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5. India's EV Sector–Environment

Around 2.5 million electric vehicles were sold in FY26, a significant increase from FY25, marking India's accelerating EV adoption. However, as India moves away from imported fossil fuels, it is becoming increasingly dependent on imported lithium-ion batteries — with 7,987 MWh imported in 2025 from 14 global manufacturers, a significant share from Chinese manufacturers. Under the ACC Battery PLI scheme, while 40 GWh of capacity has been awarded, only about 1 GWh has been installed, revealing a critical domestic manufacturing gap. EV growth must now be judged beyond sales numbers by three additional metrics – supply chain resilience, strategic autonomy, and long-term sustainability.

1. What are Electric Vehicles?

Definition

1. Operates on electric motor instead of internal-combustion engine generating power by burning fuel-gases
2. Stores electricity in large, rechargeable battery packs plugged into external power source for recharging
3. Possible replacement for current-generation automobiles addressing rising pollution, global warming, depleting natural resources

Types

1. **BEV (Battery Electric Vehicle)** – Fully electric, no combustion engine
2. **PHEV (Plug-in Hybrid Electric Vehicle)** – Electric + combustion engine, external charging
3. **HEV (Hybrid Electric Vehicle)** – Electric + combustion, no external charging

2. India's Domestic Cell Manufacturing

Current Status

1. Domestic cell manufacturing still far below scale needed to alter import dependence meaningfully
2. ACC Battery PLI scheme – 40 GWh capacity awarded but only ~1 GWh installed
3. Passenger EVs sourcing batteries from 14 global manufacturers
4. 7,987 MWh imported in 2025
5. Significant share from Chinese manufacturers
6. Increasing EV sales tightly correlated with increasing imports from China

Strategic Implication

1. India replacing fossil fuel import dependence with battery import dependence
2. Shifting one external vulnerability for another
3. Domestic manufacturing ecosystem requires urgent acceleration

3. Concerns

Dependence on Single Country

1. Battery supply increasingly exposed to single-country (China) ecosystem
2. Shaped by policy, geopolitics, industrial strategy outside India's control
3. **Recent Chinese developments influencing pricing, availability –**
 1. Tighter technology restrictions
 2. Prioritization of domestic demand
 3. Withdrawal of VAT exemptions on battery exports

Geopolitical Situation

1. West Asia conflict compounding pressure through -
 1. Higher raw material costs
 2. Elevated manufacturing expenses in China
 3. Rising transport and risk premiums
2. Multiple simultaneous external shocks threatening supply stability

Impact on Indian Market

1. India's price-sensitive market - Cost increases confining EVs to premium segments
2. National adoption targets placed at risk
3. If OEMs (original equipment manufacturers) forced to pass higher costs to consumers - dampening demand
4. Slower transition threatening climate commitments, energy security goals

4. Government Initiatives

PLI Scheme for Automobile and Auto Component Industry (PLI-Auto, 2021)

1. Boosts domestic manufacturing of Advanced Automotive Technologies (AAT)
2. Key mandate - Companies must ensure **at least 50% Domestic Value Addition (DVA)** to qualify for incentives
3. Encouraging localization of EV components

Scheme for Promotion of Manufacturing of Electric Passenger Cars in India (SPMEPCI, 2024)

1. Draws global automakers to invest in India
2. Approved applicants - Five-year window to import Completely Built-in Units (CBUs) of electric four-wheelers
3. Minimum CIF value - **USD 35,000**
4. Significantly reduced customs duty - **15%**
5. Conditional on commitment to domestic manufacturing

PLI Scheme for Advanced Chemistry Cell (ACC, 2021)

1. Approved for manufacturing ACC in India
2. Budgetary outlay - **₹18,100 crore**
3. Aims to establish competitive domestic manufacturing ecosystem for **50 GWh** of ACC batteries
4. Critical for reducing battery import dependence

Rare Earth Permanent Magnet (REPM) Scheme

1. Develops domestic production of rare-earth permanent magnets used in EV motors
2. Reduces dependence on critical mineral imports
3. Strengthens upstream supply chains for electric mobility
4. Addresses rare earth dominance (China controls ~85% global rare earth processing)

Other Initiatives

1. **FAME (Faster Adoption and Manufacturing of Electric Vehicles)** - Demand-side subsidies for EV adoption
2. **National Electric Mobility Mission Plan (NEMMP)** - Long-term EV adoption roadmap
3. **PM e-DRIVE** - Recent scheme expanding EV charging infrastructure
4. **Battery swapping policy** - Enabling battery-as-a-service models

5. Way Forward

Explore Alternative Battery Chemistries

1. Indian manufacturers should begin type-testing vehicles across emerging chemistries including **sodium-ion batteries**
2. Sodium-ion – Not yet full substitute for lithium-ion across all use cases
3. Could serve as meaningful hedge as domestic production scales
4. Reduces lithium import dependence (India has limited lithium reserves)

Build EV Supply Chain Alliance

1. Structured 'EV supply chain alliance' with trusted partners
2. Spanning minerals, manufacturing, technology, standards
3. Distributing risk across geographies
4. Deepening domestic capability over time
5. Ensuring no single external disruption can stall electrification agenda

Accelerate Critical Mineral Partnerships

1. Bilateral agreements with lithium-rich countries (Australia, Argentina, Chile, Bolivia)
2. India-Australia Critical Minerals Partnership (2022) as model
3. Securing upstream supply chain (lithium, cobalt, nickel, manganese)

Strengthen Domestic Manufacturing

1. Accelerate ACC PLI scheme implementation (1 GWh → 50 GWh target)
2. Attract global battery manufacturers to set up India operations
3. Technology transfer agreements with Japan, South Korea, EU battery makers
4. Build gigafactory ecosystem (Tata, Reliance, Maruti investments)

Promote Circular Economy

1. Battery recycling infrastructure reducing virgin material dependence
2. Extended producer responsibility for battery end-of-life management
3. Second-life battery applications (stationary storage)

6. Conclusion

India's EV sector must transition from measuring success purely through sales numbers to building genuine supply chain resilience and strategic autonomy – reducing single-country battery dependence, accelerating domestic ACC manufacturing, exploring alternative chemistries like sodium-ion, and building trusted multilateral EV supply chain alliances ensuring intelligent, secure electrification.

Source - <https://www.thehindu.com/news/national/the-need-for-strengthening-indias-ev-supply-chains/article71054252.ece>