



From Awareness to **A C T I O N**

Regional Perspectives on
Battery-Electric Trucks

About Smart Freight Centre (SFC)

Smart Freight Centre is an international non-profit organization working on Freight Decarbonization to minimize the climate impact of the global freight and logistics sector. Smart Freight Centre has also undertaken a host of Freight Decarbonization initiatives in India under its India program, working in close collaboration with the India Freight Industry, Policy Offices (national and sub-national), Academia & Research and other ecosystem partners, targeting one of the world's largest freight markets with the urgent mission to address the projected 400% increase in CO₂ emissions by 2047. Smart Freight Centre, with its India program, is deeply engaged with NITI Aayog's e-Fast India program, collaboratively working with various knowledge partners to advance specific aspects of ZET ecosystem development, while also leading on Freight Emissions Guidance Development and Industry adoption in India. Through these strategic partnerships and a collaborative approach, SFC India envisions and works toward a freight and logistics sector that is sustainable, environmentally responsible, and actively engaged in mitigating climate impact, seeking commitments from logistics service providers and shippers to adopt emission reduction strategies for a more sustainable future.

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From Awareness To Action

Regional Perspectives on Battery-Electric Trucks





सत्यमेव जयते



O/o AS (Auto)/5151/2025

Dated: 23.10.2025

Foreword

India stands at a pivotal moment in its journey toward sustainable mobility. The transition to clean transport is not only a national imperative but also a global responsibility. Medium and Heavy-Duty Vehicles (MHDVs), particularly freight trucks, play a critical role in our economy and present a unique opportunity to drive meaningful change in emissions reduction.

In this context, I commend the efforts of Smart Freight Centre India and its partners. Their campaign, Accelerating the Shift: Transition to Zero Emission Trucks, has brought together a wide spectrum of stakeholders across 11 cities, fostering dialogue and collaboration among government bodies, logistics providers, vehicle manufacturers, financiers, and infrastructure developers. The Ministry of Heavy Industries launched the scheme to incentivise e-Trucks under the PM E-DRIVE. This is the first time that the Government of India has introduced dedicated support for heavy electric trucks to help the country's transition to clean and sustainable freight mobility. This scheme is a strategic move towards reducing emissions from heavy-duty vehicles and reaffirms India's commitment to achieving its net-zero emissions target by 2070.

The insights generated through this multi-state engagement offer valuable perspectives on both the challenges and the opportunities in transitioning to Zero Emission Trucks (ZETs). From infrastructure gaps to financing models, the campaign has surfaced actionable recommendations that can inform policy, investment, and innovation.

As we work toward achieving higher electric vehicle penetration by 2030, it is essential that the MHDV sector embraces this transition with strategic intent and collaborative spirit. The adoption of e-trucks can enhance operational efficiency, reduce environmental impact, and position India as a leader in sustainable freight.

I encourage all stakeholders both public and private to view this report not just as a reflection of current realities, but as a roadmap for future progress. Let us move forward with shared purpose, leveraging technology, partnerships, and policy alignment to build a resilient and inclusive zero-emission freight ecosystem.

Together, we can shape a cleaner, more competitive, and climate-resilient future for India.



Dr. Hanif Qureshi



CENTRE OF EXCELLENCE FOR ZERO EMISSION TRUCKING

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Foreword

India's commitment to sustainable and inclusive development is reflected in its ambitious goals for clean mobility and decarbonization of the transport sector. As we move towards achieving 30% electric vehicle penetration by 2030, the freight segment, particularly medium and heavy-duty trucks, presents both a challenge and a transformative opportunity.

It is in this context that I commend Smart Freight Centre India for its exemplary efforts under the e-FAST India initiative, supported by NITI Aayog, in advancing the transition to Zero Emission Trucks (ZETs). The multi-state campaign titled '*Accelerating the Shift: Transition to Zero Emission Trucks*' has successfully engaged a wide spectrum of stakeholders across India's logistics ecosystem, bringing together key stakeholders from over 11 cities, including government departments, logistics service providers, shippers, financiers, OEMs, charge point operators, and industry associations.

This campaign's two-phased approach starting with strategic engagement in metropolitan 'Decision Layer' cities and expanding to regional 'Enablement Layer' hubs has generated rich, region-specific insights. These workshops have not only highlighted the barriers to ZET adoption, such as high vehicle costs and limited infrastructure, but also surfaced practical recommendations for infrastructure investment, financing models, regulatory alignment, and capacity building. In fact, this campaign by SFC nicely complements and supplements the Outreach campaign to the User Layer that CoEZET has been driving to enable ZET awareness, acceptance and adoption.

The report that follows is a reflection of ground-level dynamics of India's freight transition. It captures the voices of stakeholders, the nuances of regional contexts, and the urgency of coordinated action. It offers a roadmap for policymakers, industry leaders, and financial institutions to work together in building a robust and inclusive ZET ecosystem.

As we look ahead, it is imperative that we prioritize strategic vehicle segments, align infrastructure with freight demand, and foster innovation across the value chain. With collective resolve and informed action, India can not only meet its climate goals but also set a global benchmark for sustainable freight.

I once again congratulate SFC India for this important contribution and encourage all stakeholders to use this report as a foundation for collaborative progress.



C. S. Shankar Ram

C S Shankar Ram

Dated: 18th October 2025

Foreword

With immense pride and deep admiration, I extend my heartfelt congratulations to the Smart Freight Centre India team for their visionary leadership and exceptional execution of the Zero-Emission Trucking (ZET) Awareness Campaign, delivered in collaboration with NITI Aayog under the initiative 'Accelerating the Shift: Transition to Zero Emission Trucks'.

This campaign has been nothing short of transformative. Spanning 11 cities and engaging over 700 stakeholders directly and equally more indirectly, it united a diverse coalition of city and state departments, logistics service providers, shippers, financiers, OEMs, charge point operators, and industry associations. Such a multi-sectoral alliance is not only remarkable in scale but essential for building a resilient, future-ready ecosystem for zero-emission freight in India.

The campaign's structured approach anchored in four key stages: identifying strategic hubs, co-creating content with local stakeholders, executing targeted activities, and scaling learnings reflects a commitment to both strategic rigor and inclusive engagement. This model sets a new benchmark for how awareness and action on ZETs can be catalyzed across geographies and sectors.

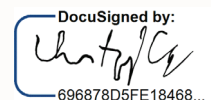
Zero-emission trucking is one of the most powerful levers for transforming India's logistics landscape. It offers a pathway to meet climate and clean air goals while unlocking opportunities for efficiency, resilience, and competitiveness. Through this campaign, one message rang clear: to unlock India's ZET potential, we must overcome systemic barriers such as inadequate corridor charging infrastructure, fragmented regulations, and limited financing models. Yet, India stands poised to lead with innovation through solutions like Battery-as-a-Service, renewable-powered freight charging, and localized manufacturing. These insights are not just regional they are national imperatives.

The momentum is here. The path forward is clear.

At Smart Freight Centre, we remain steadfast in our commitment to this transition. We will continue to convene stakeholders, share knowledge, and drive collective action to ensure India's freight system becomes a backbone of economic prosperity while safeguarding public health, air quality, and our climate future.

Once again, congratulations to the SFC India team for your vision, dedication, and impact. Your work is shaping a cleaner, smarter, and more sustainable freight future for India and for the world.



DocuSigned by:

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Prof. Dr. Ing. Christoph Wolff

CEO, Smart Freight Centre, Amsterdam

Acknowledgements

SFC India extends its sincere and profound gratitude to all coordinating departments, participating institutions, and industry stakeholders across **11 Strategic Urban Centres** (3 metropolitans representing decision centres and 8 regional zones engagement) namely Delhi, Mumbai, Chennai, Hyderabad, Indore, Thiruvananthapuram, Ranchi, Chandigarh, Ahmedabad, Alwar and Mysuru for their invaluable support in successfully convening the regional workshops under NITI Aayog's flagship campaign, **'Accelerating the Shift: Transition to Zero Emission Trucks'**.

These workshops were organized as part of the **e-FAST India initiative**, which seeks to catalyze regional ecosystem preparedness for the adoption of Zero Emission Trucks (ZETs). Given that freight trucks account for approximately 42% of transport-related greenhouse gas emissions, this transition represents not only an environmental imperative but also a strategic lever for industrial innovation and economic transformation.

We are deeply appreciative of the active participation and insightful contributions from all stakeholders, which enabled the creation of a dynamic platform for knowledge exchange and collaborative dialogue. The discussions spanned technological advancements, operational frameworks, and policy enablers for ZETs, while also spotlighting city-level adoption pathways, deployment protocols, and international best practices. These efforts were further aligned with national priorities, including the PM E-Drive scheme.

We gratefully acknowledge the following regional stakeholders for their exemplary engagement, coordination and support:

Delhi

Niti Ayog, Ministry of Heavy Industries, Ministry of Commerce and Industry - DPIIT, SIDBI (Small Industries Development Bank of India), CESL (Convergence Energy Services Limited), IFC, CONCOR, Shakti Sustainable Energy Foundation, TERI, IIM Bangalore, e-FAST knowledge partners, AITWA (All India Transport Welfare Association), Transport Corporation of India, Pepsi Co., Tata Power, IPLT, Safexpress, DP World, Amazon MoEving, Sun Mobility, Maersk India, Ashok Leyland, Greencell Mobility, Power Finance Corporation (PFC), Credable, MRF, Mondelez, ITC, Vaultus Green and Ckers Finance

Mumbai, Maharashtra

Jawaharlal Nehru Port Trust, International Finance Corporation, Indian Banking Association, State Bank of India, Bank of Baroda, Axis Bank, SIDBI, Standard Chartered Bank, Shriram Finance Ltd., Indian Bank, HDFC Bank, Hewlett Foundation, Switch Labs, IIT Mumbai, Ultratech Cement, JSW, Cubenz Power, Rhenus Logistics, Siemens Ltd, Transvolt Mobility, WRI and Sundaram Finance Ltd

Chennai, Tamil Nadu

Tamil Nadu EV Task Force – Govt. Of Tamil Nadu, Facilitating MSME of Tamil Nadu (FaMe-TN), CoEZET-IIT Madras, Ashok Leyland, TCI Group, UNDP, CoEZET, IIT Madras, EVtron, Billion-E Mobility, eLorry, CII Institute of Logistics, CONCOR, Expeditors International, Kalyani Powertrain, Keto Motors, Danfoss, BOSCH, Amazon, EoDB, TN Invest, Safexpress, Nippon Paint, IX Energy, WRI and Charge Zone

