growth.

2.4 Weak compliance monitoring and data systems

Nigeria's regulatory institutions are still building the digital infrastructure needed to monitor compliance effectively. Although the NADDC and NCS have initiated work on a centralized registry for EV imports and assembly, data collection remains fragmented and often manual. This lack of reliable data makes it difficult to track localization progress, evaluate fiscal incentives, or measure the environmental benefits of EV adoption.

Furthermore, existing enforcement mechanisms are reactive rather than preventive. Inspections tend to occur after non-compliance is detected, rather than through proactive, risk-based monitoring. This approach increases administrative burden and delays resolution, especially in customs and environmental regulation. Developing an integrated digital compliance system, coupled with standardized reporting templates and real-time data exchange between agencies, would significantly strengthen Nigeria's enforcement capacity.

2.5 Policy uncertainty and investor confidence

While Nigeria's EV policy direction is broadly supportive of industrial growth, uncertainty around implementation timelines, incentive disbursements, and regulatory enforcement has affected investor confidence. Some provisions of the Electric Vehicle Transition and Green Mobility Bill remain under legislative review, and delays in finalizing associated regulations have created ambiguity for investors assessing long-term risk.

Similarly, inconsistent application of import tariffs and localization requirements has resulted in operational uncertainty for assemblers and dealers. The private sector has expressed concern that frequent policy shifts, uncoordinated licensing procedures, and slow approvals for charging infrastructure may discourage sustained investment. Ensuring policy stability—through transparent regulations, predictable incentive frameworks, and clear institutional mandates—is critical to unlocking the next phase of Nigeria's EV industrial development.

2.6 Need for a coordinated governance mechanism

A recurring theme across Nigeria's EV policy landscape is the absence of a unified governance mechanism capable of synchronizing the actions of multiple institutions. Establishing a national electric mobility commission or task force, chaired by the Office of the Vice President or coordinated through the National Council on Climate Change (NCCC), could provide the needed oversight and coherence. Such a body would integrate policy planning, infrastructure development, and fiscal management under a single institutional umbrella, ensuring that EV deployment aligns with broader goals of industrialization, energy security, and climate resilience.

Nigeria's EV regulation has made significant strides at the conceptual and legislative levels, but the challenge now lies in converting policy frameworks into implementable action. Addressing institutional fragmentation, capacity gaps, and infrastructure bottlenecks will be essential for ensuring that the transition to electric mobility delivers on its economic and environmental promises. A coordinated governance structure—anchored in data transparency, regulatory accountability, and technical competence—will determine the success of Nigeria's emerging EV regulatory regime.

3. Policy opportunities and strategic pathways

Nigeria's evolving electric vehicle (EV) framework presents a unique opportunity to shape a transport transformation that aligns economic competitiveness with environmental sustainability. The country's regulatory and institutional foundations—though still developing—offer the basis for a coordinated, market-enabling transition. Unlocking this potential will depend on how effectively Nigeria leverages its policy instruments, institutional capacities, and regional partnerships to drive investment, innovation, and social inclusion.

3.1 Strengthening regulatory coherence and governance

The foremost opportunity lies in creating an integrated governance model for electric mobility. Establishing a national electric mobility commission or council, with representation from key ministries and regulatory agencies, could provide the strategic coordination currently lacking. This body would harmonize standards, synchronize incentives, and oversee implementation across industrial, energy, and environmental domains.

Institutional coherence would also ensure that fiscal measures—such as import duty waivers, tax incentives, and local content requirements—are applied uniformly. By integrating EV governance into the broader framework of Nigeria's Energy Transition Plan and Nationally Determined Contributions (NDCs), the government can align sectoral policies with national climate goals and global reporting obligations.

3.2 Accelerating infrastructure development and energy integration

Expanding the EV charging network is central to both consumer confidence and industrial growth. Nigeria's target of installing 3,000 chargers annually after 2030 provides a strong starting point, but meeting this target will require new financing models and regulatory clarity on electricity tariffs and grid integration.

The Nigerian Electricity Regulatory Commission (NERC) can play a catalytic role by introducing standardized licensing frameworks for charging operators, promoting renewable-powered charging stations, and enabling third-party energy sales. Public–private partnerships (PPPs) should be encouraged to develop charging corridors along major highways, urban centers, and logistics hubs. Integrating these networks with renewable generation—especially solar mini-grids—could reduce strain on the national grid and support decentralized energy access.

3.3 Deepening local manufacturing and supply chain development

Nigeria's industrial base can benefit significantly from EV localization if supported by targeted incentives and technology partnerships. The National Automotive Design and Development Council (NADDC) and the Federal Ministry of Industry, Trade and Investment (FMITI) could expand the scope of the Automotive Supplier Parks model to include dedicated EV clusters focused on battery pack assembly, motor production, and component recycling.

Encouraging partnerships between Nigerian assemblers and established global EV manufacturers would facilitate technology transfer, while simultaneously creating employment and skill development opportunities. A clear local content roadmap, with transparent evaluation metrics and phased targets, would provide predictability to investors and ensure that localization is both feasible and commercially viable.

3.4 Promoting circular economy and environmental stewardship

Nigeria's EV policy presents an opportunity to embed circular economy principles at an early stage of market development. The National Environmental Standards and Regulations Enforcement Agency[16] (NESREA), working with the Federal Ministry of Environment (FME), could establish a comprehensive regulatory framework for battery collection, reuse, and recycling. Incentivizing private investment in recycling infrastructure would not only mitigate environmental risks but also unlock secondary value from recovered materials such as lithium, nickel, and cobalt.

Introducing a battery passport system—linking production, import, and end-of-life tracking through a digital registry—would enhance traceability and support compliance with international sustainability standards. Over time, these measures could position Nigeria as a regional leader in EV battery recycling and materials recovery.

3.5 Fostering innovation, skills, and research

Building a competitive EV industry requires a strong foundation in research, design, and innovation. Establishing EV Innovation Hubs in collaboration with universities, polytechnics, and technology parks could accelerate the development of locally appropriate technologies—such as affordable two- and three-wheel electric vehicles, modular battery systems, and solar-integrated charging solutions.

Targeted funding programmes, administered through agencies like the Bank of Industry (BoI) and TETFund, could support R&D collaborations between academia and industry. Skills development should also be embedded into Nigeria's technical and vocational education programmes to prepare technicians, engineers, and maintenance professionals for new roles within the EV value chain.

