Sustainable Mobility Greening Road Freight Transport

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Presented By

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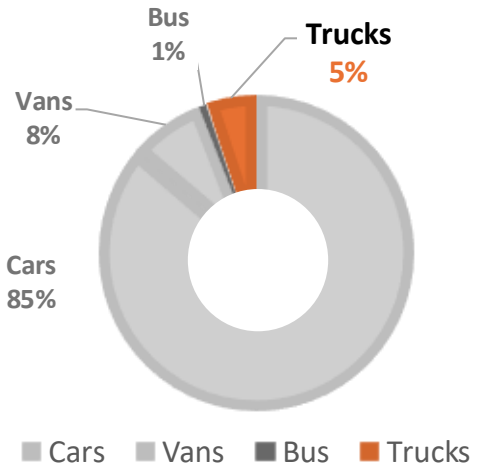
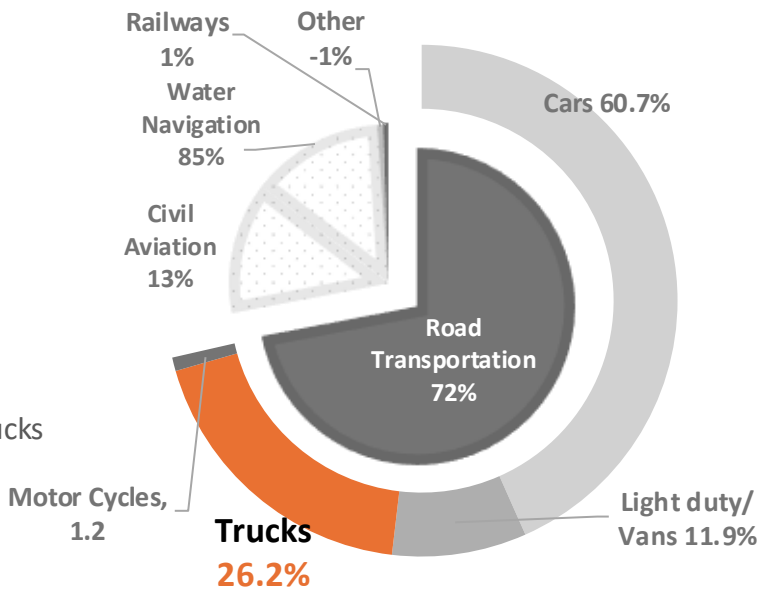
UN environment programme | CTCN UN Climate Technology Centre & Network | PMANIFOLD

Why MHDTs and Corridors?

Vehicles On European Roads



Transport CO2 emissions in the EU



Trucks contribute **5%** of the **total vehicle** share but contribute **>25%** of the road transport **CO_2** emissions

Sources: T&E Truck CO2 Standards; Eurostat/ACEA EU fleet data; The future of road transport in Europe. Environmental implications of automated, connected and low-carbon mobility

Eastern Europe is Freight Power House (leverage TEN-T Network)

Map of Transportation Corridors in the European Union, Map not to Scale for visualization purposes only

Major Corridors	Approx. Length
Baltic Sea – Black Sea – Aegean Sea (BBA)	~2,800 km
Rhine–Danube Corridor	~2,100 km
Baltic Sea – Adriatic Sea Corridor	~1,100 km

e-Trucks Technology & Availability no more a Challenge

Global

> 520k

ZE-MHDVs

China

457k

Accounts for **88%** of global sales

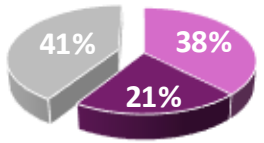
Excl. China

63k

Led by **U.S., EU, India** of global sales

European Union

> 23.7k ZE-MHDVs



- MDT (3.5 T - 12 T) - 8,960 units
- HDT (>12 T) - 5,021 units
- Buses & Coaches - 9793 units

Source: ICCT Global EV Market Monitor: Trucks and Buses (Aug 2026); ZE-MHDVs sold in 2025

Eastern Europe* (selected 5 countries)

520 ZE-MHDTs sold in Eastern EU 2025

2.6x growth vs 2024

* Romania, Poland, Czechia, Hungary, Slovakia

POLAND

- €2Bm zero-emission N2/N3 truck programme
- 550 HDV charging stations targeted on TEN-T
- **CVD: 9%** clean HDV public procurement target