Hyderabad, Telangana

Telangana Industries Department, Administrative Staff College of India (ASCI), Telangana Pollution Control Board (PCB), Telangana Regional Transport Office (RTO), Telangana State Power Distribution Company Limited (TGSPDCL), Telangana State Road Transport Corporation (TSRTC), Transmission Corporation of Telangana Limited (TSTRANSCO), Telangana State Police

Indore, Madhya Pradesh

District Collector Office – Indore, Commissionerate of Police Indore, Madhya Pradesh Transport Department, National Automotive Test Tracks (NATRAX), Smart City Indore, Traffic Police Department – Indore, Indore Municipal Corporation

Thiruvananthapuram, Kerala

Electric Vehicle Cell – Kerala State Electricity Board (KSEB), Kerala State Road Transport Corporation (KSRTC), Motor Vehicles Department – Kerala, Kerala Fire and Rescue Services Department, Kerala Police, Industries & Commerce Department of Govt. of Kerala

Ranchi, Jharkhand

Industries Department – Government of Jharkhand, Federation of Jharkhand Chamber of Commerce and Industries (FJCCI), Mining Department – Government of Jharkhand, Transport Department – Government of Jharkhand, Jharkhand Police

Chandigarh

Industries Department – Chandigarh Administration, Finance & Transport Department – Chandigarh Administration, National Highways Authority of India (NHAI) – Chandigarh, Public Works Department (PWD) Engineering Division, Punjab University, Indian Institute of Technology Ropar (IIT Ropar)

Ahmedabad, Gujarat

Gujarat Energy Research and Management Institute (GERMI), Gujarat Mineral Development Corporation (GMDC), Gujarat Power Corporation Limited (GPCL), Indian Institute of Management Ahmedabad (IIM-A), Indian Institute of Technology Gandhinagar (IITGN), Institute of Infrastructure Technology Research and Management (IITRAM), Sardar Vallabhbhai National Institute of Technology Surat (SVNIT)

Alwar, Rajasthan

Regional Transport Office – Alwar, Town and Country Planning Department, Jaipur Vidyut Vitran Nigam Limited (JVVNL), Alwar Municipal Corporation, Rajasthan Police and Traffic Department, District Collector Office – Alwar, Urban Improvement Trust – Alwar

Mysuru, Karnataka

District Collector Office - Mysuru, Regional Transport Office – Mysuru, Chamundeshwari Electricity Supply Company Ltd., Mysuru City Corporation, Mysore Industries Association, Mysuru City Police, Karnataka Goods and Transport Association, Mysuru Lorry Owners Association

We also extend our heartfelt thanks to our esteemed knowledge partners – **Beyond Urban, BODHI, GIZ India, IIM Bangalore, WRI India, RMI India, UC Davis** and **Pmanifold** for sharing critical insights and progress updates with the broader ecosystem.

Furthermore, we acknowledge the valuable support of industry associations such as the All-India Transporters Welfare Association (**AITWA**) and the All-India Motor Transport Congress (**AIMTC**), whose regional members enriched the workshops with their practical perspectives and deep domain expertise.

We gratefully acknowledge the support of the **Centre of Excellence for Zero Emission Trucks (CoE-ZET), IIT Madras**, their technical guidance and domain expertise significantly contributed to the quality and impact of the workshop discussions.

Your collaboration has been instrumental in advancing the national discourse on sustainable freight and accelerating the transition toward zero-emission logistics. We look forward to continued engagement as we collectively advance this vital transition



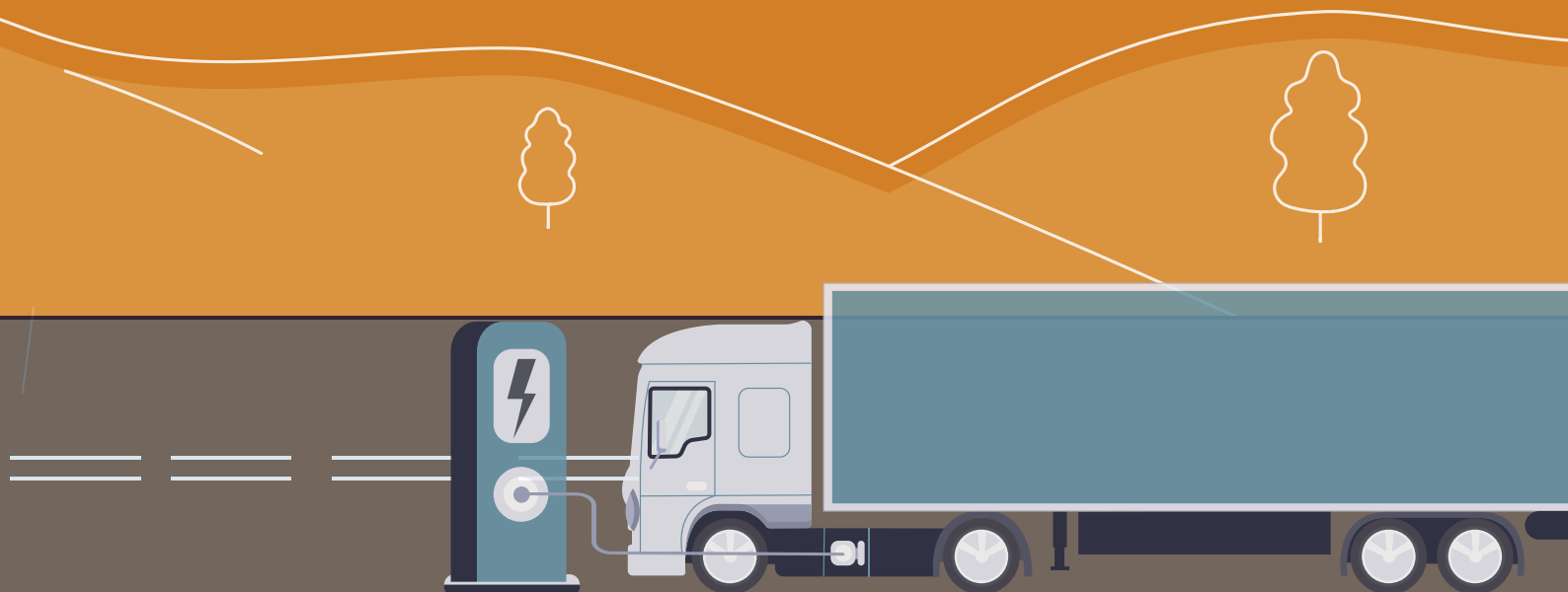
Pramod Rajendran

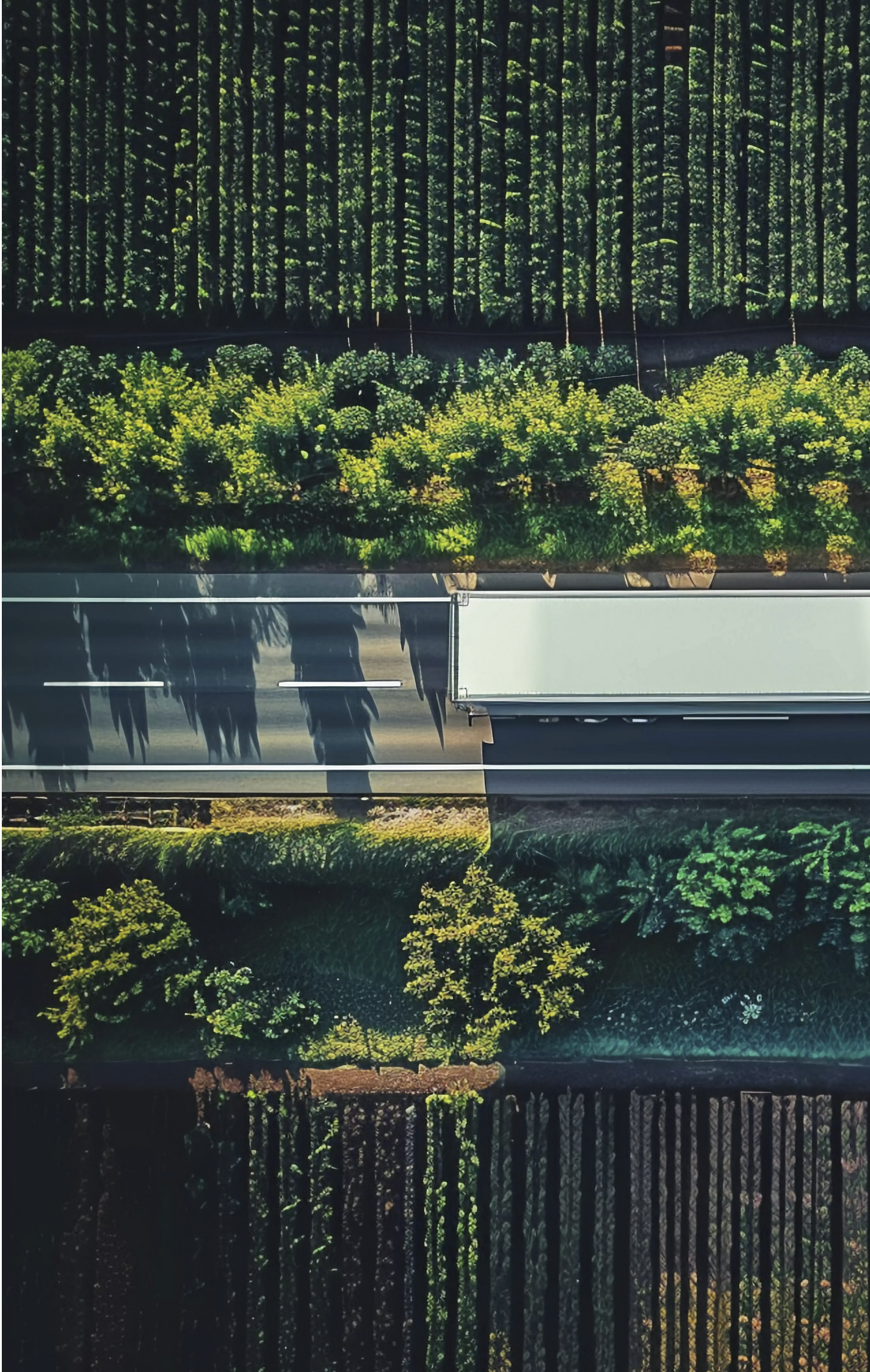
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Smart Freight Centre, India



