

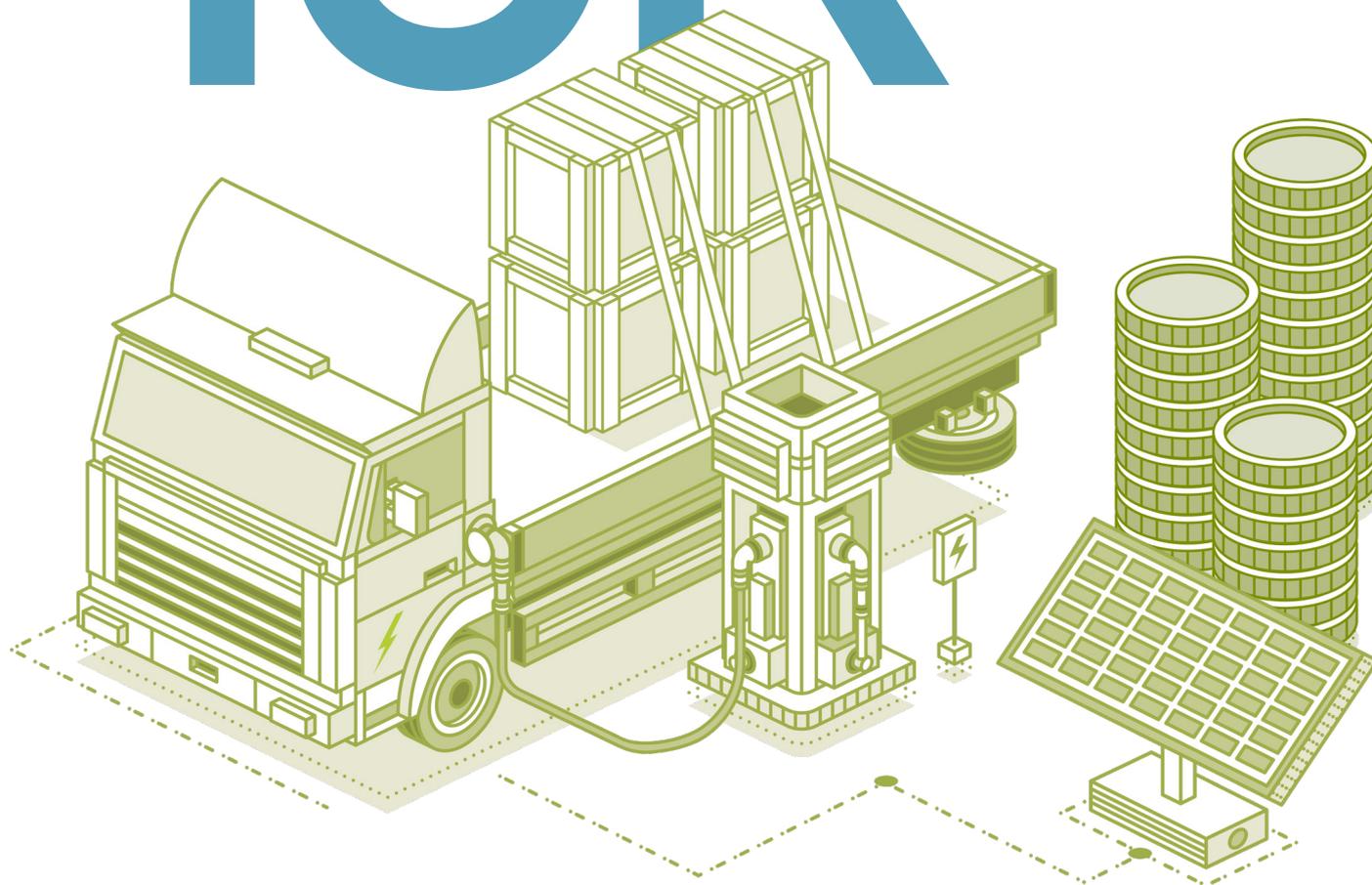


ELECTRIC  
MOBILITY  
FINANCIERS  
ASSOCIATION  
of INDIA

# 10K

THE FIRST

HOW TO FINANCE  
INDIA'S FIRST 10,000  
ZERO-EMISSION TRUCKS



To support India's transition to ZETs, a solution-oriented financing strategy can be employed to address key risks — product, customer, operational, and residual value — while reducing lenders' loss exposure.

This strategy includes tools such as warranties, buyback programmes, charging-as-a-service agreements, revenue and residual value guarantees, mezzanine financing, risk-sharing facilities, and tailored insurance products.

This solution guide also suggests practical implementation pathways and roles for OEMs, charging operators, fleet operators, and financiers to guide early deployment. Mobilising ZET financing at scale will require targeted de-risking, cost reduction, and collaborative effort—but with the right tools and alignment, this transition is both viable and transformative.