3.6 Leveraging regional and international collaboration

Nigeria's position as West Africa's largest economy provides a strategic advantage for regional EV leadership. Alignment with ECOWAS transport and energy frameworks could facilitate cross-border harmonization of standards, interoperability of charging systems, and shared infrastructure investments. Participation in African Continental Free Trade Area (AfCFTA) value chains would open export opportunities for Nigerian-assembled EVs and components, provided domestic standards remain consistent with international benchmarks.

International climate finance mechanisms—such as the Green Climate Fund (GCF), Global Environment Facility (GEF), and emerging carbon markets—could also be leveraged to fund EV infrastructure and research programmes. Partnerships with development agencies and multilateral institutions would help reduce financing risks and support institutional strengthening.

3.7 Policy and industrial linkages across Africa

Nigeria's EV tax and regulatory model is part of a broader African trend to localize electric mobility. South Africa offers energy-efficiency tax credits and capital allowances for renewable equipment, while Kenya exempts solar and wind infrastructure under its Finance Act 2021. Madagascar provides a particularly progressive model—combining VAT exemptions with accelerated depreciation for EV importers, enhancing capital recovery.

Across the continent, countries are using a mix of fiscal tools and import regulations to stimulate domestic EV markets. Kenya restricts imports to right-hand drive vehicles under eight years old, while Ghana exempts EVs entirely from import duties. Ethiopia, meanwhile, banned new internal combustion engine imports in 2024, accelerating EV transition.

3.8 Nigeria's EV industrial base and manufacturing ecosystem

Nigeria's domestic EV manufacturing capability is taking shape through multiple private-sector initiatives. Companies like SAGLEV, Spiro, Electric Motor Vehicle Company (EMVC), Jet Motor Company, and Innoson Vehicle Manufacturing (IVM) are at the forefront of localized assembly, battery pack production, and mobility services.

- SAGLEV operates an assembly plant in Ikorodu, Lagos, targeting 10,000 EVs annually.
- Spiro plans to produce 100,000 electric bikes and three-wheelers from its Ogun State plant by 2025.
- EMVC, based in Kogi State, manages an end-to-end system from battery production to charging and swap networks.
- Innoson, Nigeria's first indigenous automaker, now assembles EVs alongside ICE vehicles in Anambra State.

These players are not just manufacturing vehicles—they are shaping a domestic EV ecosystem that connects renewable energy, mobility innovation, and local employment.

3.9 Policy opportunities and strategic outlook

Nigeria's evolving EV policies offer a strong platform for green industrialization. The government's 10-year tax exemption for local EV manufacturers, five-year relief for component assemblers, and VAT waivers on batteries and charging equipment create favorable conditions for investors. The nation's long-term zero-emission vehicle roadmap—committing to 100 per cent zero-emission sales for new cars and vans by 2040—provides a clear policy signal.

To sustain this momentum, Nigeria must strengthen coordination between its transport, energy, and industrial agencies, standardize safety and performance norms, and scale renewable-powered charging networks. Unlocking value from domestic lithium reserves and enabling local battery production could make EVs more affordable while reducing foreign dependency.

4. The Way Forward

Nigeria stands at a pivotal juncture in its mobility transition. The policy, industrial, and environmental choices made over the next decade will determine whether the country becomes a passive technology adopter or an active participant in shaping Africa's clean mobility future. With coherent regulation, strong institutional coordination, and sustained investment in human and physical capital, Nigeria has the potential to transform its transport sector into a cornerstone of sustainable industrialization.

The regulatory journey will not be without challenges, but with a forward-looking governance approach that balances innovation with accountability, Nigeria can lay the groundwork for an inclusive, low-carbon, and globally competitive electric mobility ecosystem.

The 2025 EV import and manufacturing reforms mark a strategic pivot toward sustainable mobility and industrial transformation. Lower tariffs, targeted fiscal incentives, and growing investor confidence are laying the groundwork for a resilient electric mobility market. Yet success will depend on execution—streamlined regulations, workforce development, financing innovation, and the rapid deployment of charging infrastructure.

If these elements align, Nigeria could emerge as West Africa's EV manufacturing hub by 2030—anchoring regional trade, reducing emissions, and driving the next phase of industrial growth.

PART II

REGULATORY LEARNING CURVE IN INDIA

5. Regulatory learning curve in India

Countries in the Global South are finding their distinct ways to design demand and purchase incentives for consumers and fleet operators to build markets, incentivize industry to produce, designing charging infrastructure, evolving battery chemistries, and developing funding strategies to meet the cost of transition. A learning curve is gradually evolving that needs to be tapped to inform each other and enable each other. There is great value in adopting learnings on cell chemistry, battery pack design, thermal management systems, and the associated regulatory framework for safe and optimal use of the battery in an EV.

There are several common approaches that are unique to developing countries. Most countries in Africa and Asia, with lower level of personal vehicle ownership, are prioritizing mass modes of transport to decarbonize urban commuting. The transport system in these countries is marked by high-usage, high-occupancy vehicles like taxis, buses, microbuses, paratransit like matatus, *tuktuks* etc, and ride-share fleet to maximize emissions and carbon reduction benefits. Electrifying small para transit that meet the maximum travel demand, focusing on two-wheeled vehicles that are most polluting and dominate the vehicle fleet, targeting the commercial fleet operations for delivery and the aggregator fleet to maximize impacts. This ties in well with the electrification landscape of India which has also taken a similar approach. This opportunity has also created enormous demand to shape enabling policies, regulations, technology roadmap and policy accelerators to build scale.

The Indian journey of regulation in the EV sector with regard to the updating of the standards from lead acid batteries to lithium-ion batteries, and the subsequent amendments in response to fire incidents, can be a starting point for this conversation with Nigeria and other African countries.

The lessons learnt from EV adoption across various vehicle segments in India can be shared with Nigerian counterparts to anticipate roadblocks and avoid mistakes. Specifically, the phased implementation of the demand incentive FAME schemes (FAME 1 in 2015, FAME 2 in 2019, followed by EMPS and PM E-Drive in 2024) have sparked momentum of two and three-wheeler market which have seen significant EV penetration. The E2W market registered 6.2 per cent[17] share in FY 2025.