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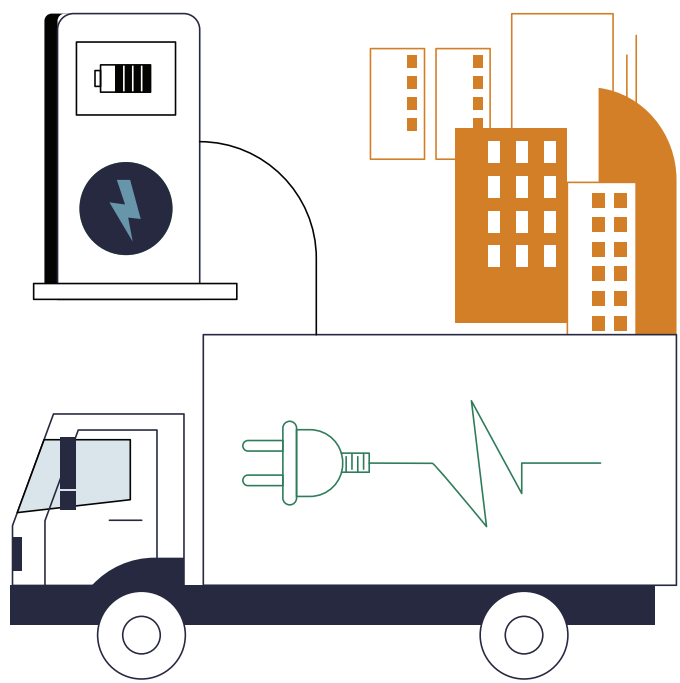


Executive Summary

As part of a pan-Indian effort to accelerate the deployment of Zero-Emission Trucks (ZETs), Smart Freight Centre, India hosted a series of regional workshops that were held under NITI Aayog's e-FAST initiative - 'Accelerating the Shift: Transition to Zero Emission Trucks' witnessed the participation of a remarkably diverse set of **over 700+ stakeholders** across **11 cities**. The engagement spanned more than **35+ city and state-level departments**, reflecting strong institutional involvement. The workshops also brought together over **40+ logistics service providers**, **20+ shippers**, and **10+ financing institutions**, highlighting the broad industry interest in zero-emission freight solutions. Additionally, the presence of **10 associations**, **7 original equipment manufacturers (OEMs)**, and **12 charge point operators (CPOs)** underscored the multi-sectoral collaboration essential for building a robust ecosystem for Zero Emission Trucks in India.

This multi-layered approach brought together voices from **the Decision Layer which included policymakers, financial institutions, and industry leaders**; the **Enablement Layer** included market ecosystem actors, local administrations, fleet operators, drivers, and charge point operators (CPOs). The objective was clear: **to build awareness, assess regional readiness, and co-develop actionable strategies for ZET adoption**. The diversity and depth of participation underscored the strength of collective commitment and the growing momentum for zero-emission freight solutions nationwide.

11 cities
700+ stakeholders
35+ city and state-level departments
40+ logistics service providers,
20+ shippers, and 10+ financing
institutions, participated actively in
the pan-India awareness campaigns
highlighting the broad industry
interest in zero-emission freight
solutions.





Cross-Cutting Regional Insights

This report dives deep into regional insights, highlighting the voices of stakeholders on the ground. While the states and cities varied in industrial profiles, transport infrastructure, and EV policy maturity, five recurring themes emerged across regions:

01

Infrastructure Preparedness and Gaps

Nearly all regions reported inadequate charging infrastructure at major truck hotspots critical for MHDT operations.

Need for State and National level charging infrastructure roadmaps for charging

CPOs flagged underutilization of existing chargers due to lack of freight integration.

Data driven (Toll data, Waybill data) charging infrastructure deployment. Making this data available to the public.

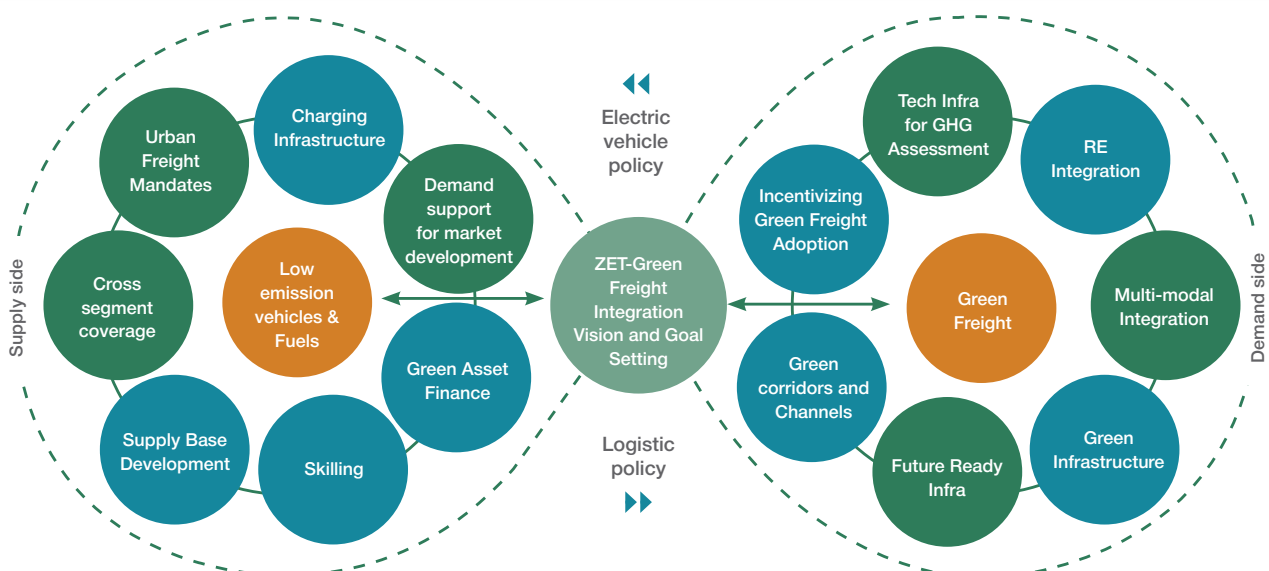


02

Fragmented Policy Landscape

State level EV policies do not address the medium and heavy-duty freight segment specifically N2 & N3 category in the policies. Recently States like Madhya Pradesh and Maharashtra have acknowledged e-truck (N2 & N3 category) within their EV Policies while Jharkhand and Chandigarh consider up to N1 category, but most others lacked MHDT-specific support.

States should consider integrating ZETs into their EV & State Logistics Policies



03

Financing and Business Model Risks

Fleet operators repeatedly cited the high upfront cost of ZETs and the absence of viable financing models available to them.

Establishing risk mitigation instruments like Risk Sharing Facilities (RSFs) is necessary to drive confidence and participation from smaller players, as they reduce financial risks and improve access to affordable capital. Additionally, innovative blended financing models can also provide momentum and free up cashflow for ZET fleet operators

Operation based subsidies such as toll-waivers for ZETs and lease-to-own models were widely requested.



04

Capacity and Awareness Gaps

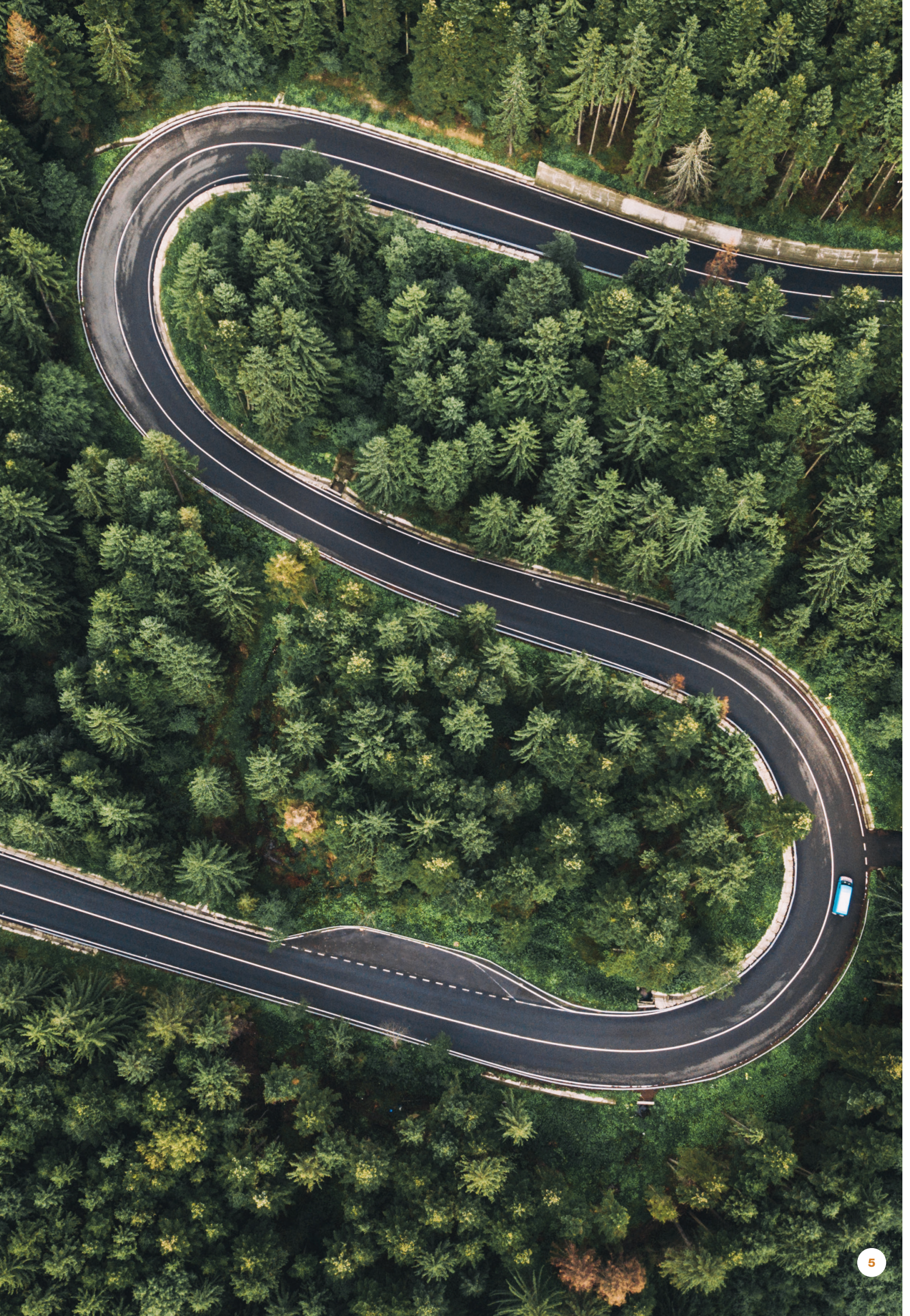
A shared concern was the lack of trained drivers, EV mechanics, and first responders to manage unforeseen situations when handling e-trucks with high battery capacities.