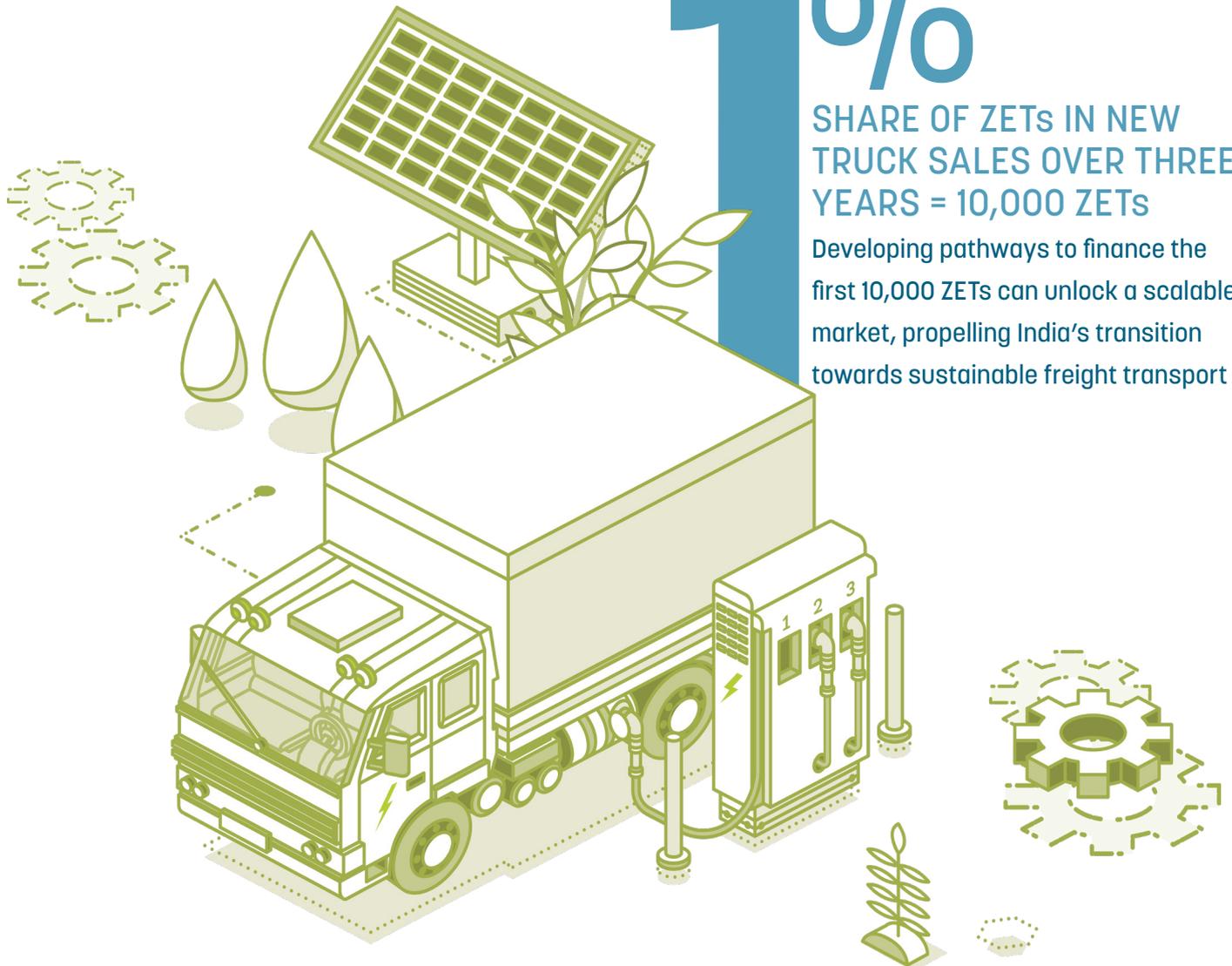
# 1.0 MARKET INSIGHTS

## 10,000 ZETs AND WHY THEY MATTER

1%

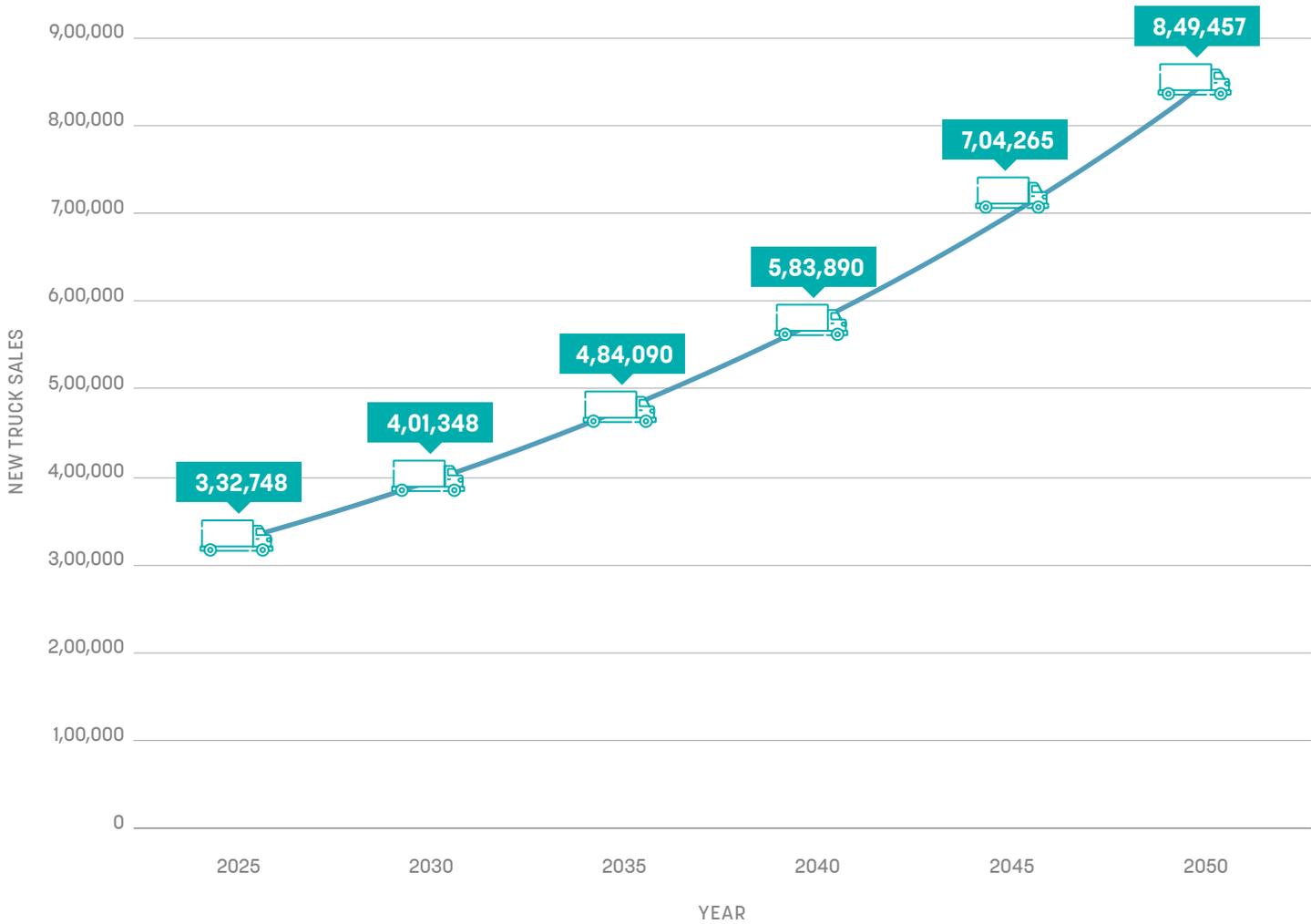
SHARE OF ZETs IN NEW TRUCK SALES OVER THREE YEARS = 10,000 ZETs

Developing pathways to finance the first 10,000 ZETs can unlock a scalable market, propelling India's transition towards sustainable freight transport



# MARKET OVERVIEW

## PROJECTED ANNUAL TRUCK SALES IN INDIA



Source: RMI analysis based on VAHAN dashboard and *Electric Vehicle Outlook 2025*, BloombergNEF.