The share of battery-powered two wheelers in fact rose from 6 per cent in 2024 to a high of 8.1 per cent[18] between January and September 2025. But these figures did not sustain in the October to December quarter as cuts announced in goods and services taxes made ICE vehicles more attractive and EVs witnessed a decline in EV share. This pulled overall electric two-wheeler penetration for the full year down to 6.3 per cent.

The electric three-wheeler market on the other hand comprised 57 per cent[19] of total three-wheeler sales in FY2025 compared to 54 per cent in FY2024.

There is considerable learning in India that has prioritized support for electrification of buses and is working with strategies of bulk purchase by transit agencies and demand aggregation.

India has also adopted different business models including a gross cost contract that allows the bus manufacturers or a third-party agency to provide the service of fleet operations and to take responsibility of maintenance and operations. Once the purchase incentive schemes created a critical mass for EV demand, India started to focus on supply side incentives such as the production linked incentive (PLI) scheme for cell and auto component manufacturing. This is expected to provide the much-needed thrust of localization of EV manufacturing.

Nigeria, which relies significantly on imports, will also require local capacity for cell manufacturing, battery assembling and advanced battery chemistry. An early R&D and manufacturing roadmap, even as the EV market begins to take off, is crucial. Attention needs to be paid quite early to these details while developing regulations and incentive programmes to be able to plan funding and financing strategies in advance. Nigeria is also adopting industrial policy to build local vehicle manufacturing bases to cater to the regional markets, retail value chain within the economy, create new and green jobs with related economic spin offs.

A critical determinant of electric vehicle (EV) adoption is the availability, discoverability, and accessibility of charging infrastructure. In India, two key policy interventions have played a catalytic role in accelerating charging deployment: the delicensing of public charging stations, which democratized infrastructure provision by allowing multiple actors to participate, and the introduction of differentiated electricity tariffs for EV charging, which lowered operating costs and provided a direct fiscal incentive for use. Battery swapping has also gained traction as a complementary solution, particularly for high-usage segments, although challenges remain in the rollout of interoperable swapping standards.

These experiences offer valuable insights for African countries, many of which share similar urban forms, travel patterns, and settlement morphologies.

India's experience also demonstrates how the polluter-pays principle can be used to mobilize domestic resources for financing the EV transition. In Delhi, an Air Ambience Cess is levied on every litre of diesel sold, alongside an environmental pollution charge on diesel cars with engine capacities of 2,000 cc and above, and an environmental compensation charge on daily truck entries into the city. While each levy is modest, together they have generated a substantial and dedicated revenue pool that is now being used to fund charging infrastructure and provide fiscal incentives for electric mobility. This approach illustrates the potential of small, well-designed environmental levies to create sustainable financing mechanisms for the transition to cleaner transport.

The multidimensional nature of the e-mobility ecosystem—spanning infrastructure, fiscal policy, regulation, and market design—creates opportunities to compare and adapt policy formulations, pilot projects, financing strategies, and regulatory frameworks across contexts. A central lesson from India's experience is the importance of continuously reviewing policy impacts on ground-level EV adoption and undertaking timely course correction.

This learning is particularly evident in the evolution of India's demand incentive programmes. The latest iteration, the Prime Minister's Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) scheme, announced in September 2024 and effective until March 2026, is backed by a funding allocation of Rs 11,000 crore. While it continues to support electric two- and three-wheelers, albeit with reduced emphasis, the scheme prioritizes electric buses and charging infrastructure. For the first time, it also introduces demand incentives for electric trucks and e-ambulances, signaling a strategic shift toward high-impact and commercial vehicle segments.

Earlier phases of the incentive programme highlight how incentive design can shape market outcomes—both positively and negatively. The first phase of the Faster Adoption and Manufacturing of Electric Vehicles (FAME I), launched in 2015, suffered from regulatory and operational shortcomings. Mild hybrids, which offer only marginal fuel and emissions benefits, were initially made eligible for incentives. As a result, in the first year alone, Rs 40 crore of the Rs 70 crore demand incentive budget was absorbed by mild hybrids. Over four years, they accounted for nearly 95 per cent of car sales supported under FAME I. Similarly, the scheme differentiated incentives based on battery type, with lower support for conventional batteries such as lead-acid and higher support for advanced batteries such as lithium-ion. However, the cost advantage of lead-acid batteries led to their dominance in the two-wheeler segment, limiting the environmental benefits of the programme. These distortions prompted the withdrawal of incentives for mild hybrids in 2017 and for lead-acid batteries in 2018.

The second phase, FAME II, launched in 2019, reflected a decisive course correction. With a significantly larger budget, the scheme linked incentives to vehicle performance parameters, including minimum range, energy efficiency, top speed, and acceleration. Incentives were also tied to battery capacity, with clearly defined segment-wise support levels. FAME II focused primarily on commercial and high-usage vehicles—such as buses, three-wheelers, and fleet-operated vehicles—while retaining limited support for electric two-wheelers, which were emerging as a fast-growing segment at the time. The introduction of explicit electrification targets by vehicle segment further sharpened policy intent.

The transition from FAME I to FAME II illustrates how performance-based eligibility criteria and segment-specific incentives can refine market outcomes and better align public spending with policy objectives. India's experience underscores that demand incentives must be precisely targeted to promote the desired technologies—such as fully electric vehicles with advanced batteries—without inadvertently encouraging suboptimal alternatives. Equally important is the need for consistency and predictability in subsidy policy. Frequent or abrupt changes in incentive structures can distort demand, disrupt markets, and undermine consumer confidence, ultimately slowing the pace of EV adoption.

For example, in response to an ensuing FAME 2 subsidy reduction in June 2023, E2W manufacturers either partially or fully passed on the amount of subsidy markdown to the consumer by raising the prices of their vehicles, which caused E2W sales to slow considerably.

The experience with the Electric Mobility Promotion Scheme (EMPS) also serves as a cautionary tale about the risks of abrupt policy changes. The sharp reduction in incentives and the sudden narrowing of eligible vehicle categories led to a slowdown in market growth, emphasizing that any phase-out of fiscal support must be gradual, well-communicated, and accompanied by non-fiscal measures which translate to preferential treatment for EVs in urban settings, and supply side drivers such as zero-emission mandates. Rapidly changing policies create uncertainty in the EV ecosystem and make it challenging for stakeholders like manufacturers, investors, and consumers to undertake long-term planning, which risks slowing down the transition.