Develop standardized SOPs for e-truck operations, maintenance, and emergency response, and integrate EV-specific training into ITI and skill development programs. Partner with OEMs and Driver Training Centers to certify drivers, mechanics, and first responders for safe handling of high-voltage e-truck systems.

Awareness creation for use-cases where the ZETs have been viable and provide better economic returns were requested to be showcased in detail to explore similar opportunities across regions.

Collaborate with trucking associations and industry partners to showcase detailed case studies of successful ZET deployments.







01

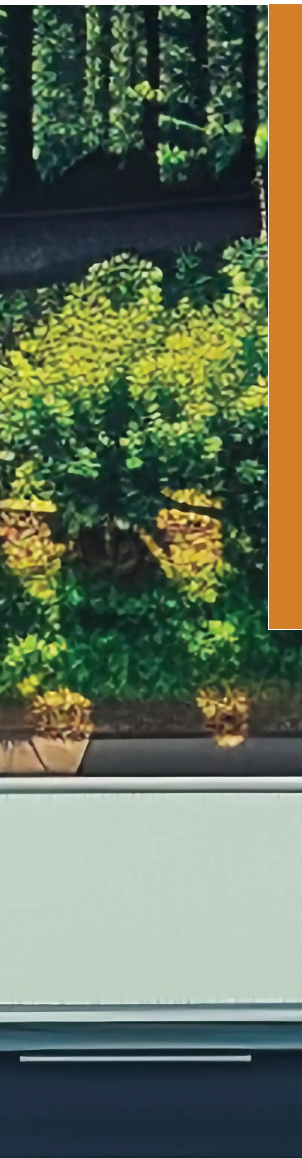
Methodology Process & Goal

1.1 INTRODUCTION

India's freight sector is undergoing rapid expansion, with road transport moving close to **70% of domestic goods and heavy-duty trucks (HDVs) accounting for over 200 Mt of CO2 emissions** annually. Zero-Emission Trucks (ZETs) offer a transformative alternative to diesel freight, combining zero tailpipe emissions with favorable total cost of ownership (TCO) over time. If scaled, **ZET adoption could eliminate over 838 billion liters of diesel consumption and reduce truck-related carbon and pollutant emissions by nearly 46% by 2050.**

Achieving this transition requires early and coordinated ecosystem activation spanning government, logistics, finance, and infrastructure sectors. Awareness building is a foundational step in this process. Smart Freight Centre's ZET awareness campaign was designed to engage both national decision-makers and regional industry stakeholders through a structured, two-phase approach.





1.2 PROGRAM FRAMEWORK

The ZET awareness campaign was structured in two phases, first engaging **3 metro cities** in India under ‘Decision Layer’ centers (Chennai, Delhi, and Mumbai), followed by **8 regional** ‘Enablement Layer’ hubs across Tier I/II/III cities in India. The approach was built on Smart Freight Centre’s ongoing work with India’s logistics ecosystem and applied a regionally grounded framework for stakeholder engagement, knowledge dissemination, and ecosystem activation.

An initial list of 12 Tier II cities was developed across five zones of India, from which 8 final centers were selected. Simultaneously, decision-layer cities Delhi, Chennai, and Mumbai were chosen due to their high concentration of national level policy offices, ISP / Shipper headquarters, industry associations, OEMs and financial institutions.



Identification of Campaign Centers

This stage focused on the preliminary identification of key stakeholders and campaign centers. Cities were shortlisted for the enablement layer using a structured set of criteria:

- ➔ Truck and lorry registration data published by the Ministry of Road Transport and Highways (MoRTH)
- ➔ Maturity of state e-mobility policies and ecosystem development
- ➔ Freight volumes and movement patterns
- ➔ Connectivity to national logistics infrastructure
- ➔ Industrial production and consumption hubs along major freight corridors
- ➔ ZET adoption potential based on current ecosystem signals

Table: Enablement Layer-8 Cities

Zone	State	City
Central India	Madhya Pradesh	Indore
Southern India	Telangana	Hyderabad
	Karnataka	Mysuru
	Kerala	Thiruvananthapuram
Western India	Rajasthan	Alwar
	Gujarat	Ahmedabad
Eastern India	Jharkhand	Ranchi
Northern India	Punjab, Haryana	Chandigarh

Stakeholder mapping was conducted to identify representatives across administrative, industrial, financial, and public sector buyer groups at both the decision and enablement levels.

Table1: Stakeholder Mapping in ZET Implementation

Stakeholder	Role in ZET Implementation
Government & Policymakers	Enact incentives (subsidies, tax waivers), fund public ZET pilots, invest in charging infra, and align state regulations.
OEMs	Develop India-specific ZETs, scale production, and improve range/reliability.
Shippers & Cargo Owners	Aggregate demand, pilot e-trucks in supply chains, co-invest, and set ZET adoption targets.
LSPs & Truck Operators	Deploy pilot fleets, share operational data, train staff, and engage with financiers.
Financial Institutions	Provide ZET financing, risk-sharing tools, and fund pilot projects via green credit products.
Charging & Energy Providers	Set up corridor chargers, upgrade grids, integrate renewables, and offer freight-specific tariffs.
Training & Awareness Orgs.	Deliver training, run outreach, share case studies, and support stakeholder coordination.

Each stakeholder group above contributes uniquely to the ZET rollout, from piloting electric trucks and financing deals to building infrastructure, shaping policy and promoting knowledge collectively driving a supportive ecosystem for truck electrification.



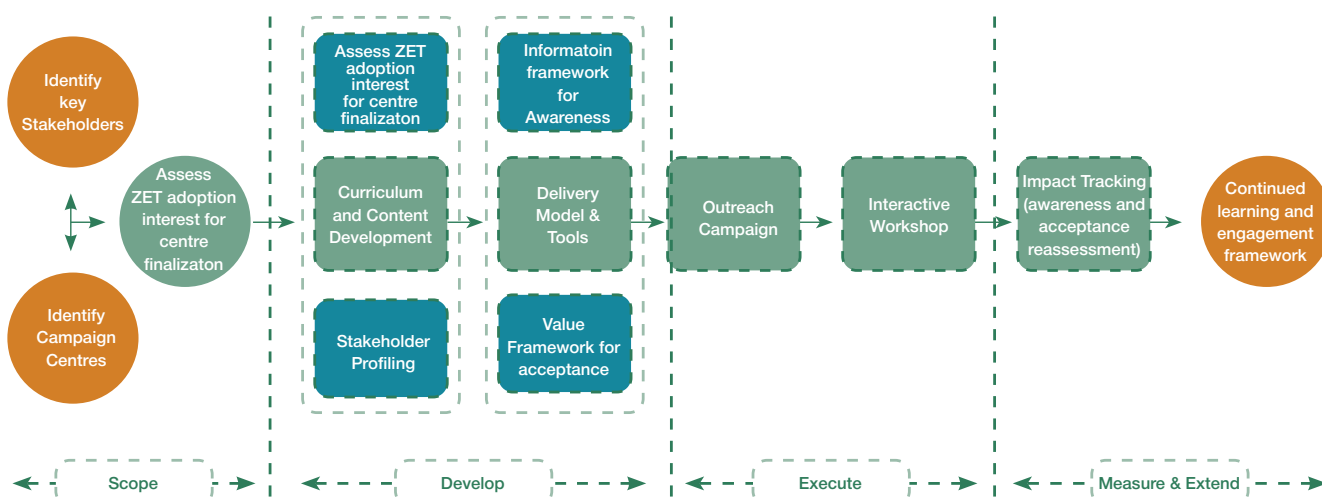
Development of content based on stakeholder interaction

This phase involved direct engagement with stakeholders in the identified cities to:

- ➔ Profile ZET awareness levels
- ➔ Map specific challenges and informational gaps
- ➔ Align expectations and support levels for pilot-scale ZET deployment

Insights from this stage were used to co-develop the campaign structure, including:

- ➔ A modular workshop delivery model tailored to city-specific readiness
- ➔ Customized messaging aligned to stakeholder categories
- ➔ Knowledge products, value frameworks, and business case narratives covering global best practices, national policy updates, charging infrastructure models, and TCO economics



To ensure strategic alignment of messaging with actionable outcomes, stakeholders were further grouped into categories with clear communications and roles for regional ZET acceleration, as presented below:

Table B: Stakeholder Roles in Regional ZET Enablement

S. No.	Stakeholder Category	Key Message Focus	Stakeholder Types	Role in Accelerating ZETs
1	Regional Public Offices	Policy, tech roadmap, SOPs, regulations	State & city officials, RTOs, Police, DISCOMs, Environment Depts, First Responders	Enable ZET pilots, issue incentives, plan chargers, enforce norms, ensure emergency readiness
2	Regional Industry Representative	Business case, tech. updates, operational guidance	Shippers, LSPs, OEMs, Fuel providers, CPOs, eMaaS/CaaS firms	Run pilots, aggregate demand, invest in charging, trial business models
3	Ecosystem Partners	Financing, TCO, global practices	Banks/NBFCs, Real estate, Civil society	Provide EV financing, support leasing, offer land, advocate inclusive policies
4	Institutional Buyers	Adoption opportunities, value case	Municipalities, Public utilities, Local industries	Deploy ZETs in fleets, co-invest in hubs, lead awareness and training