# UNDERSTANDING ZET AVAILABILITY, COSTS, AND SEGMENT-SPECIFIC APPLICATIONS



## MEDIUM-DUTY TRUCKS (MDTs)



## HEAVY-DUTY TRUCKS (HDTs)

### PRODUCT OVERVIEW

**5** OEMs

**6** MODELS

**10** OEMs

**12** MODELS

### TYPICAL USE CASES



FMCG, last-mile logistics, cold-chain logistics, mid-mile logistics



E-commerce, mining, container movement at ports, construction aggregates, perishables, steel and cement, long-haul freight

### VEHICLE RANGE (km)



### UP-FRONT COSTS



- **New MDTs:** INR 50–90 lakh
- **Retrofitted MDTs:** INR 30–40 lakh
- **Three times higher up-front cost than ICE MDTs, mainly due to battery prices.**



- **New HDTs:** INR 1–2 crore
- **The battery is the biggest cost driver**

### OPERATIONAL COSTS



- **TCO is 14%–22% higher than ICE MDTs**
- **Fuel savings:** 65% greater efficiency than diesel
- **MDT ZET cost/km:** 19.3 INR/km (drops to 15.4 INR/km with defrayed interest and charging rates)
- **ICE MDT:** 15.1 INR/km

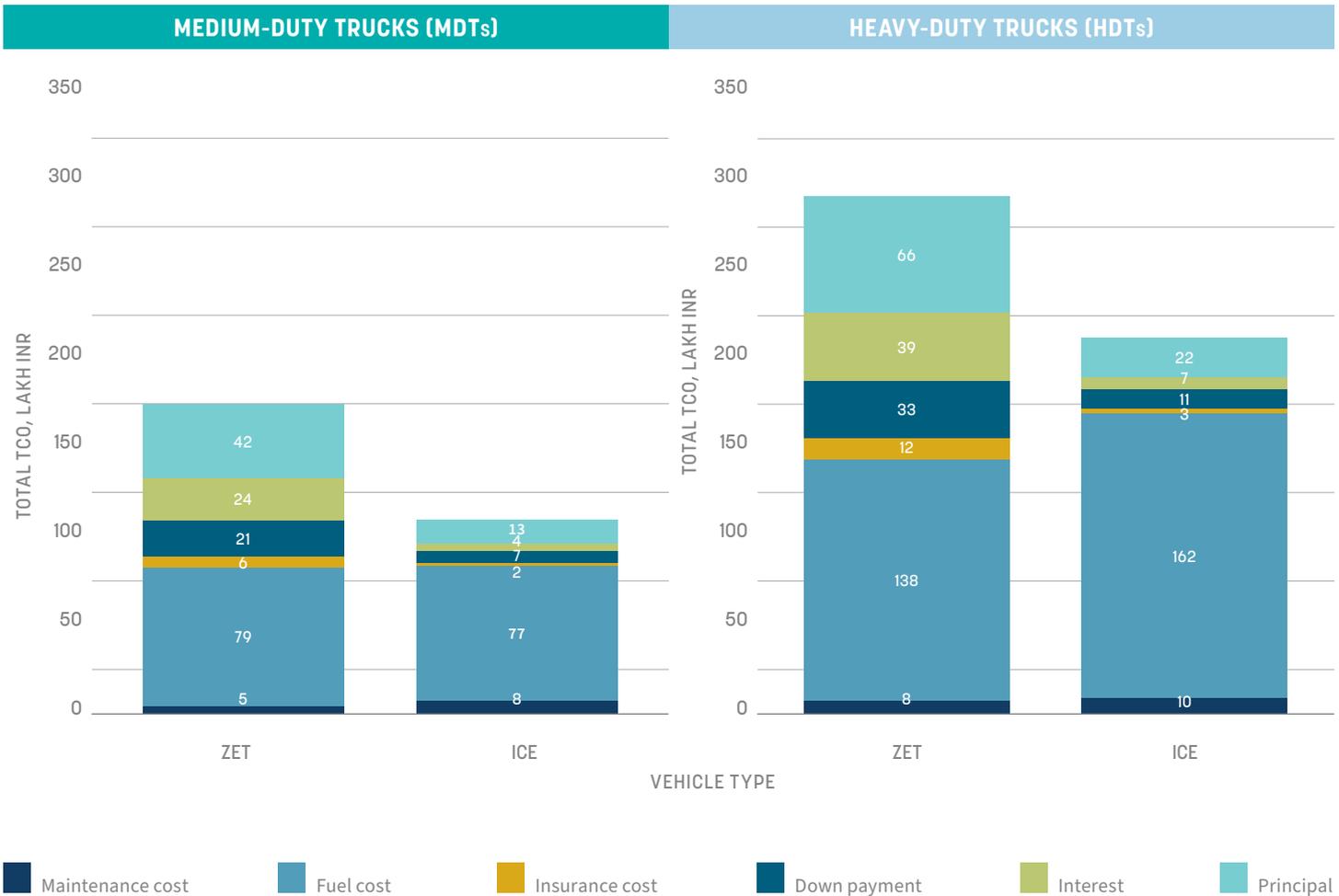


- **TCO is 14%–22% higher than ICE HDTs**
- **Fuel savings:** 65% greater efficiency than diesel
- **HDT ZET cost/km:** 34.2 INR/km (drops to 25.5 INR/km with defrayed interest and charging rates)
- **ICE HDT:** 29.3 INR/km

## ZET VS. ICE TOTAL COST OF OWNERSHIP (TCO)

Zero-emission trucks (ZETs) currently have significantly higher up-front and total costs than diesel trucks, but offer long-term savings and are expected to reach cost parity by the end of the decade. Thus, policy support will be key to bridge the interim gap.