5.1 Setting vehicle-specific targets and adoption strategies

India's electric vehicle transition has been shaped by the recognition that its automotive market is highly diverse and stratified, making a uniform policy approach neither efficient nor fiscally sustainable. With finite public resources, policy design has focused on prioritizing vehicle segments where electrification can deliver the greatest environmental and economic returns under prevailing local conditions. As a result, India's EV strategy has concentrated on small, high-usage vehicles—such as two- and three-wheelers—as well as high-occupancy and commercial transport segments, including taxis, buses, and paratransit fleets, where emissions reductions per vehicle are maximized.

Focus on two- and three-wheelers

Two-wheelers dominate India's vehicle landscape, accounting for more than 75 per cent of total vehicle sales in FY 2022–23 and contributing to nearly 60 per cent of petrol consumption. India is also the world's largest manufacturer of two-wheelers, giving it a significant comparative advantage in scaling domestic EV manufacturing. This combination of market size, production capacity, and relatively low battery requirements has made two-wheelers a natural entry point for electrification, with faster prospects for price parity with internal combustion engine (ICE) models.

The initial expansion of electric two-wheelers (e2Ws) was driven largely by commercial applications such as last-mile and hyperlocal deliveries, where total cost of ownership (TCO) parity with ICE vehicles was achieved early due to lower operating and maintenance costs. Partnerships between e-commerce platforms, logistics aggregators, and fleet operators, along with corporate fleet electrification commitments, have further reinforced this trend. As market penetration increased and economies of scale began to emerge, the government progressively tapered demand incentives to avoid market distortions and reduce fiscal dependence.

Under FAME II, incentives for e2Ws were set at Rs15,000 per kWh, capped at 40 per cent of vehicle cost. In June 2023, this was reduced to Rs 10,000 per kWh with a cap of 15 per cent, followed by a further reduction under the Electric Mobility Promotion Scheme (EMPS) in March 2024 to Rs 5,000 per kWh, capped at Rs 10,000 per vehicle. Under the PM E-DRIVE scheme, incentives are scheduled to taper further to Rs 2,500 per kWh or a maximum of Rs 5,000 per two-wheeler in 2025, reflecting growing market maturity and declining technology costs.

The electric three-wheeler (e3W) segment has emerged as the frontrunner of India's EV transition. EV penetration in this segment reached approximately

54 per cent[20] in FY 2023–24—the highest across all vehicle categories. Growth has been led by sub-segments such as e-rickshaws, e-carts, goods carriers, and passenger autorickshaws, with e-rickshaws rapidly replacing cycle rickshaws in many Tiers I and II cities as last-mile feeders. With TCO estimated to be around 40 per cent lower than ICE three-wheelers, driven by low operating costs and rising fuel prices, electrification has become commercially compelling, particularly for last-mile passenger and goods delivery.

Battery swapping has further strengthened the business case for e3Ws, especially in fleet operations. By decoupling battery ownership from vehicle purchase, swapping reduces upfront vehicle costs by 30–40 per cent[21] while offering refueling convenience comparable to ICE vehicles. Controlled charging environments also improve battery health and enable more systematic battery reuse and end-of-life management, enhancing both operational efficiency and environmental outcomes.

Targeted electrification of public transport buses

Public transport buses have been a central pillar of India's electrification strategy, given their potential to decarbonize a large share of daily urban travel and significantly reduce local air pollution. Fixed routes, depot-based parking, and predictable operating schedules make buses particularly well suited for electrification. Early experience under FAME I informed a more strategic and scalable approach in FAME II, which expanded coverage to 40 cities with a planned deployment of 7,000 electric buses—nearly eight times the scale of the first phase.

Two key policy innovations underpinned the rapid scale-up of electric buses. The first was the adoption of the Gross Cost Contract (GCC) procurement model, made mandatory for accessing FAME II subsidies. Under GCC, a private operator owns, operates, and maintains the buses, while the public transport authority pays a fixed per-kilometre fee over the contract period. This model spreads capital costs over the vehicle lifecycle, aligns revenues with operating expenses, and distributes deployment risks between the public and private sectors. Given that nearly 90 per cent of India's registered buses are privately owned, GCC has been critical in addressing the private sector's initial reluctance to invest in higher-cost electric buses.

The second innovation was demand aggregation to achieve economies of scale. The central government assigned this role to Convergence Energy Services Limited (CESL), which aggregated demand from nine major cities and launched the 'Grand Challenge' tender in 2022 for the deployment of 5,450 electric buses—one of the largest such tenders globally. This approach led to significant cost reductions, with per-kilometre operational costs discovered to be 23–27 per cent lower than diesel or CNG buses even without subsidies, and 31–35 per cent lower in cities receiving central support. Building on this success, the National Electric Bus Programme (NEBP) was launched with a target of deploying 50,000 electric buses by 2027.

5.2 EVs as industrial policy

Promoting localization of components

Beyond transport decarbonization, India has increasingly positioned electric mobility as an industrial development strategy aimed at maximizing domestic value addition, employment generation, and supply-chain resilience. EVs comprise three core component systems—batteries, electric motors, and power electronics—each critical to cost, performance, and competitiveness. Localizing these components is essential for reducing import dependence, lowering costs, and mitigating supply-chain risks.

However, localization has been challenging due to gaps in India's hardware manufacturing ecosystem. While original equipment manufacturers (OEMs) have achieved limited Tier-1 localization, deeper Tier-2 and Tier-3 supply chains remain underdeveloped. To address this, the government has deployed a coordinated policy toolkit, including localization-linked incentives under FAME II and PM E-DRIVE, phased manufacturing targets under the Phased Manufacturing Programme (PMP), and supply-side support through the Production Linked Incentive (PLI) schemes for advanced chemistry cells and auto components.

India has also used calibrated trade and investment policies to attract global manufacturers. In the context of negotiations with Tesla, the government announced a conditional import policy allowing reduced customs duties on completely built-up electric vehicles—from 70 per cent to 15 per cent for five years—subject to the establishment of a local manufacturing facility with a minimum investment of USD 500 million within three years and 50 per cent domestic value addition within five years. This approach reflects a strategic attempt to balance near-term market access with long-term localization objectives.

Taken together, India's experience demonstrates the importance of segment-specific targeting, performance-linked incentives, and industrial policy alignment in shaping an effective EV transition. These lessons offer valuable insights for other Global South economies seeking to maximize environmental gains while building domestic manufacturing capacity and resilient EV ecosystems.