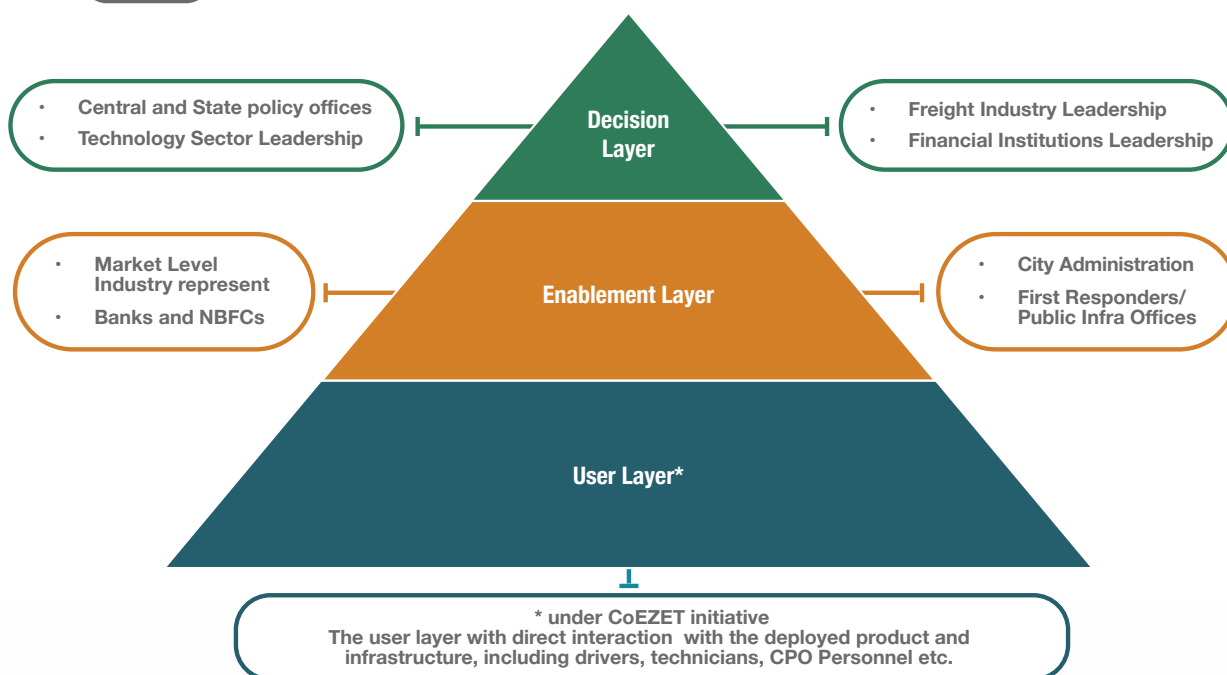
Execution of Campaign

This phase initiated the rollout of the campaign, combining digital outreach, partner engagement, and on-ground workshops.

- ➔ **Decision Layer Workshops:** Held in Chennai, Delhi, and Mumbai, these engaged national-level industry leaders, policy influencers, and financial institutions. Key themes included policy coherence, long-term demand signaling, investment readiness, and national pathways for ZET deployment.
- ➔ **Enablement Layer Workshops:** Conducted across the 8 selected Tier I - Tier II - Tier III cities, these brought together local administrations, logistics operators, infrastructure providers, OEMs, CPOs, financiers, and public institutions. The focus was on regional ecosystem development, readiness assessment, stakeholder capacity building, and outlining next steps for ZET pilots.

Objective

→ Create awareness to catalyse acceptance for ZETs by amplifying the ecosystem developments and establishing the value drivers for ZETs adoption from business, operational and sustainability aspects.



Outreach included:

- Targeted communications via email, calls, and one-on-one meetings
- Workshop proceedings, case studies, and technical notes to extend reach
- Publicity through national and regional press and digital communications



Measure & Extend

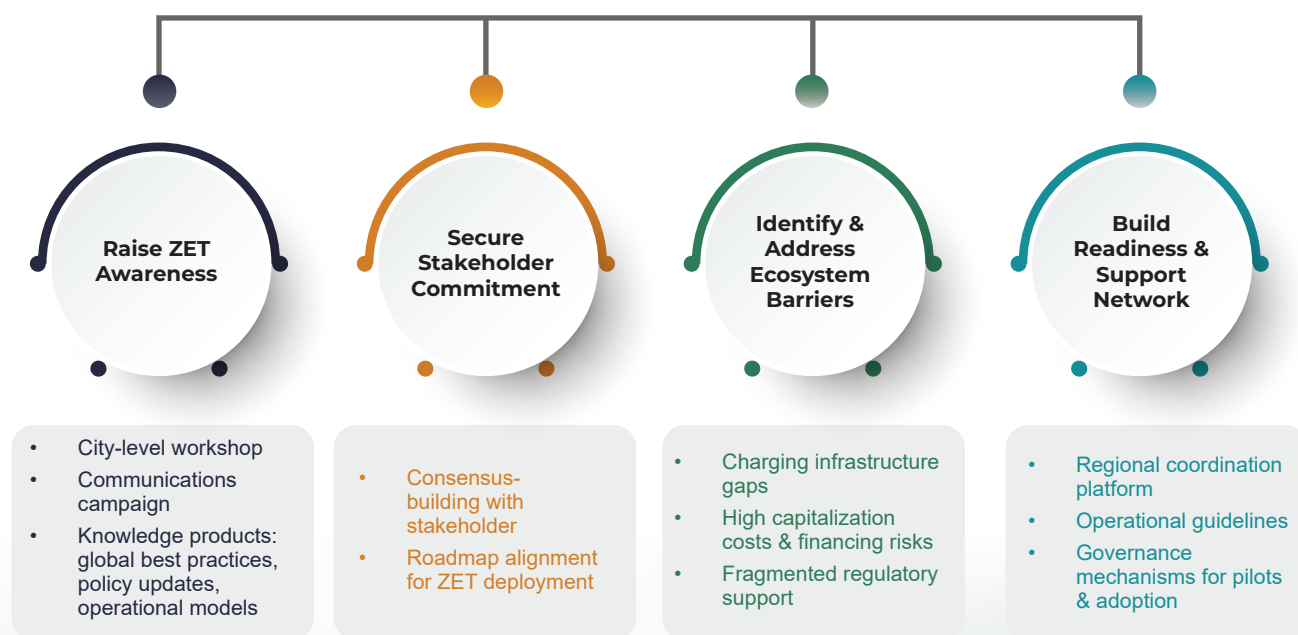
The final stage focused on evaluating the campaign's impact and transitioning toward sustained regional action.

Key activities included:

- Structured assessments of ZET awareness and readiness before and after workshops
- Synthesis reports and readiness indicators by region
- Gap analysis and local ecosystem strengthening plans
- Continued engagement with local administrations to initiate city-level governance or steering groups for ZET programs
- Periodic updates and knowledge sharing to maintain stakeholder alignment and momentum

This structured approach anchored in inclusive planning, adaptive execution, and continuous learning sets the foundation for a replicable, scalable, and regionally responsive pathway to ZET adoption across India.

1.3 CAMPAIGN'S KEY OBJECTIVES



02

Navigating the Decision Layer: Insights & Outcomes

2.1 INPUTS FROM DECISION LAYER

The consultations across 3 metro cities Delhi, Mumbai and Chennai emphasized that while registration and road tax waivers exist, the major challenge for ZET adoption remains the high Capex—almost double of ICE trucks, making access to financing crucial while looking forward to policy interventions which support uptake.





2.2 FINANCE

The transition to Zero-Emission Trucks (ZETs) requires more than just technological readiness; it hinges on the development of sustainable and innovative financing solutions. Traditional lending models are often constrained by high upfront costs, uncertainties around residual value, and total cost of ownership (TCO) risks, which impact the confidence of both lenders and fleet operators. In this context, new business models, leasing mechanisms, and blended finance approaches are emerging as critical enablers to unlock capital, reduce risk, and accelerate large-scale deployment of electric trucks. The following points highlight the key financing challenges and evolving solutions shaping the ZET financing landscape.

- ➔ **High upfront cost, residual value, and TCO concerns** affect business viability, while deployment depends upon shipper & LSPs long-term contracts to build lender confidence.
- ➔ **Logistic companies are considering a mix of leasing and direct loans for adopting electric trucks.** This mix promotes aggregation and economies of scale, which can help solve specific challenges related to cashflows of fleet operators and subsequently improve ZET viability.
- ➔ **Support for leasing companies is crucial** as they enable longer tenures for loans, which are necessary for the viability of truck operations.
- ➔ **Small businesses with distribution reach are setting up new leasing platforms,** indicating a trend towards more diverse financing options. The market is not expected to be dominated by a single player, suggesting a competitive and diverse market environment.
- ➔ **Innovative Financing models like blended finance utilising philanthropic and climate funds can be used to attract private investment.** This approach helps de-risk ZET projects, making them more attractive to lenders by offering protection against capital loss.
- ➔ **Business models like battery-as-a-service (BaaS) and truck leasing can shift costs from a high upfront capital expense** to a more manageable operational expense, making ZET adoption more viable.

2.3 POLICY

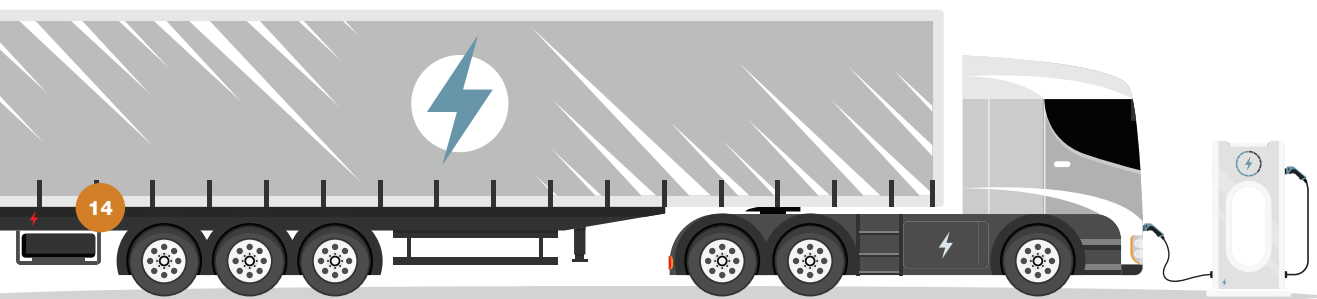
Advancing Zero-Emission Truck (ZET) deployment in India requires a supportive ecosystem that goes beyond vehicle technology. Critical issues such as power availability, charging infrastructure, and regulatory frameworks must be addressed through coordinated policies and investments. Equally important are financial mechanisms and industry participation that can de-risk adoption and build market confidence. The following points highlight the essential enablers and interventions needed to accelerate ZET readiness nationwide.