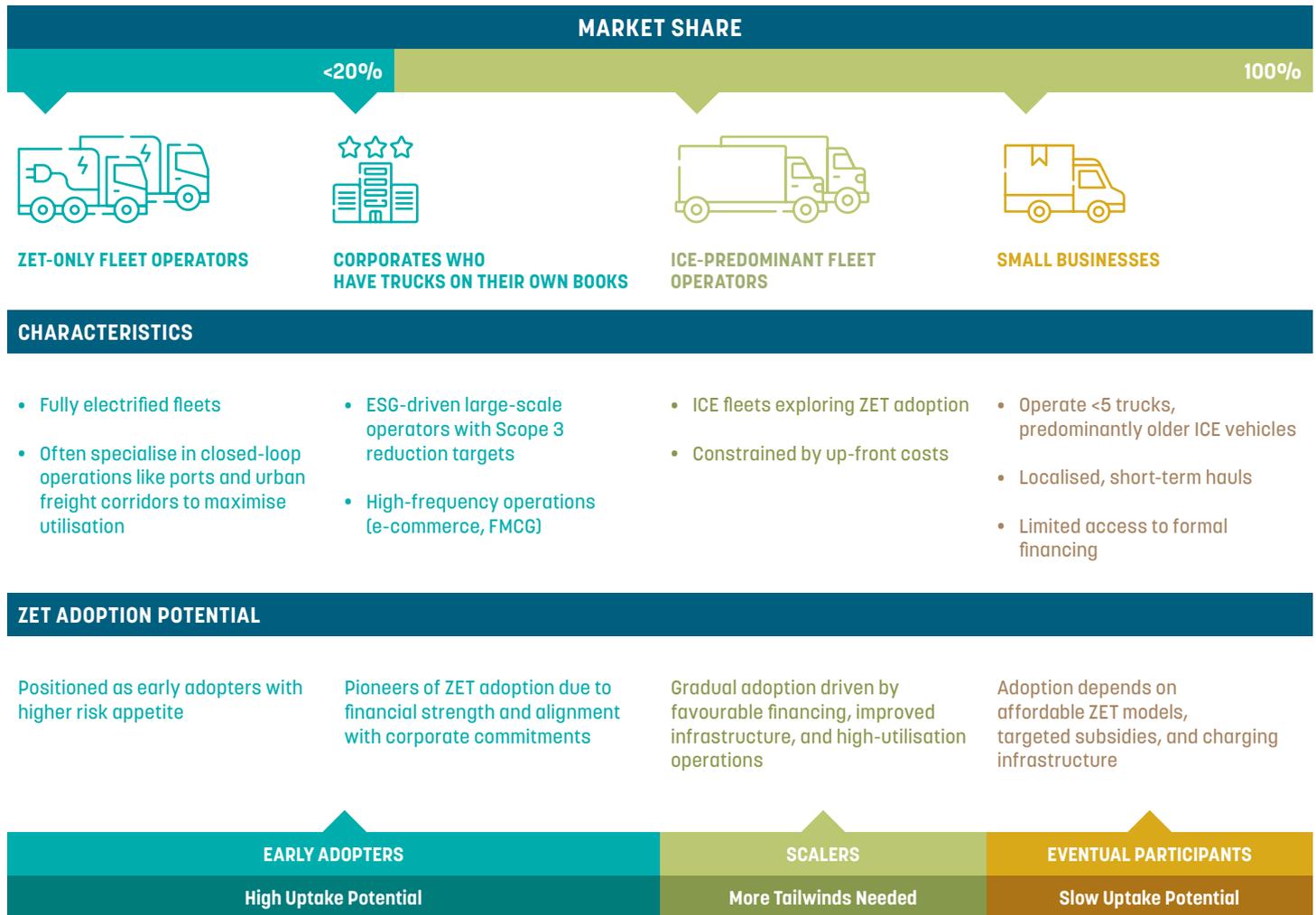
### MDV AND HDV TOTAL COST OF OWNERSHIP



**Source:** RMI, *Accelerating Zero-Emissions Trucking Policies: A Global Policy Handbook with a Roadmap for India, 2025*.

**Note:** A seven-year period was chosen as it represents the typical lifespan of a truck before it is resold. This aligns with the completion of common lending and borrowing terms and corresponds with the typical useful life cycle of a truck's battery.

# ADOPTION TRENDS



Source: Market actor conversation with author (Market share statistics), CareRatings research, and RMI

# 2.0 CHALLENGES AND RISKS

## CHALLENGES

**PRODUCT, CUSTOMER, OPERATIONAL, AND RESALE UNCERTAINTIES ELEVATE DEFAULT PROBABILITY AND LOSS RECOVERY**

	ZET MARKET RISK		RISK COMPARED TO ICE TRUCKS
 <b>CUSTOMERS</b>	<ul style="list-style-type: none"> <li>High up-front cost – approximately three times that of ICE trucks.</li> <li>No premium pricing for ZET contracts</li> </ul>	 <b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>Financing ZETs involves greater risk due to the higher price point and the potential for over-leveraging</li> <li>Market volatility impacts both equally</li> </ul>
 <b>PRODUCT</b>	<ul style="list-style-type: none"> <li>Uncertainty in the performance, reliability, and technology of ZETs particularly around battery life and payload handling</li> </ul>	 <b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>ICE trucks have established reliability, whereas ZETs face significant performance and market uncertainty</li> </ul>
 <b>OPERATIONS</b>	<ul style="list-style-type: none"> <li>Limited charging infrastructure and technician availability</li> <li>Grid stability issues like power surges and demand peaks</li> </ul>	 <b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>ICE trucks do not face the same infrastructure or energy supply-related risks, making ZET operations more complex. ICE truck mechanics and service stations are readily available</li> </ul>
 <b>REPOSSESSION</b>	<ul style="list-style-type: none"> <li>The lack of data on the value of used products makes cost recovery at repossession challenging</li> </ul>	 <b>SAME RISK</b>	<ul style="list-style-type: none"> <li>Repossession processes are largely comparable for ZETs and ICE trucks given that all trucks are fitted with devices for tracking geolocation</li> </ul>
 <b>RESIDUAL</b>	<ul style="list-style-type: none"> <li>No secondary market or benchmarks for end-of-life values</li> </ul>	 <b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>ZETs face unique residual value risks due to limited resale and recycling opportunities, unlike ICE trucks with established resale ecosystems</li> </ul>

# UNDERSTANDING RISK IN ZET FINANCING

Product, customer, operational, and resale uncertainties elevate default probability and recovery risk. Overcoming these challenges requires targeted interventions to support the ZET transition and improve risk management.

## ROLES OF BANKS AND NBFCs IN FREIGHT ELECTRIFICATION

FINANCING OF EXISTING ICE TRUCKING MARKET	FINANCING APPROACH FOR ELECTRIC TWO-, THREE-, AND FOUR-WHEELERS	INTEREST IN FINANCING ZET MDV AND HDV
<b>BANKS</b>		
Dominate new truck lending (30%–40% share), serving large fleet operators with low-risk <sup>1</sup>	Focussed on EVs for two-, three-, and four-wheelers, hesitant about MDV/HDV ZETs due to high product risk and secondary market gaps	Cautiously exploring MDV/HDV ZETs for creditworthy corporates
<b>CAPTIVE NBFCs</b>		
Primarily finance parent OEM vehicles, offering competitive rates	Cautious about ZET offerings, however, providing bundled extensions to warranties <sup>3</sup>	Interested in MDV/HDV ZETs when they align with OEM goals
<b>NON-CAPTIVE NBFCs (LARGE)</b>		
Key players in used commercial vehicle financing, catering to small/medium operators at 12%–14% interest rates <sup>2</sup>	Gradually financing LDVs, leveraging OEM partnerships for flexible terms and residual value guarantees	Interested in ZET lending subject to OEM collaboration and risk-sharing for predictable use cases
<b>NON-CAPTIVE NBFCs (SMALL, WITH DEDICATED PORTFOLIO)</b>		
Have a small portfolio of ICE loans; target underserved borrowers	Specialise in financing smaller EVs, leveraging digital tools for high-risk segments	Interested in MDV/HDV ZETs and in piloting ZET lending programmes supported by concessional or blended finance

**Source:**

- CareRatings, [https://www.careratings.com/uploads/newsfiles/07022023045309\\_CV\\_Financing\\_Set\\_to\\_Bounce\\_Back\\_in\\_FY23\\_as\\_Sales\\_Volumes\\_Recover.pdf](https://www.careratings.com/uploads/newsfiles/07022023045309_CV_Financing_Set_to_Bounce_Back_in_FY23_as_Sales_Volumes_Recover.pdf).
- Stakeholder conversations
- Tata OK Raksha, <https://tataok.tatamotors.com/tata-ok-raksha/>.