Ensuring compliance with localization norms

The FAME II scheme was supported by a Phased Manufacturing Programme (PMP) aimed at strengthening domestic manufacturing of electric vehicle components in India. Under this framework, 18 specified components were permitted for import by original equipment manufacturers (OEMs) up to a defined deadline, beyond which localization was mandated to qualify for incentives. All other EV components were required to be manufactured or assembled domestically. In parallel, FAME II discouraged the import of completely knocked-down (CKD) kits for two- and three-wheelers by announcing a phased increase in basic customs duty (BCD), thereby nudging manufacturers towards local production.

However, in 2023, irregularities in localization claims under FAME II came to light. Government investigations revealed that six EV manufacturers had deliberately violated PMP guidelines by using imported components while claiming incentives meant for locally manufactured products. In response, the PM E-DRIVE scheme has retained the PMP framework but introduced tighter compliance provisions. The revised PMP guidelines, currently in draft form, are more stringent than earlier versions, reducing the number of components eligible for import from 18 to eight for two- and three-wheelers. These developments underscore the importance of instituting regular audits and verification mechanisms to ensure compliance with localization norms throughout the manufacturing process.

Addressing barriers in the battery supply chain and recalibrating industrial policy

To accelerate domestic battery manufacturing, the government launched the Production Linked Incentive Scheme for Advanced Chemistry Cell Battery Storage (PLI-ACC) in 2021. The scheme links incentives to production volumes, encouraging firms to scale manufacturing capacity. With an outlay of Rs 18,100 crore over five years, the programme aims to establish 50 GWh of domestic battery manufacturing capacity by 2026.

Several companies, including Ola Electric, Amara Raja, JSW Neo Energy, Reliance Industries, Lucas TVS, and Waaree Energies, have secured allocations under the PLI-ACC scheme. While many of these firms have announced access to cell technologies through in-house development or technology partnerships, scaling these technologies to full commercial production remains a significant challenge. A major constraint is India's heavy dependence on imported critical minerals such as lithium, nickel, cobalt, and graphite, as well as reliance on imported cell manufacturing equipment. Additionally, shortages of skilled labor across multiple stages of the battery value chain further complicate localization efforts.

Targeted government support for the localization of specific battery components—such as cathodes, anodes, electrolytes, metal foils, casings, and cell manufacturing equipment—could lower entry barriers for firms and enable gradual vertical integration. This approach would allow companies to participate in the value chain with relatively modest capital investment while strengthening domestic manufacturing depth.

Rationalization of taxation on electric vehicles

Beyond purchase subsidies, rationalization of taxation has been a key fiscal lever to incentivize EV adoption. At the national level, electric vehicles attract a goods and services tax (GST) of only 5 per cent, compared to 28 per cent for hybrids and up to 49 per cent for internal combustion engine (ICE) vehicles. However, GST on EV batteries and charging services remains at 18 per cent, which undermines affordability and dampens cost competitiveness. Rationalizing these rates would further strengthen the EV value proposition.

At the state level, road taxes on conventional vehicles typically range from 5 to 15 per cent. Several states, including Maharashtra and Uttar Pradesh, have exempted EVs from road tax, while others—such as Andhra Pradesh and Delhi—have withdrawn earlier exemptions. Evidence suggests that the withdrawal of tax waivers has had an immediate and negative impact on EV sales, highlighting the sensitivity of demand to fiscal incentives and the importance of policy consistency.

Developing robust regulations and standards for EV programmes

Technology transitions require strong regulatory frameworks and technical standards to ensure performance, safety, durability, and energy efficiency. For countries developing manufacturing bases, standards must be embedded within the policy and legislative process, allowing laws to focus on long-term objectives while technical rigor is addressed through detailed specifications.

Electric vehicles present unique regulatory challenges, as they combine characteristics of both road vehicles and electrical devices. In India, the Ministry of Road Transport and Highways (MoRTH) serves as the nodal agency for implementing the Motor Vehicles Act and Central Motor Vehicles Rules (CMVR), supported by expert technical committees on safety and emissions. The Automotive Research Association of India (ARAI), established in 1966, functions as a key testing and certification agency and publishes Automotive Industry Standards (AIS) that OEMs are required to comply with.

Harmonizing domestic standards with global regulations

India has progressively aligned its automotive standards with international frameworks. Since the late 1960s, domestic standards have drawn from global bodies such as ISO, DIN, and EEC. A major milestone was India's accession in 2006 to the UNECE WP-29 agreement, which promotes harmonized Global Technical Regulations (GTRs) to facilitate cross-border acceptance and trade. Indian AIS standards are technically aligned with UNECE regulations, with adaptations for local conditions.

The Bureau of Indian Standards (BIS), established under the BIS Act, 2016, plays a central role in standards development and is a member of the International Electrotechnical Commission (IEC). BIS has issued EV charging standards (IS 17017) derived from the IEC 61851 series, while also developing India-specific standards to account for local vehicle diversity and climatic conditions.

Strengthening battery safety regulations

Early EV safety standards, such as AIS 048, were designed primarily around lead-acid battery technologies and lacked a system-level safety approach. Environmental testing of batteries was also absent, despite India's harsh operating conditions. With the growing adoption of lithium-ion batteries, newer standards—AIS 038 (Rev 2) for M and N category vehicles and AIS 156 for L category vehicles—were introduced, aligned with international benchmarks such as ECE R100 and ECE R136. These standards integrate high-voltage electrical safety with battery safety requirements and specify construction, design, and performance parameters.

Following a series of EV fire incidents in 2022, regulatory scrutiny intensified. Investigations revealed quality issues related to low-grade cells and inadequate battery management systems (BMS) that failed to prevent thermal runaway. Subsequent amendments strengthened requirements for battery cells, BMS, onboard chargers, battery pack design, and thermal propagation controls.

5.3 E-retrofitment of ICE vehicles: A distinct challenge for the Global South

Interest in retrofitting older ICE vehicles with electric propulsion systems has grown across several African countries and Indian states, driven by cost considerations, startup innovation, and judicial directives to phase out ageing ICE vehicles. While electrification of new vehicles remains the priority, retrofitment presents a transitional pathway that warrants careful regulation.