- Upstream power availability on highways was highlighted as a nationwide issue for setting up charging stations, underscoring the **need for a comprehensive government energy and investment plan**, especially for green corridors.
- **Fast, reliable charging infrastructure** that is practical for daily use must be supported by policies that encourage its development and widespread implementation across key corridors.
- **Regulatory decisions**, like implementing a Low-Emission Zone, can also be a powerful tool. These zones restrict polluting vehicles, thereby directly increasing demand for ZETs and incentivizing the transition.
- **Policy mandates, OEM participation in pilots, blended finance, and insurance support** were identified as key enablers.

2.4 OPERATIONS

Scaling up Zero-Emission Trucks (ZETs) in India calls for a phased approach that balances demonstration, infrastructure readiness, and workforce capacity. Early pilots and demonstration fleets are critical to building market confidence, while robust supply chain strategies can ensure consistent availability of vehicles and components. Operational realities also shape deployment pathways; closed-loop movements are currently more feasible than long-haul intercity operations, given the limitations of battery capacity and truck models. At the same time, collaboration with Charging Point Operators (CPOs) and investment in specialized skill development for drivers, technicians, and support staff will be essential to enable reliable operations and long-term industry growth. The following points outline the key operational and ecosystem factors influencing ZET adoption.

- It was noted that **demonstration fleets are essential for building confidence**, and ZETs must remain actively utilized as idle time undermines economics.
- Chennai workshop highlighted the **need for robust strategies on the manufacturing supply chain**. This will help scale up ZET trucks manufacturing while boosting OEMs confidence to ensure constant product supply.
- Currently closed loop movements of ZETs are more feasible than intercity long-haul operations due to the limitations of existing truck models and battery capacities. The **shorter distances and frequent charging opportunities in specific closed loop settings especially with heavy industries (Mining, Construction, Cement, Steel etc.) and port drayage make e-trucks ideal for freight movement**, while long-haul operations remain more challenging. Battery swapping for ZETs was suggested as game changer to cater for long-haul operations on heavy traffic corridors.
- For successful intercity ZET deployments, collaboration with Charging Point Operators (CPOs) along key routes is key. **Strategic partnerships with CPOs** will ensure that charging stations are available at strategic and convenient locations for ZET operators, and higher utilization rates will help bring down costs for operators.
- The ZET industry will require specialized skills in areas such as driving, service and repair, and emergency response to manage the unique demands of electric trucks. **Developing training programs for technicians, drivers, and support staff will be crucial** in ensuring the smooth integration of ZETs into existing fleets and the broader logistics ecosystem.



2.5 TECHNOLOGY

The future of Zero-Emission Truck (ZET) adoption will be shaped largely by advances in battery technology and the ability of manufacturers to scale product availability. Breakthroughs in charging speed, range, energy density, and battery management systems will directly determine the performance, reliability, and cost-competitiveness of e-trucks against conventional diesel vehicles. At the same time, robust supply chain strategies and clear OEM roadmaps are critical to instill confidence among fleet operators and enable long-term planning for deployment. Standardization of battery technologies and cost reductions achieved through economies of scale will further lower the total cost of ownership, making ZETs a more attractive option in cost-sensitive markets. The following points outline the key technological and supply-side enablers that will drive the transformation of the ZET ecosystem.

- ➔ **Battery technology innovation, reducing charging time, improving range and enabling standardized swapping** will be transformational changes which will encourage ZET adoption.
- ➔ The limited development and availability of e-truck models from Original Equipment Manufacturers (OEMs) make long-term planning for e-truck deployment challenging. Many OEMs are yet to release comprehensive product roadmaps, which restricts fleet operators from planning widespread ZET deployment. **A clear roadmap is essential for building confidence in technology** and aligning resources for mass deployment.
- ➔ The energy density and **power density of electric truck batteries are expected to improve as technology evolves**, which should address many current performance limitations. As battery technology advances, improvements in energy storage and discharge capabilities will extend the range, reduce charging times, and enhance the overall performance of e-trucks, making them more competitive with ICE vehicles.
- ➔ **Enhanced Battery Management Systems (BMS) with more efficient cooling mechanisms will be crucial** for e-truck operations in the hot and humid climate of India. To maintain battery health and longevity in harsh conditions, especially in regions with extreme temperatures, BMS with advanced cooling solutions will play a key role in ensuring reliability and performance.
- ➔ As battery technology advances and economies of scale are achieved, **reductions in battery costs will significantly accelerate the adoption of ZETs** reducing the total cost of ownership and making them a more attractive option for fleet operators.
- ➔ The implementation of interoperable standards for batteries, including communication protocols, will benefit the entire ecosystem from supply chains to consumers and financiers. **Standardized battery technology and form factor will promote scalability, reduce costs, and simplify logistics**, allowing for easier battery utilization and more flexible financing options.
- ➔ **Robust supply chain strategies will be critical to scaling up the production and deployment of ZET trucks**, providing OEMs with the confidence to maintain a steady product supply. Ensuring the availability of critical components such as batteries, motors, and software will alleviate bottlenecks, allowing manufacturers to meet growing demand and reduce lead times.
- ➔ To succeed in cost-sensitive markets, **ZET products must be designed to address both affordability and operational cost-efficiency**. Offering competitively priced ZETs with low maintenance and operational costs will drive adoption, especially among smaller fleet operators where profitability is the top priority.

The journey toward Zero Emission Truck (ZET) adoption in India is complex but promising. Insights from key metro cities/ decision layer consultations reveal that while policy support and infrastructure development are essential, the real transformation hinges on innovative financing, operational adaptability, and technological evolution. As stakeholders from logistics service providers to OEMs and policymakers align their efforts, the path to sustainable freight becomes clearer. With collaborative strategies, robust supply chains, and inclusive business models, ZETs can redefine India's logistics landscape. The decision-layer workshops underscore that the transition is not just about vehicles, but about building an ecosystem ready to embrace a cleaner, more resilient future.



Thiru Srinivasan,
Senior Advisor, FaMe Tamil Nadu

Shared the roadmap to achieving net zero emissions by 2070, highlighting the crucial role of electric trucks in reducing our carbon footprint.



Karthick Athmanathan,
Initiative Director at eLorry

Emphasized the importance of prioritizing impactful and feasible solutions for scaling up electric trucks in India's freight sector



Niteen Borwankar,
**Chief Manager, Jawaharlal
Nehru Port Trust**

Demonstration fleets are crucial for building market confidence by demonstrating the viability of ZET across various parameters, including business and operational.



Ms. Neha Nagpal Grover,
Operations Officer, IFC

The deployment of E-trucks depends heavily on the availability and feasibility of longer duration contracts since the initial cost is higher. Longer shipper-LSP service boosts financial institutions' confidence.



Sudhendu J Sinha,
Advisor, Niti Ayog

Approximately four million trucks currently running on the roads of India, are responsible for spewing out 80% of greenhouse gas emissions from road transport, and thereby emphasized on the urgency of addressing greenhouse gas emissions and adoption of ZETs



Dr R K Singh,
CGM, Green Climate Finance, SIDBI

SIDBI operates a risk-sharing facility for sectors with high perceived risks, such as the energy service company (ESCO) market. The facility provides guarantees to lenders for projects that have been technically appraised, offering them comfort even if the project fails. Similar facility for ZETs should be in place.





03

Regional Chapters

This chapter presents insights from a series of regional engagements conducted across eight selected Tier I, Tier II, and Tier III cities. These sessions convened key stakeholders, including local administrations, logistics operators, infrastructure providers, original equipment manufacturers (OEMs), charge point operators (CPOs), financial institutions, and public agencies. The discussions centered on fostering regional ecosystem development, assessing readiness, building stakeholder capacity, and defining actionable next steps for Zero-Emission Transport (ZET) pilot implementation.



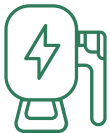


3.1 HYDERABAD

Telangana Mobility Valley initiative and 2047 net-zero goals position the state as a frontrunner for ZET adoption. The state's advanced EV policy prioritizes manufacturing, skill development, and coordinated action across agencies. Existing progress in passenger EVs provides a foundation, but freight-specific infrastructure is still in its infancy.



Policy & Incentives: Development of an “OEM-to-Operator” credit line in collaboration with major financial institutions and OEMs within the Telangana Mobility Valley. This would provide preferential financing rates for ZET purchases when sourced from local manufacturers. This approach would incentivize local manufacturing and channel investment into the state's EV ecosystem, addressing both supply and financing challenges simultaneously.



Infrastructure: Mandate the establishment of shared charging depots at key logistics hubs and industrial clusters like Medchal, Shamshabad, and Patancheru, which have high truck density and predictable operational patterns.

“By leveraging the Telangana Mobility Valley's strengths in manufacturing, innovation, and skill development, we aim to make the state a launchpad for zero-emission freight. Scaling electric trucks is not just an environmental goal it's an economic opportunity to build a future-ready logistics ecosystem.”

**Shri Gopalkrishnan VC, Director
Automotive, Government of
Telangana**



“Our vision for Telangana is clear. We aim for net-zero emissions by embracing electric mobility, particularly in the trucking sector.”

**Shri Jayesh Ranjan,
Principal Secretary
of Industries &
Commerce**



Highlights:

- Telangana's EV policy offers strong incentives, targeting ₹5000 crore in investments for the manufacturing sector.
- Additionally, 550 acres of land have been allocated for vehicle design and prototyping, leveraging digital tools for innovation.
- The government has identified 600 locations for charging stations in Hyderabad, with 450 covered statewide. The land is being provided to CPOs for industrial charging setups.
- State governments can set an example by electrifying garbage collection vehicles, as their low mileage (under 100 km per day) makes them ideal for early adoption.

3.2 INDORE

As Madhya Pradesh's commercial capital, Indore faces daily entry of over 12,000 trucks, creating severe congestion on narrow urban roads. Despite a strong municipal focus on cleanliness and smart city initiatives, freight electrification faces policy and regulatory bottlenecks.



Policy & Incentives: Implementation of a **“Green Urban Freight Mandate”** for last-mile logistics within the city's core. This would require all new commercial fleet registrations for urban deliveries to be ZETs after a specified date. This mandate would create a predictable demand signal and leverage the city's existing strengths in sustainability.



Infrastructure: Instead of spreading charging stations thinly, the city should focus on establishing Urban Consolidation Centers (UCCs) on its periphery. These hubs would serve as central points for unloading goods from large trucks and reloading them onto smaller ZETs for last-mile delivery, thereby reducing congestion and emissions within the city center, a key problem area for Indore.