# 3.0 MARKET INTERVENTIONS

## DE-RISKING EARLY LENDING

Reducing default risk is key to unlocking ZET lending. Effective management of product, customer, and operational risks can drive financing. Once loans are issued, mitigating losses and financier liability becomes essential. Prioritising risk reduction — followed by loss mitigation — is vital for scaling ZET financing.

### INTERVENTIONS TO MANAGE RISK AND MOBILISE FINANCE FOR ZETS

REDUCING LIKELIHOOD OF DEFAULT	
 PRODUCT	<b>Warranties and Buyback Guarantees:</b> Agreements that outline liability and, in some cases, include a buyback provision in the event of a ZET failure or repair help safeguard against product failures.
 CUSTOMER	<b>Mezzanine Facility:</b> A structured finance mechanism that bridges up-front ZET costs. <b>Revenue Assurance Contracts:</b> Multi-year freight agreements with corporate aggregators ensure predictable cash flows, stabilising revenue streams for loan repayments.
 OPERATIONS	<b>Service-Level Agreements (SLAs):</b> Contracts covering maintenance, spare parts availability, and penalties for noncompliance, safeguarding fleet performance. <b>Charging-as-a-Service:</b> Agreements with charging providers to develop, maintain, and operate charging infrastructure, transferring installation and operational risks.
REDUCING LOSSES IN THE EVENT OF A DEFAULT	
 RESIDUAL	<b>Residual Value Guarantees (RVGs):</b> A guarantor secures a stipulated resale value.
 REMAINING	<b>Residual Sharing Facilities (RSFs):</b> Reduce financier's liability in case of default.

## INTERVENTIONS TO MANAGE RISK AND MOBILISE FINANCE FOR ZETs

### REDUCING INTEREST COSTS



STOP-GAP

**Concessional On-Lending:** Concessional capital is offered to financiers to on-lend for ZET procurement, mobilising capital, and incentivising lending to ZETs.

### ENABLING INSURANCE COVERAGE

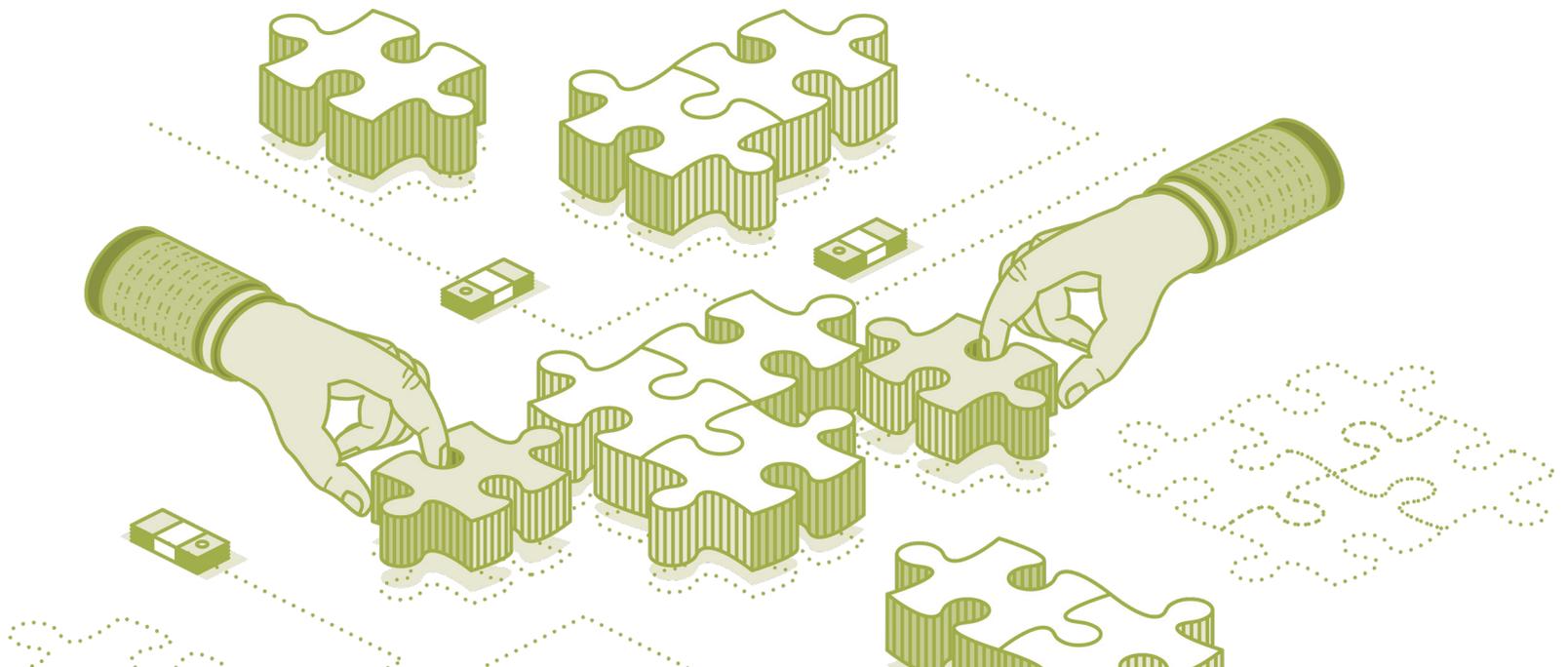


INSURANCE

**Comprehensive Insurance Products:** Comprehensive insurance covers specific ZETs and batteries as well as residual risk, and the financier can claim compensation for the vehicle in case of an accident or theft.

## CONTRACTUAL AGREEMENTS IMPROVE UPTIME, REPAYMENT CERTAINTY, AND AFFORDABILITY

Contractual agreements play a key role in risk management by allocating specific responsibilities — such as maintenance, performance, or delivery — to the party best suited to take these on. These are formal commitments between parties that define the terms and conditions under which one party assumes responsibility for ZET repairs, servicing, or freight shipments, helping to establish liability and ensure accountability.



## LONG-TERM WARRANTIES AND BUYBACKS — PROVIDE PRODUCT ASSURANCE

### BATTERY WARRANTIES

Coverage for 5–7 years, including explicit coverage for the battery

### BUYBACK COMMITMENTS

Reduces residual value risk

## REVENUE ASSURANCE CONTRACTS — LOCK IN FREIGHT DEMAND

### MINIMUM VOLUME COMMITMENTS

Freight contracts spanning 5+ years to stabilise revenue

### REVENUE FLOOR PROTECTION

Large cargo aggregators offer backstop contracts ensuring stable cash flows

### INDEXATION MECHANISM

Freight rates adjust in response to electricity and operational cost fluctuations

## SERVICE-LEVEL AGREEMENTS (SLAs) — REDUCE OPERATIONAL DOWNTIME

### MINIMUM UPTIME GUARANTEE

95%+ uptime commitment with penalties for downtime

### MULTI-YEAR SLAs

SLAs should extend over the full loan tenure (5–7 years) to reduce vehicle downtime and unplanned maintenance

## CHARGING-AS-A-SERVICE (CaaS) — ASSURES CHARGING ACCESS

### FIXED MONTHLY SUBSCRIPTION

Fleets pay per kWh or a fixed monthly fee instead of large Capex outlays

### GUARANTEED CHARGER UPTIME

Penalty-backed commitments for charger availability to prevent downtime

### ON-SITE DEPOT CHARGING

Customisable fleet solutions ensuring overnight charging readiness

Financial mechanisms define who pays what and when, helping to direct and attract investment for ZET adoption.