India's emerging regulatory framework seeks to prevent unsafe and ad hoc retrofitment practices by defining certification requirements, performance benchmarks, and safety standards (AIS 123). Although retrofitment is not incentivized at the national level, several states, including Delhi, Assam, Rajasthan, Tamil Nadu, and Uttar Pradesh, have incorporated retrofitment provisions into their EV policies. Delhi stands out for having a defined eligibility framework, although implementation remains limited.

The retrofitment industry in India is nascent, dominated by small firms and startups operating in select urban centres. Challenges include high certification costs, limited testing capacity, model-specific homologation requirements, and low consumer awareness. Aligning retrofitment standards with updated battery safety regulations, expanding testing infrastructure, and rationalizing certification costs are critical to scaling the sector.

While retrofitment offers lower upfront costs compared to new EVs, safeguards are essential to ensure vehicle integrity and safety. Effective screening of candidate vehicles, stringent enforcement of standards, and stronger consumer protection mechanisms are necessary. State-level incentives, where provided, should be linked to performance outcomes and audit requirements, and supported by appropriate financing instruments.

Need for coordinated institutional mechanisms

Recognizing the cross-sectoral nature of electric mobility, India established the National Mission on Transformative Mobility and Battery Storage (NMTMBS) in 2019. Led by NITI Aayog, the mission brings together multiple ministries and agencies to coordinate policy, standards, and implementation. This institutional architecture has underpinned flagship initiatives such as FAME II and the ACC PLI scheme, while facilitating industry consultation and inter-agency coordination, particularly in charging infrastructure and R&D ecosystems.

Role of sub-national policies in driving adoption

All Indian states have notified EV policies that complement national programmes with state-specific incentives and regulatory measures. These policies reflect local priorities and vary widely in targets, incentive structures, manufacturing support, and funding strategies. Common elements include demand- and supply-side incentives, charging infrastructure support, industrial promotion, recycling provisions, and review mechanisms.

State-level policies deploy a mix of fiscal incentives—such as purchase subsidies, tax exemptions, interest subvention, and scrappage support—and non-fiscal measures, including preferential parking, low-emission zones, and public awareness campaigns. Together, these instruments play a critical role in shaping EV adoption patterns and demonstrate the importance of decentralized policy design within a federal framework.

This policy approach combines tiered incentives linked to the scale of EV investments, with differentiated support for large, mega, and ultra-mega projects, including joint ventures that integrate vehicle manufacturing with battery production. Capital subsidies are extended across multiple layers of the EV value chain, calibrated to the size and nature of investments, while select states provide enhanced incentives for cleaner production processes or for investments in priority sub-sectors. A wide range of tax and duty concessions further reduce costs for manufacturers, including waivers or reimbursements on stamp duty, state GST, road tax, and registration fees, along with interest subvention, interest-free loans, and concessional financing.

Infrastructure-related support typically includes subsidies to offset fixed power charges, discounted electricity tariffs, reduced water charges, and reimbursement of land conversion fees. Additional incentives are offered for effluent treatment systems, workforce training, and market development. Start-ups are often given preferential treatment through dedicated funding windows, earmarked budgets, and infrastructure-related benefits. Several states facilitate land allocation for EV parks equipped with plug-and-play infrastructure such as common effluent treatment plants, dedicated power supply, water facilities, and EV testing and certification centres. Research and development are supported through grants and funding for technology acquisition, with some states offering customized incentive packages for large-scale battery manufacturing. Pilot initiatives focused on clean energy integration, wireless charging, and smart mobility applications are also being encouraged to align electric mobility with broader urban transport planning. Collectively, these measures seek to stimulate the growth of EV manufacturing by addressing investment risk, infrastructure gaps, and innovation needs.

Skill development and innovation programmes

States have also embedded skill development into their EV strategies by offering training and reskilling support for contractors, technicians, and assembly-line workers. Complementary measures include the creation of seed and venture capital funds, financial incentives linked to job creation, and employer contributions to provident fund schemes. Employment-linked incentives, reskilling allowances, and transition support for workers moving from ICE-related industries to EV-related roles are increasingly being recognized as essential components of a just and inclusive transition.

Recycling and reuse of batteries

Approaches to battery recycling and reuse vary widely across states. While some have introduced financial incentives, mandatory labelling, buy-back arrangements, and provisions for setting up recycling facilities, others have yet to articulate clear strategies. Policy measures to date have largely focused on labelling requirements and collection mechanisms, with a few states expressing intent to establish dedicated battery industrialization hubs. This uneven landscape highlights the need for clearer and more consistent sub-national frameworks for battery end-of-life management.

Dedicated EV funds

Only a limited number of states have created dedicated EV funds or identified stable revenue streams to capitalize them. Establishing such a fund signals long-term political and fiscal commitment to vehicle electrification. EV funds can be financed through direct budgetary allocations or through feebate mechanisms that penalize polluting ICE vehicles while rewarding cleaner alternatives. Delhi provides a notable example, having initiated steps to operationalize a dedicated EV fund anchored in the polluter-pays principle. Under this approach, inefficient and high-emitting vehicles incur surcharges, while cleaner vehicles receive rebates. Revenue sources proposed for Delhi's EV fund include a pollution cess on diesel (the Air Ambience Fund), a graded road tax structure with higher rates for diesel vehicles, congestion charges on ride-hailing and aggregator trips using ICE vehicles, and environment compensation charges.

5.4 Circular economy: Enabling recycling of end-of-life batteries

As electric mobility begins to scale across Africa, it presents a unique opportunity to embed sustainability into the transport system from the outset. Establishing a circular battery ecosystem is critical—not only to maximize recovery of valuable materials, but also to prevent heavy metals and other hazardous substances from entering landfills and contaminating the environment. This is equally important from the perspective of long-term material security.

Given that many African countries are still at an early stage of EV adoption, future volumes of end-of-life batteries remain uncertain. While waste flows are expected to remain relatively modest in the near term, they are likely to rise sharply as EV market share increases. In addition, it is estimated that up to three million used electric vehicles could enter African markets by 2050 from countries in the Global North, further amplifying the importance of battery circularity.

India's experience offers useful insights into building a regulated recycling ecosystem. Battery management in India has been regulated since 2001 under the Batteries (Management and Handling) Rules, with a major expansion in scope introduced through the Battery Waste Management Rules, 2022. These rules extend beyond lead-acid batteries to include lithium-ion batteries used in EVs and cover all actors across the value chain, including manufacturers, importers, assemblers, dealers, recyclers, refurbishers, service centres, and consumers.