“We look forward to support in policy, resources, and economics aspects to achieve the goal of lower carbon emissions and set an example for the nation to follow”

Shri Gaurav Benal
Additional Collector,
Indore District, MP



Highlights:

- ➔ Utilize Production Linked Incentives (PLI) to promote local manufacturing of batteries and electric trucks, reducing import dependence and supporting a sustainable domestic EV ecosystem.
- ➔ Implementing a reserve charge option in electric trucks could enable stranded vehicles to be moved from high-traffic areas during breakdowns, reducing congestion and inconvenience to the public
- ➔ Indore administration emphasized that specialized training for first responders to manage emergencies involving electric vehicles will be a crucial step for ensuring rapid and safe responses.

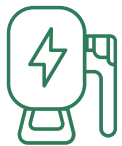
3.3 THIRUVANANTHAPURAM

Kerala combines strong institutional capacity with proactive EV adoption measures, anchored by the EV Accelerator Cell and active public-private partnerships. Kerala's logistics sector is shaped by a fragmented trucking market dominated by small fleet operators, and the state is targeting net-zero emissions by 2050.

Thiruvananthapuram, with its new Vizhinjam International Seaport, is set to become a major transshipment hub. The state's challenge is to align its strong institutional support for EVs with the needs of a fragmented trucking market.



Policy & Incentives: Creation of a closed loop operation, “Vizhinjam Port-to-City” ZET Incentive. This could offer a combination of subsidies and financing support for ZETs used for cargo movement between the port and urban distribution centers. This incentive would be a strategic effort to decarbonize port logistics, which is a key priority for a modern, green port.



Infrastructure: The city should leverage its new port infrastructure by establishing a centralized megawatt-scale charging depot within the port's premises. This depot would serve as a crucial hub for freight vehicles, ensuring that trucks can be recharged during loading and unloading, thereby minimizing vehicle dwell time.

“By leveraging innovative solutions, we have embraced technology and remain dedicated to integrating it into our trucking system to minimize carbon emissions within the logistics sector”

Shri. Biju Prabhakar,
Chairman & Managing Director
CMD-KSEBL



Highlights:

- ➔ The state has 63 operational charging stations (predominantly CCS2), with plans for app-less access and hybrid solar-powered stations with storage coming online this year. Suggested adoption of CCS2 combined charging standards due to its widespread support and compatibility, promoting faster and more efficient EV charging.
- ➔ Establish dedicated EV Accelerator Cells in each state following Kerala's example to monitor growth, identify gaps, train personnel, and drive progress toward net-zero emissions by 2050.
- ➔ Financial incentives support infrastructure rollout, including up to 25% cost coverage for chargers in hotels/ public spaces and ₹20,000/kW subsidies for solar-powered units (capped at ₹10 lakh).

3.4 RANCHI

Jharkhand's economy is heavily mining- and mineral-driven, with significant freight flows in cement, coal, and forest products (timber, bamboo, lac). The state's 2022 EV Policy aims to make Jharkhand a hub for EV manufacturing and adoption, with dedicated incentives for commercial fleets, industrial land rebates, and a strong push for battery manufacturing using local mineral resources.



Infrastructure - ZET Corridor: A unique recommendation for Ranchi is to create closed loop operations in mines, “Mine-to-Washery” ZET incentives. This would involve providing subsidies and tax exemptions specifically for ZETs used on the fixed, mid-distance routes between mines and mineral processing plants. This use-case offers controlled conditions and a predictable operational environment, making it a low-risk, high-impact area for early adoption.



Policy & Incentives: The state's EV policy provides significant financial incentives for N1 category commercial fleets. It is important to specifically focus on the trucking segment to ensure that dedicated incentives and infrastructure are provided for N2 category (MGVs) and N3 category (HGVs).

“Jharkhand is driving the future of sustainable transportation-empowering EV adoption, boosting R&D, and harnessing its rich mineral resources for a greener tomorrow”

Shri Sushant Gaurav,
IAS Director, Dept. of industries,
Govt. of Jharkhand:



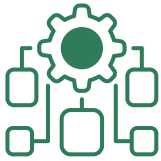
Highlights:

The workshop identified ZET opportunities in three mining-related segments:

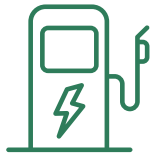
- ➔ in-mine tippers/dumpers (2) mine-to-washery mid-distance hauls, and (3) interstate long-haul transport.
- ➔ Ensuring skill development and awareness programs adapt to the new technology and address the needs of the tribal population, particularly in land allocation for infrastructure, to ensure an equitable transition.

3.5 CHANDIGARH

Positioned at a key junction between Delhi, Punjab, and Himachal Pradesh, Chandigarh is a strategic freight hub. As a key strategic freight hub, Chandigarh has a strong foundation for clean mobility. The city's existing EV deployment is focused on light-duty vehicles, with heavy-duty charging capacity still limited. Coordination between transport, infrastructure, and DISCOMs is evolving but requires strengthening.



Policy & Governance: The city should establish a **Unified Mobility Authority** to act as a single-point contact for all EV and ZET-related approvals, from power connections to land permits. This would directly address the inter-agency coordination related bottlenecks and streamline the rollout of high-capacity charging infrastructure.



Infrastructure: There should be a partnership with public entities like the Chandigarh Transport Undertaking (CTU) to create **shared charging depots** that can serve both public e-buses and private e-trucks. The CTU's existing depots and workshops could be upgraded with high-power chargers, a model that ensures high utilization and operational synergy.

“Sustainable logistics isn’t just about eco-friendly transportation; it’s about rethinking the entire supply chain to reduce waste, conserve resources, and promote a healthier planet. By embracing sustainable transportation solutions, we can deliver value to customers while minimizing costs and environmental impact.”

Shri Diprava Lakra,
IAS, Secretary, Transport Department, Chandigarh
Administration



Highlights:

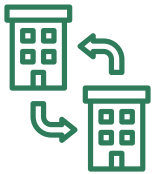
- ➔ Electrifying its high-density freight movements using a hub-and-spoke model, which is ideal for predictable, short-to-medium-haul trips serviced by depot-based charging.
- ➔ Developing software applications and technologies plays a crucial role in the operation and management of ZETs, supporting battery optimization, route planning, smarter energy management, predictive maintenance, and overall efficiency of electric trucks.

3.6 AHMEDABAD

Gujarat has a strong industrial and EV manufacturing base, progressive EV policy, and well-developed freight corridors linking to Kandla-Deendayal Port. High freight volumes in cement, steel, chemicals, and textiles make it a prime candidate for ZET pilots, particularly in fixed-loop operations. However, EV policy coverage for heavy duty vehicle is still not addressed.



Policy & Incentives: A unique recommendation for Ahmedabad is to create “**e-Freight Corridors**” that are prioritized for ZETs, particularly for closed loop routes connecting industrial clusters to the Western Dedicated Freight Corridor (WDFC) and the port. This policy could include specific incentives for cargo owners who commit a certain percentage of their freight to be transported by ZETs on these designated corridors. This model would directly align ZET adoption with a major national infrastructure project.



Business Models: Encourage a data-driven approach by collaborating with the Ahmedabad Operational Control Centre of the WDFC and local logistics platforms. This collaboration can generate valuable operational data on freight patterns, which can be used to inform the design of optimal ZET fleet deployment and charging infrastructure placement.

“We are creating a mine-to-magnet ecosystem to secure rare earths and build domestic EV supply chains.”

Shri Dhananjay Sharma,
Dy. General Manager, Rare Earths
Elements Project, GMDC, (A Govt. of Gujarat
Enterprise)



Highlights:

- ➔ Business model innovations such as Battery-as-a-Service (BaaS), second-life battery use, and local renewable integration emphasize ways to lower upfront costs and reduce operational risks for ZET deployment.
- ➔ Fixed-loop operations in strategic industrial clusters like cement and chemical corridors are ideal for early ZET adoption due to controlled routes, predictable loads, and dedicated charging, addressing range and cost concerns.

3.7 ALWAR

Alwar's industrial zones within the **Delhi-Mumbai Industrial Corridor (DMIC)**, such as the Khushkhhera-Bhiwadi-Neemrana Industrial Area, are key to its economy. The city's primary challenge is de-risking the transition for small, fragmented fleet operators who are highly cost-sensitive.



Policy & Incentives: A unique recommendation is to establish a **“ZET Scrappage-and-Lease Program”**. This program could combine the PM E-DRIVE scheme's scrappage incentive with a subsidized leasing model. Instead of small operators bearing the high upfront cost of a new ZET, they could scrap an old diesel truck, receive a grant, and then lease a new ZET at a reduced monthly rate. This directly addresses the two main barriers for small operators: high capital cost and residual value risk.



Infrastructure: The city should implement a tiered tariff system that provides the lowest rates for overnight and off-peak charging. This would enable operators to charge their vehicles during periods of low demand, further reducing their operational costs.

“With continued support and focused groundwork, we can accelerate ZET adoption and set a strong example for states to follow. This is not just a timely conversation - it's a necessary one.”

Shri Satish Kumar,
Regional Transport Officer, Alwar



Highlights:

- ➔ Fleet owners strongly recommended excluding e-truck/ ZETs from vehicle-life regulatory limitations, emphasizing that with consistent use, only battery replacement should be needed. Allowing long-term vehicle usage without reinvestment in new trucks.
- ➔ Affordability and operational efficiency must be at the core of ZET product design, ensuring competitively priced vehicles with low maintenance and running costs to encourage adoption, particularly among smaller fleet operators where profitability is the top priority.

3.8 MYSURU

Mysuru's logistical profile is defined by its new Multi-Modal Logistics Park (MMLP) at Kadakola and its role as a key hub for interstate freight to neighbouring states. The city needs to capitalize on this infrastructure to create a captive environment for ZET adoption.



Policy & Incentives: A unique recommendation for Mysuru is to leverage the MMLP as a focal point for ZET policy. The city should create a **“Green Freight Zone”** around the Kadakola MMLP where ZETs are granted preferential treatment, including a temporary waiver of entry fees and streamlined single-window clearances. This would create a high-visibility, high-impact pilot area that demonstrates the viability of ZETs in a controlled environment and encourages private sector investment.