FINANCIAL MECHANISM	IMPACT	CRITICAL IMPLEMENTING ACTORS
MEZZANINE FACILITY	Can address customer risk by mitigating default risk by easing the fleet operator's up-front financial burden, preventing overleveraging	Third-party facility manager and multilateral development banks (MDBs) or development finance institutions (DFIs) in collaboration with financiers
RESIDUAL VALUE GUARANTEE	Provides an assured resale value, and enables financiers to hedge against losses	A third-party guarantor, either a private actor or MDB/DFI
RISK-SHARING FACILITY	Distributes loss in instances of default	Guarantors and financiers



## MEZZANINE FACILITY



### WHAT IT DOES

- Bridges the gap between lender financing and fleet operator down payment
- Lowers up-front costs, making ZETs more accessible
- Offers flexible repayment via equity, convertible loans, or subordinate debt



### DESIGN CONSIDERATIONS



#### LTV adjustment

Lowers effective LTV by covering the down payment through equity, easing up-front costs for fleet operators



#### Flexible repayment

Grace periods allow revenue generation before repayments begin



#### Risk allocation

Mezzanine providers such as DFIs absorb a portion of financial risk, making loans more viable for banks



#### Fund management

Third-party intermediaries structure financing, monitor operator viability, and provide operational support



### HOW IT WORKS

- **Financiers** provide up to 80%–85% of ZET cost
- **Fleet operators** cover the remaining 15%–20%
- **DFIs/third-party fund managers** fund part of the down payment through:
  - **Equity investment** (DFIs take a stake in the fleet)
  - **Convertible loan** (loan converts to equity over time)
  - **Subordinate debt** (debt repaid after primary loan)



### IMPLEMENTATION CHALLENGES

- **Capital availability:** DFIs and investors need clear exit pathways to participate
- **Borrower creditworthiness:** Fleet operators must demonstrate financial viability to secure mezzanine funding
- **Market acceptance:** Lenders must integrate mezzanine structures into conventional loan frameworks



### WHY IT MATTERS

- Lowers up-front ZET costs by reducing the down payment burden
- Expands access to financing for fleet operators with limited capital
- Provides structured, flexible financing models to support early ZET adoption



## RESIDUAL VALUE GUARANTEE



### WHAT IT DOES

- Ensures a minimum resale value for ZETs after a lease term
- Reduces risk for financiers, fleets, and OEMs in early adoption
- Facilitates structured buyback and secondary market growth



### DESIGN CONSIDERATIONS



#### Market calibration

RVG pricing must align with ZET depreciation trends to ensure viability



#### Monitoring and compliance

Telematics enable real-time tracking of battery health, mileage, and usage



#### Safeguards

Routine health checks and preventive maintenance protocols protect against unexpected depreciation



#### Pilot programmes

Structured trials with large fleets help refine risk assumptions and validate secondary market appetite



### HOW IT WORKS

- **Buyback agreements** with OEMs secure resale value
- **Private guarantors** and DFIs back residual value commitments
- **Coverage estimates** offer a guarantee of 10–20% of the ZET's original value, in return for a 2–3% per annum fee



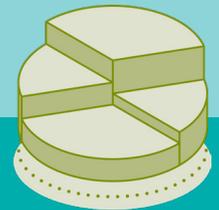
### IMPLEMENTATION CHALLENGES

- **Residual value uncertainty:** Nascent ZET markets lack sufficient historical data, making pricing and guarantee structuring complex
- **Perceived product risk:** If not positioned carefully, RVGs can signal a lack of confidence in ZET technology, deterring adoption
- **Market volatility:** Changes in battery technology and policy shifts may impact resale values, requiring flexible guarantee structures



### WHY IT MATTERS

- Reduces uncertainty in residual values, improving lender and fleet confidence
- Enhances financing viability by mitigating resale risk for financiers
- De-risks early-stage investment, accelerating ZET adoption





## RISK-SHARING FACILITY



### DESIGN CONSIDERATIONS

#### Loan-level RSFs suit ZETs

Individual loan coverage preferred over portfolio-level RSFs due to high capital intensity and gradual fleet adoption

#### Selecting risk allocation models

First-loss coverage (80%–85%) builds lender confidence, pari-passu suits moderate-risk borrowers, while second-loss is better for mature markets

#### Fee structure and tiering

A tiered fee model (0.5%–1.5% of loan amount) ensures sustainability, reflecting borrower risk profile and fleet size

#### Managing concentration risk

RSFs should cap exposure per borrower and diversify across use cases (e.g., long-haul, urban logistics)

#### Monitoring impact

Regular tracking of disbursement, claims, and socio-economic outcomes to refine facility effectiveness



### WHAT IT DOES

- Offsets financier losses in case of borrower default
- Encourages lending confidence for ZET adoption
- Can be structured at loan or portfolio level for risk mitigation



### HOW IT WORKS

- **Financier** provides loan to fleet operator
- **Guarantor** (DFI or third party) absorbs a portion of losses if default occurs
- **Risk-sharing structure** varies (first-loss, pari-passu, or second-loss coverage)



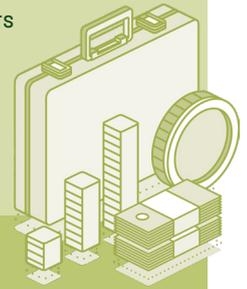
### IMPLEMENTATION CHALLENGES

- **Balancing risk and affordability:** RSFs should offer meaningful risk reduction while keeping fees viable
- **Market maturity constraints:** Financiers may still hesitate to lend despite RSF coverage
- **Borrower segmentation:** RSFs should consider differentiating coverage based on fleet operator creditworthiness



### WHY IT MATTERS

- Reduces financier risk to unlock ZET capital
- Creates market confidence for fleet lending
- Supports scalable, long-term investment in zero-emission transport



# 4.0 NEXT STEPS

## ACTIONS NEEDED BY FINANCIERS

### A. FINANCIERS (BANKS, NBFCs)

□ Offer loans, leases, and other financing products to fleet operators, ensuring the up-front costs of ZET procurement are manageable

□ Shape the design of financing interventions, including RVGs, RSFs, mezzanine financing, and concessional on-lending facilities

□ Build technical depth in understanding ZET technology to facilitate underwriting of the asset

□ Engage with MDBs and DFIs to secure concessional capital or guarantees that lower the cost of financing