A central feature of the 2022 Rules is the introduction of Extended Producer Responsibility (EPR). Producers—defined to include battery manufacturers, importers, and automakers placing batteries on the market—are obligated to ensure the collection, recycling, or refurbishment of batteries at end of life. This responsibility can be discharged directly or through authorized third-party agencies, but producers must ensure that waste batteries are routed only to registered recyclers. Annual reporting of sales and buy-back data to State Pollution Control Boards is mandatory, along with compliance with safe storage and transportation norms.

For the first time, the rules establish time-bound and measurable targets for collection and material recovery, ultimately aiming for 90 per cent recovery of battery materials. Interim targets require 70 per cent recovery by 2024–25 and 80 per cent by 2026, rising to 90 per cent from 2026–27 onwards. Producers are also required to progressively incorporate recycled material into new batteries, starting at 5 per cent by 2027–28 and increasing to 20 per cent by 2030–31. For imported cells, compliance can be met through equivalent utilization of recycled materials or export of an equivalent quantity.

To strengthen enforcement and transparency, the EPR framework is administered through a centralized online portal managed by the Central Pollution Control Board (CPCB). This platform enables producers to contract recyclers, track compliance, and obtain EPR certificates based on verified recycling volumes.

However, the EPR framework faces a critical hurdle: undervalued EPR certificates. Currently, certificate prices are too low to cover the actual costs of environmentally sound recycling. This creates a risk of 'paper compliance,' where credits are traded without genuine material recovery.

Furthermore, the circular economy eco-system is undermined by the export of black mass, which drains valuable feedstock. Without a regulated floor price for EPR certificates and stricter oversight, recyclers face challenges with affordability of advanced technology needed for high-yield recovery.

5.5 EV charging infrastructure: Key takeaways from India

Alongside demand incentives and supply-side measures, the expansion of charging infrastructure has been a cornerstone of India's EV transition. The growth of public charging stations (PCS) has been rapid, increasing from just 451 stations in 2021 to over 29,000[22] by December 2025.

Electricity supply in India is a regulated sector, governed by both central and state authorities. The Ministry of Power first issued comprehensive guidelines for EV charging infrastructure in 2018, including the landmark decision to delicense the operation of public charging stations. This reform opened the sector to a wide range of charge point operators and significantly lowered entry barriers. The Central Electricity Authority subsequently notified technical standards for charging stations, while the Ministry of Power has periodically updated its guidelines, most recently in early 2024. The latest guidance recommends the availability of at least one charging station within every 1 km × 1 km grid in urban areas by 2030. To support domestic manufacturing, phased manufacturing requirements mandate a minimum of 50 per cent domestic value addition in charger sub-systems.

Fiscal support has also played a critical role. Under FAME I, modest funding was allocated for charging infrastructure, but FAME II marked a step change with Rs 1,000 crore earmarked for supporting over 7,500 charging stations, primarily through location-based subsidies for public entities. The PM E-DRIVE scheme further expands this ambition, targeting the deployment of 88,000 fast charging stations across vehicle segments, supported by an outlay of Rs 2,000 crore. In parallel, GST on EV chargers has been reduced from 18 per cent to 5 per cent, and several states have supplemented central support with capital subsidies, concessional electricity tariffs, and time-of-day pricing.

Effective planning also requires an understanding of user charging behaviour across private, semi-public, and public charging contexts. Personal two- and four-wheelers predominantly rely on home charging, prompting amendments to building regulations to mandate charging-ready parking spaces in residential and commercial developments. Semi-public charging, particularly in multi-unit dwellings, is increasingly important as urban housing patterns shift towards higher-density living. Chargers in such settings tend to achieve higher utilization rates and improved commercial viability.

India's charging ecosystem accommodates a wide range of technologies and standards, spanning AC and DC chargers tailored to different vehicle categories. While standards such as CCS-II have emerged as the dominant fast-charging solution for passenger cars, convergence around a common fast-charging standard for light electric vehicles remains limited. Persistent challenges include interoperability gaps, vandalism and theft, and reliability issues along highway corridors.

For Nigeria that is beginning to scale charging infrastructure, India's experience points to several key lessons: extend financial incentives to private charging operators, enforce localization requirements through robust compliance mechanisms, sensitize electricity utilities to EV charging needs, and explore innovative procurement and tendering models, including renewable energy–linked charging systems.

5.6 Next steps

The shift to electric mobility presents a transformative opportunity for Africa to pursue a cleaner, lower-carbon transport pathway. Given the dominance of used vehicle imports and the absence of a strong domestic ICE manufacturing base, EVs offer a chance to leapfrog to cleaner technologies. Policy responses will vary across countries, but early signals are encouraging. Ethiopia has banned the import of ICE vehicles, while several countries—including Togo, Ghana, Benin, Uganda, Tanzania, Rwanda, and Kenya—have introduced tax incentives for EVs. Two-wheelers, three-wheelers, and buses are already driving early adoption, particularly in East Africa.

To scale these early gains, African countries will require dynamic and adaptive policy frameworks encompassing regulations, standards, incentives, and institutional coordination. India's experience demonstrates how policy design and regulatory evolution can shape market outcomes. The lessons outlined in this document are intended to inform and sensitize policymakers, offering real-world insights that can be adapted to local contexts as African nations chart their own electric mobility pathways.

Key priorities include setting ambitious and credible targets, prioritizing public transport electrification, deploying innovative procurement models, strengthening safety and performance standards, building testing and certification capacity, ensuring policy stability, regularly evaluating outcomes, decentralizing implementation where appropriate, promoting interoperability in charging infrastructure, integrating EV planning with urban development, and fostering cross-sectoral coordination across government agencies.

Implications for Nigeria's regulatory pathway

Taken together, global and Indian experience suggest that successful EV transitions depend on sequencing, institutional coordination, performance-linked incentives, and enforcement capacity. For Nigeria, the challenge is not ambition but execution: aligning national intent with sub-national action, embedding quality and safety into incentive design, crowding in finance, and preparing early for battery circularity.

A pragmatic, Nigeria-specific approach—focused on high-impact segments, predictable incentives, coordinated governance, and strong standards—can convert electric mobility from a legislative aspiration into a durable development pathway.