Infrastructure: The primary infrastructure focus should be on building a captive charging network within the MMLP itself. This directly addresses range anxiety for freight operators using the facility and ensures high utilization of charging assets, making them more attractive for private charging operators to invest in.

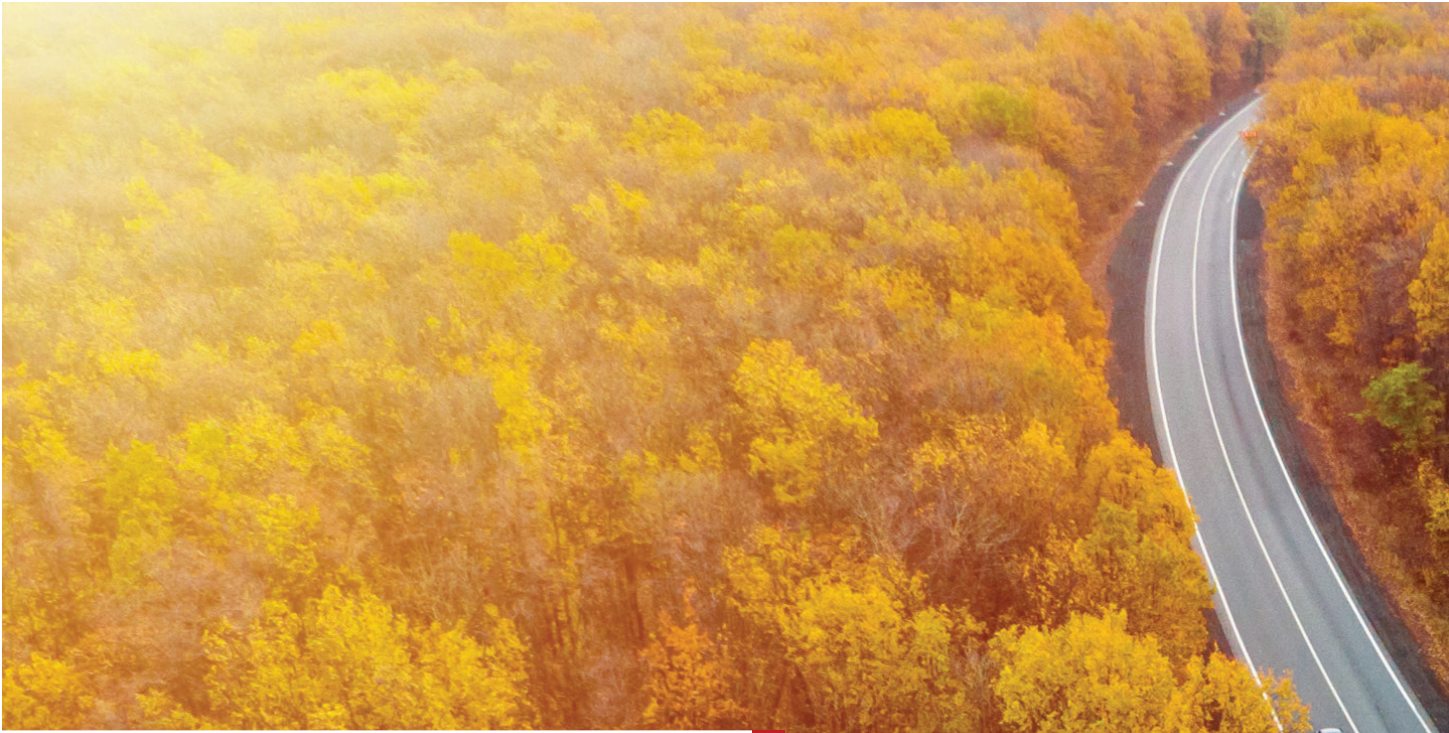
“Decarbonizing freight is vital for India’s Net Zero 2070 goal, with the PM E-Drive scheme offering up to 9.6 lakh incentives and scrappage benefits for medium and heavy trucks. As a logistics hub, Mysuru can spearhead Karnataka’s EV transition.”

Shri Vasant Ishwar Chavan,
Joint Commissioner for Transport, Mysuru



Highlights:

- ➔ Karnataka state’s existing road tax and fee exemptions for EVs are a good start. The city indicated a push for further regulatory incentives such as toll waivers along high traffic corridors and property tax rebates to attract private investment in EV charging hubs.
- ➔ Establishment of dedicated training centers for EV operations is essential to address the driver shortage. Alongside this, awareness programs for single operators and small businesses are needed to build driver readiness and public awareness.



04

Annexure

STAKEHOLDER MANDATES FOR ACCELERATING ZET ADOPTION

Across all workshops, stakeholder expectations aligned on recurring themes anchored in risk reduction, ecosystem readiness, and clearer economic pathways for Zero Emission Trucks (ZETs). While each actor has a unique role, the convergence of their needs reveals where interventions are most urgently needed.



1. Original Equipment Manufacturers (OEMs)

OEMs consistently highlighted the need for **stable, long-term demand visibility** and **predictable policy frameworks** to invest in electric truck manufacturing.

- ➔ **Phased Manufacturing Support:** Many OEMs are preparing for **localized production of critical EV components**, leveraging schemes like PM E-DRIVE's phased manufacturing incentives.
- ➔ **Battery & Warranty Innovation:** OEMs committed to enhancing battery efficiency and offering longer warranties aiming for 5 years / 500,000 km coverage, in line with PM E-DRIVE targets.
- ➔ **Demand Aggregation Call:** To justify plant expansion, OEMs urged state and central governments to aggregate demand via **bulk procurement programs or freight electrification mandates**.
- ➔ OEMs expect government support in the form of clear, long-term national targets for carbon neutrality to guide their investments. They also expect demand incentives, similar to schemes like FAME I and II, to bridge the price gap between ZETs and diesel trucks.
- ➔ OEMs need a **stable demand signal** from fleet operators to **justify large-scale production** and invest in new models.

Case Insight – OEM Session in Indore: An OEM showcased a 12T e-truck model optimized for city-to-hub runs, noting that their expansion into MHDТ depends on clearer signals from large shippers and PSU-backed pilot demand.



2. Shippers and Cargo Owners

Large cargo owners and manufacturers (e.g., FMCG, e-commerce, auto component suppliers) expressed **openness to piloting ZETs** if government and LSP partners could help absorb transition risks.

- ➔ **Performance Assurance:** Shippers and cargo owners require assurance that ZETs can meet their logistical demands, including a reliable range for defined freight corridors and the ability to handle heavy cargo loads without compromising on-time delivery.
- ➔ **Performance-Linked Subsidies:** Shippers and cargo owners expect ZETs to become a viable and cost-competitive alternative to diesel trucks, with a clear incentive framework to make the transition financially sound. And rather than one-time upfront subsidies, many shippers suggested toll-waivers which provide respite to their operational expenditures and benefits are maximum when the asset is sweat the most.
- ➔ **Shared Risk Mechanisms:** Several advocated for **tripartite models** combining support from logistics operators, and shippers to co-invest in e-truck pilots.

Case Insight – Chandigarh Workshop: A regional consumer goods shipper agreed to pilot 2–3 e-trucks but only if operation related subsidies cover viability gaps in the first 12 months and if a training partner is onboarded for EV-specific driver skill development.



3. Logistics Service Providers (LSPs) and Truck Fleet Operators

LSPs and owner-operators emphasized that **upfront cost** remains the **primary bottleneck** with current ZET prices still 2-3x higher than diesel trucks in many segments.

- ➔ **Financing and Resale Risk:** Many fleets owners fear being stuck with **low resale value assets**. They called for **lease-to-own programs**, concessional loans through SIDBI or IREDA, and **vehicle insurance products** tailored to EV risks.
- ➔ **Scrappage-Linked Grants:** Several LSPs supported **scrappage-linked incentive structures under PM E-DRIVE**, which rewards diesel vehicle retirement with grant support for new ZETs.
- ➔ **Uptime & Support Ecosystem:** Training for EV maintenance and **roadside support networks** were raised as key needs especially for longer-haul deployments or unplanned route deviations.
- ➔ They expect OEMs to justify ZET models that are reliable, durable, and specifically designed for Indian operational realities. This includes expectations for multiple GVW and model options, ongoing support, including maintenance services, spare parts availability, and training programs for drivers and technicians.



4. Government

The government's mandate is to function as a **market enabler**, de-risking the ecosystem to unlock private capital and drive structural change.

- ➔ The government stakeholders indicated that the **Original Equipment Manufacturers (OEMs)** should have a clear, long-term product roadmap for ZETs to help align their plans with national decarbonization goals.
- ➔ It is incumbent upon the government to establish a clear and predictable economic environment. This involves setting dedicated, low electricity tariffs for ZET charging and instituting incentives like toll waivers and registration fee exemptions to demonstrably lower operational expenses over the vehicle's lifecycle.
- ➔ The government stakeholders indicated that the **Logistics Service Providers (LSPs) and Truck Operators** should aggregate demand for ZETs and commit to long-term contracts to create a strong market signal for manufacturers and financiers.



5. Financial Institutions

Financial institutions, while cautious, are ready to support ZET adoption if the investment risks are managed.

- ➔ Financial Institutions expect the government to provide clarity on policies, such as land use, charging infrastructure hub/depot siting, and grid connection procedures, to reduce administrative delays and soft costs associated with building charging infrastructure.
- ➔ Financial institutions expect OEMs to provide a clear understanding of ZET technology, safety standards, and long-term performance to accurately assess risk and residual value. To make ZETs a “bankable asset,” financiers require OEMs to provide **reliable data from pilot projects and real-world performance** to validate vehicle longevity and performance.
- ➔ Adoption of innovative business models like **Battery-as-a-Service and Truck-as-a-Service**, which can optimize cash flow, transfer asset risk, and ultimately make ZETs a more bankable asset class.

Case Insight – Mumbai Workshop: A port-linked fleet operator explained that despite a strong sustainability mandate from its parent company, they could not proceed with a 20-truck ZET order because financing offers required over 40% equity contribution and provided no residual value security. They indicated that if concessional loans with residual buy-back guarantees were available, adoption could start within 6–8 months.

Overall, stakeholders expect an integrated approach: multi-year fiscal incentives and regulatory relaxations (e.g. weight allowances, tax waivers), matched with industry commitments to deliver reliable vehicles and services. Building trust through well-publicized demonstration projects, and coordinating central and state schemes, were seen as essential for converting interest into actual orders.

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From Awareness To Action
Regional Perspectives on Battery-Electric Trucks