ROMANIA

- €250m public + €299m highway charging
- €1.3Bn EU Modernisation Fund for transport decarbonisation
- **CVD: 7%** clean HDV public procurement target

CZECHIA

- CZK 960m for electric trucks + charging
- **CVD: 11%** clean HDV pubiic procurement target

HUNGARY

- €9,500–10,500 purchase incentive for eligible BEVs
- **CVD: 9%** clean HDV public procurement target

Technology Evolution

Multi Niche Evolution

- Expanding across **urban deliveries, regional haul, port, industrial, construction, mining**
- e-Trucks now span **LDT/MDT/HDT rigid, tractor-trailer** and specialised configurations

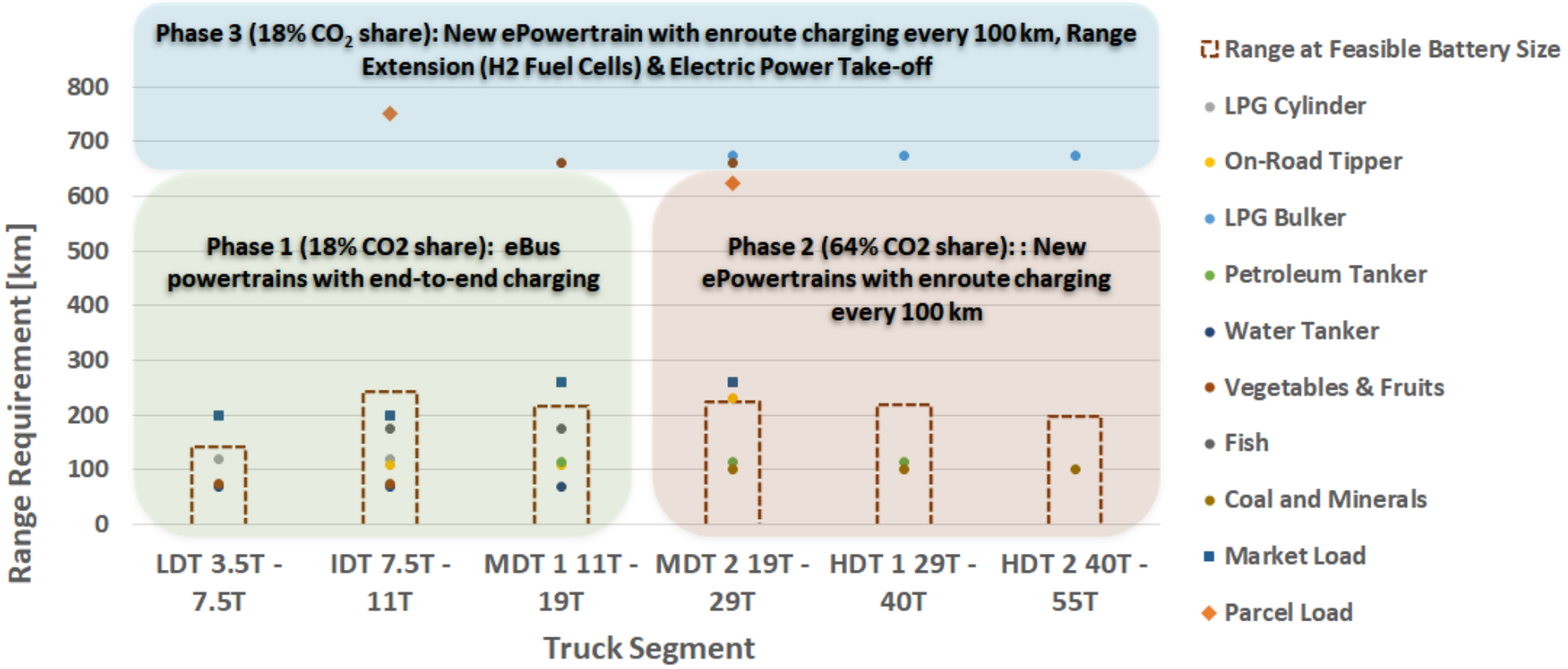
Long Range Batteries

- **Battery capacity is scaling:** from **60–125 kWh** early/urban applications to **500–780 kWh** in current long-haul e-trucks
- **Range is expanding:** from **100–150 km** urban duty cycles to **600–830 km**