References

1 Nduka Chiejina 2025. *Nigeria remains Africa's largest economy, says World Bank*. The Nation. Accessed at https://thenationonlineng.net/nigeria-remains-africas-largest-economy-says-world-bank-2/

2 Anon 2025. *Automotive sector*. International Trade Administration. Accessed at https://www.trade.gov/country-commercial-guides/nigeria-automotive-sector#:~:text=Limited%20disposable%20income%20due%20to,of%20new%20vehicles%20and%20parts.

3 Ibid

4 Sarah Laniyan 2025. *Senate passes bill to transition Nigeria to electric vehicles for second reading*. Techpoint. Africa. Accessed at https://techpoint.africa/news/senate-passes-ev-transition-bill /

5 Anon 2025. *Importing Cars in 2025: What Nigerian Buyers Need to Know About New Import Duty Laws*. Carzilla Africa. Accessed at https://www.carzillaafrica.com/2025/07/18/importing-cars-in-2025/#:~:text=So%2C%20What's%20New%20in%202025,%2C%20port%20charges%2C%20and%20logistics.

6 National Automotive Design and Development Council; https://naddc.gov.ng/

7 Bugaje, Al-Amin et al. 2022. *Nigeria's electricity vision 30-30-30: Exploring the techno-economic and environmental implications*. Ecowas Sustainable Energy Journal. Accessed at https://www.researchgate.net/publication/366423030_Nigeria's_Electricity_Vision_30-30-30_Exploring_the_Techno-Economic_and_Environmental_Implications#:~:text=Abstract%20and%20Figures,by%20~146%25%20in%202030.

8 Anon (n.d). *Frequently asked questions*. Nigeria Customs Service, Federal Ministry of Finance, Federal Government of Nigeria. Accessed at https://customs.gov.ng/?page_id=9315

9 Grace Ashiru 2025. *Nigerian senate approves bill for electric vehicle transition, paving the way for green mobility*. Tech in Africa. Accessed at https://www.techinafrica.com/nigerian-senate-approves-bill-for-electric-vehicle-transition-paving-the-way-for-green-mobility/

10 Anon (n.d). *Frequently asked questions*. Nigeria Customs Service, Federal Ministry of Finance, Federal Government of Nigeria. Accessed at https://customs.gov.ng/?page_id=9315

11 Thabo Nkosi 2025. Nigeria EV Import Rules 2025: What Buyers and Dealers Must Know. Ev24Africa. Accessed at https://www.ev24.africa/nigeria-ev-import-rules-2025-what-buyers-and-dealers-must-know/#:~:text=Previously%2C%20fully%20built%20cars%20faced%20a%20hefty,15%25%20National%20Automotive%20Council%20(NAC)%20levy%20added.

12 ibid.

13 Anon, 27 October, 2025. *The Standards Organisation of Nigeria (SON) has inaugurated the National Technical Committee on Electric Mobility Standards*. Accessed at official handle of Government of Nigeria https://www.instagram.com/p/DQUObpsiDts/

14 Chibueze Ebii 2021. *Developing the RE Sector Responsibly - Battery Waste Management in Nigeria*. The Heinrich Böll Foundation. Accessed at https://ng.boell.org/en/2021/12/10/developing-renewable-energy-sector-responsibly-establishing-regulatory-framework-battery#:~:text=The%20Federal%20Ministry%20of%20Environment,Producer%20Responsibility%20(EPR)%20model.

15 Anon (n.d). *National Environmental Standards and Regulations Enforcement Agency*. NESREA Website. Accessed at https://nesrea.gov.ng/#:~:text=NESREA%20has%20responsibility%20for%20the,Director%20General%20of%20NESREA%2C%20Dr.

16 Anon 2025. *India EV Report*. EVReporter. Accessed at https://evreporter.com/wp-content/uploads/2025/05/EVreporter-India-EV-Report-FY24-25.pdf

17 Anon 2026. *Indians drive petrol, diesel vehicles; park EV plans after GST cut*. ET Online, Jan 2, 2026. Indians drive petrol, diesel vehicles; park EV plans after GST cut. Economic Times. Accessed at https://economictimes.indiatimes.com/industry/auto/auto-news/indians-drive-petrol-diesel-vehicles-park-ev-plans-after-gst-cut/articleshow/126304556.cms?from=mdr

18 Ajit Dalvi 2025. *Electric 3W industry scales new high in FY2025 but misses 700,000 milestone by 900 units*. Autoicar Professional. Accessed at https://www.autocarpro.in/analysis-sales/electric-3w-industry-scales-new-high-in-fy2025-but-misses-700000-milestone-by-900-units-125743

19 Bhatia, Shubhangi, ETAuto, Apr 9, 2025. India’s EV uptake hits 7.8% in FY25; are we on track to achieve 2030 target?; accessed at https://auto.economictimes.indiatimes.com/news/industry/indias-ev-uptake-hits-7-8-in-fy25-are-we-on-track-to-achieve-2030-target/120092840#:~:text=Table_title:%20India’s%20EV%20uptake%20hits%207.8%25%20in,%7C%20FY25:%200.9%25%20%7C%20FY24:%200.8%25%20%7C

20 Prasad, Akshay et al, May 2023, Arthur D Little. The relevance of EV battery swapping in emerging markets; accessed at https://www.adlittle.com/in-en/insights/viewpoints/relevance-ev-battery-swapping-emerging-markets#:~:text=To%20address%20some%20of%20these,to%20six%20cars%20per%20hour.

21 PIB Delhi; Dec 2025. Electric Vehicle Charging Stations; accessed at https://www.pib.gov.in/PressReleasePage.aspx?PRID=2204635&reg=3&lang=2#:~:text=by%20PIB%20Delhi-,The%20details%20of%2029%2C151%20electric%20vehicle%20charging%20stations%20(EVCS)%20installed,2025.

This report examines Nigeria's emerging regulatory framework for electric mobility and situates it within a broader learning framework for the Global South. It analyses evolving legislation, institutional arrangements, fiscal incentives, and technical standards shaping the country's EV transition, while identifying implementation challenges related to infrastructure, governance, and market readiness.

Drawing comparative insights from India's regulatory experience, the report highlights opportunities for policy learning, industrial development, and regional collaboration. By documenting Nigeria's evolving approach, the report aims to support policymakers and regulators in designing coherent, context-responsive electric mobility strategies across developing economies.

Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Phone: 91-11-40616000 **Fax:** 91-11-29955879
E-mail: cse@cseindia.org **Website:** www.cseindia.org