### B. DFIs, MDBs

□ DFIs and MDBs can significantly reduce the cost of mezzanine financing for borrowers by lowering the equity stake required

□ Provide technical expertise and guidance regarding the creation of an RSF and conduct the cost-benefit analysis needed to support RSFs

□ Explore the design of a concessional on-lending facility, conceptualising the facility size and the transaction costs for the parties involved to drive the greatest market impact

□ Engage with financiers to iterate on terms and conditions and optimal structured finance intervention(s) to accelerate ZET market growth

## ACTIONS NEEDED BY MARKET ACTORS

### C. OEMs

□ Offer extended warranties for ZETs and/or batteries that align with the loan tenure

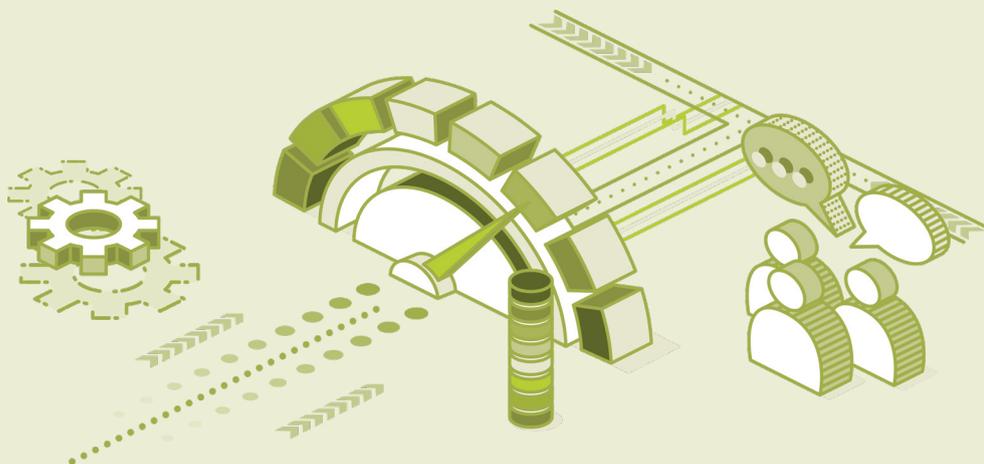
□ Offer buybacks at the onset of ZET purchase

□ Offer service-level agreements

□ Produce high-quality, reliable vehicles and invest in technological advancements to minimise product risk and enhance long-term performance

### D. CPOs

□ Offer charging-as-a-service to fleets, installing, managing, and maintaining charging infrastructure to provide seamless on-site charging



## E. FLEET OPERATORS (ZET BORROWERS)

- Partner with charging operators to ensure smooth access to charging, lowering operability risk
- Enter into warranties and service-level agreements wherever possible
- Enter and pursue revenue assurance contracts
- Explore and procure comprehensive insurance covers
- Seek to maximise ZET utilisation and minimise uptime to maximise operational cost savings and revenue generation to support the financial case of ZET procurement

## F. THIRD PARTIES

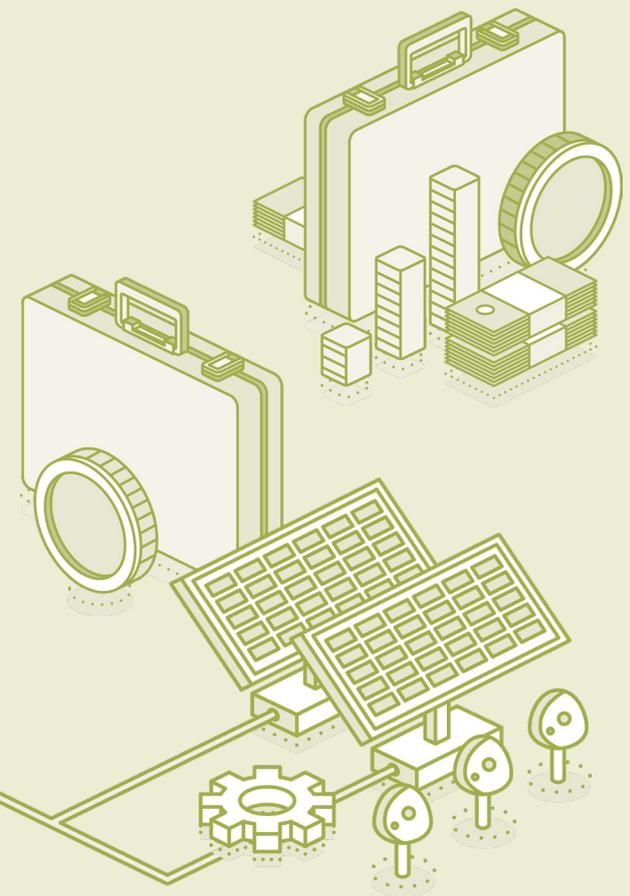
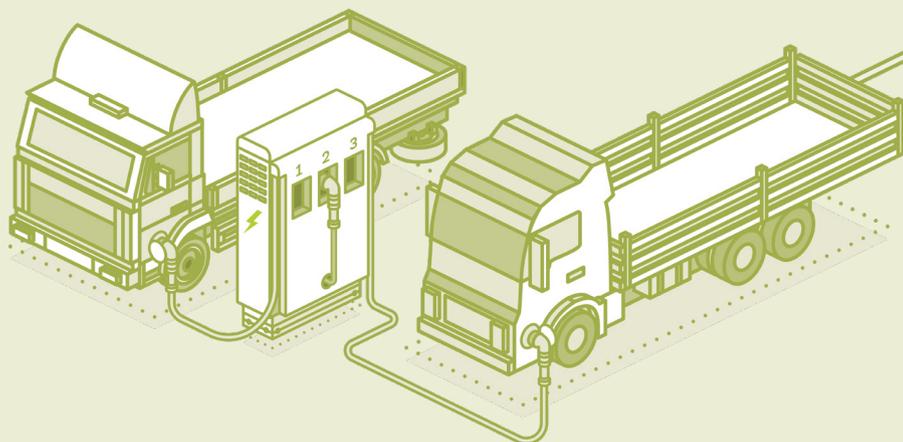
- Trial residual value guarantees for ZETs
- Foster the creation and administration of a mezzanine financing facility for ZETs

## G. INSURERS

- Offer ZET-specific comprehensive insurance products at competitive prices

## H. END USERS (CORPORATIONS PAYING FOR FREIGHT TO BE SHIPPED)

- Establish revenue agreements with fleet operators that define freight shipment volumes over fixed periods, ideally with long durations, to ensure greater stability



# APPENDIX

## NON-EXHAUSTIVE LIST OF HDV TRUCKS CURRENTLY IN THE MARKET (GREATER THAN 12 TONS)

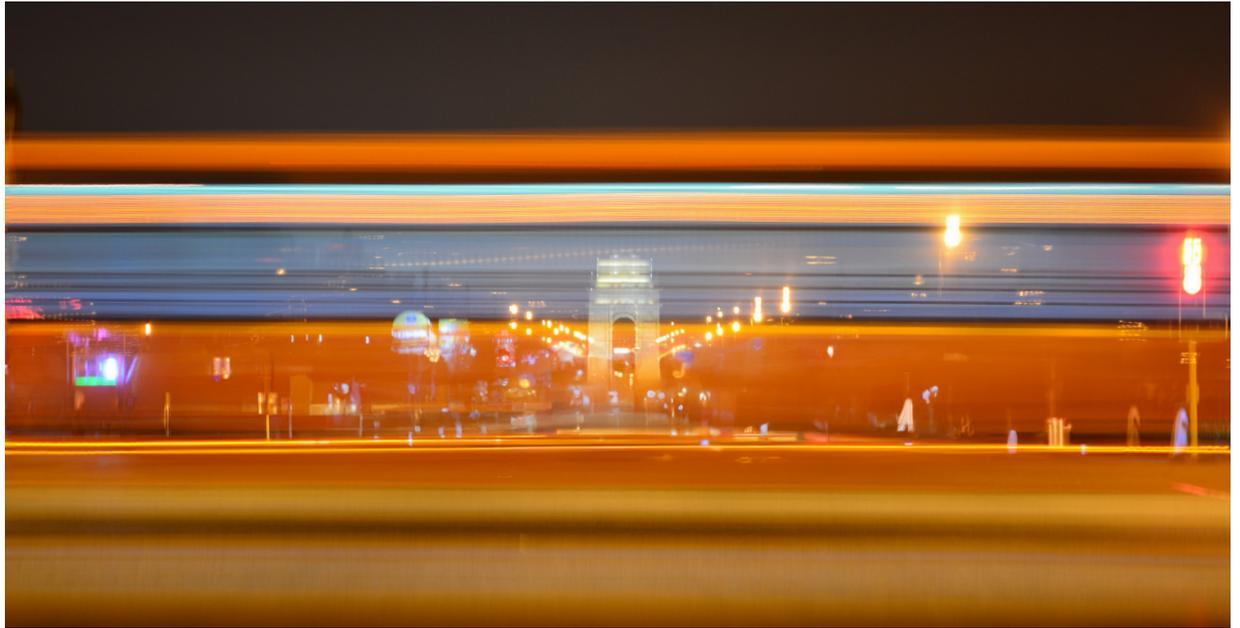
TONNAGE	PARENT COMPANY	OEM NAME	TRUCK MODEL	RANGE (km)	TYPICAL USE CASE
12.9 tons	KALYANI POWERTRAIN	Bharat Forge	Repowered Electric Truck (Retrofit)	110–130	FMCG and last-mile logistics
14 tons	ASHOK LEYLAND	Ashok Leyland	Boss 14T BEV	230	FMCG, auto parts, e-commerce logistics (e.g., Amazon)
18 tons	ASHOK LEYLAND	Ashok Leyland	18T Electric Truck	210 or 310*	E-commerce FMCG
28 tons	MEGHA ENGINEERING	Olectra	28T Electric Truck	120–150	Mining
28 tons	TATA MOTORS	TATA Motors	Prima H.28	550	Cement, steel, coal, agriculture
45, 55 and 60 tons	PROPEL INC.	Propel	EV Dumper Truck	N/A	Mining and construction
44 tons	VOLVO	Volvo	FM Electric	300	Mining and construction
55 tons	MURUGAPPA GROUP	IPL Tech	RHINO 5536E	185	Mining and construction, container movement at ports, steel, cement
55 tons	ASHOK LEYLAND	Ashok Leyland	AVTR 55T 4x2 Electric Tractor	185	Mining and construction, container movement at ports, steel
55 tons	TATA MOTORS	TATA Motors	E55 S	350–500	Cement, steel, coal, agriculture
55 tons	PINNACLE INDUSTRIES LIMITED	EKA Mobility	55T	200	Mid-mile logistics
75 tons	BYD	BYD	Q1R –75 Tons Maximum	100	Ports mainly

\*Based on two differing battery configurations. Source: RMI

## NON-EXHAUSTIVE LIST OF MDV TRUCKS CURRENTLY IN THE MARKET (3.5 TO 12 TONS)

TONNAGE	PARENT COMPANY	OEM NAME	TRUCK MODEL	RANGE (km)	TYPICAL USE CASE
3.5 tons	ASHOK LEYLAND	Switch Mobility	Switch iEV4	120	FMCG and last-mile logistics
3.5 tons	PINNACLE INDUSTRIES LIMITED	EKA Mobility	7T	200	Mid-mile logistics
5.45 tons	VOLVO EICHER	VE Commercial	Eicher PRO 2055 EV	162	FMCG and last-mile logistics
5.5 tons	OMEGA GROUP	Omega Seiki Mobility	Rage+ Frost HD Cargo	180	FMCG and cold chain logistics
7.2 tons	ASHOK LEYLAND	Switch Mobility	Switch iEV8	250	Mid-mile logistics
7.4–8.7 tons	TATA MOTORS	TATA Motors	Ultra T 7-Retrofit	100	FMCG and mid-mile logistics

Source: RMI



Rocky Mountain Institute, or RMI, is an independent, nonpartisan nonprofit founded in 1982 that transforms global energy systems through market-driven solutions to secure a prosperous, resilient, clean energy future for all. In collaboration with businesses, policymakers, funders, communities, and other partners, RMI drives investment to scale clean energy solutions, reduce energy waste, and boost access to affordable clean energy to enhance security, economics and improve people's livelihoods. RMI is active in over 60 countries.



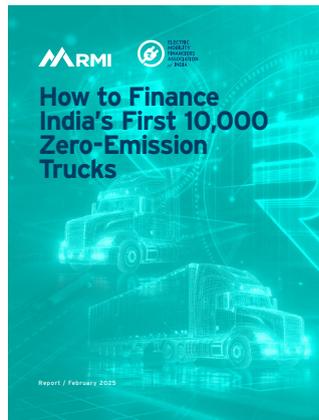
Electric Mobility Financiers Association of India (EMFAI) is a registered professional association representing Indian financial institutions involved in the financing of electric vehicles and other EV ecosystem products and services. The purpose of EMFAI is to help scale electric mobility in India by strengthening financial institutions by bringing up the challenges that these institutions may be facing to government and regulatory/policy-making bodies and helping them in driving business with ease and convenience, providing a common platform for financiers, insurers, guarantors, and fintech companies involved in financing electric vehicles and ancillaries.

BE A CATALYST FOR INDIA'S GROWING ZET ECOSYSTEM. SUPPORT THE SHIFT – DRIVE THE TRANSITION TO ZETs.

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*How to Finance India's First 10,000 Zero-Emission Trucks* outlines strategies to channel ZET financing through the exploration of measures that reduce default risk and potential losses.



ORIGINAL PUBLICATION

SCAN TO READ

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