High Power Charging

- Charging has progressed from **60–120 kW** fleet/depot charging to **1+ MW** truck charging.
- **Megawatt charging is scaling:** current MCS deployments reach **1.44 MW.**

Prioritize high-utilization predictable Use-Cases



60-80% of use-cases are enabled through Corridors

Source: pManifold Analysis

Prioritize strategic Freight Corridors

Initial Screening of all Corridors
- Intercity Routes
- Toll Booths
- Corridor length
- Logistic & Production hubs

230 corridors

Spatial Screening & Shortlisting
- Consolidate spatial overlaps
- Removing duplicates
- Combining smaller into coherent corridors

103 corridors

Technical Filtering & Validation
- Traffic index < 800 and/or satellite imagery based eliminations
- Stakeholder Consultations

77 corridors

Strategic Refinement & Prioritization
- Alternate routes
- Industrial Density
- Diminishing truck applications

50 corridors

Stakeholders Workshop
- Workshop / roundtable with stakeholders
- Feedback alignment & validations

24 corridors

Multi criteria Evaluation (weighted scoring
- Primary Data – ZET readiness, OEM & Driver surveys
- Secondary Data – Infra availability
- Stakeholder alignment & prioritization
- Weighted score across X, Y, Z dimensions

Final Priority Corridors
- Aggregate final weighted score
- Identify corridors for pilot, investment & implementation

10 corridors

shortlisted **10 corridors**

Source: pManifold & RMI study on India's Priority Corridors for Zero-Emission Trucking

Build Cross-Border Corridor Strategies. Leverage CEF & AFIF.

Consideration factors for Corridors

1. **Corridor Continuity**
   Ensure uninterrupted charging coverage
2. **Interoperability**
   Aligning charging standards
3. **Grid & Energy Coordination**
   Coordinate grid capacity with energy mix
4. **Policy & Market Alignment**
   Harmonise incentives, **tariffs**, **tolls** etc
5. **Investment & Governance**
   Enable joint planning, cross border funding

EU Implementation Examples

TRACECA (Transport Corridor Europe-Caucasus-Asia)

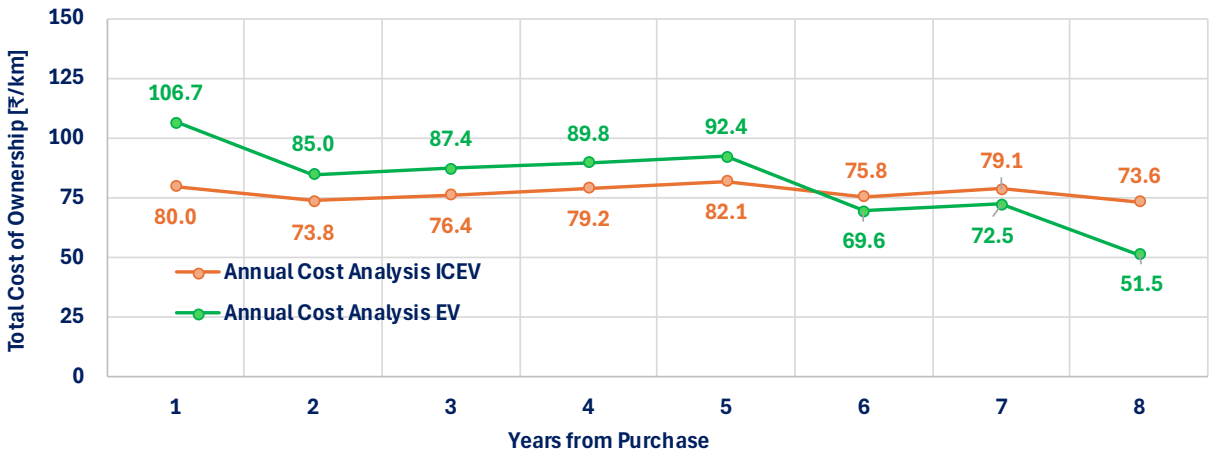
A **14-country multimodal corridor** linking **Europe–Caucasus–Central Asia**, supporting regional trade, connectivity and sustainable cross-border transport.

Source *- EU Clean Transport Corridor Initiative: North Sea–Baltic; Cross-E Cohesion; TRACECA*

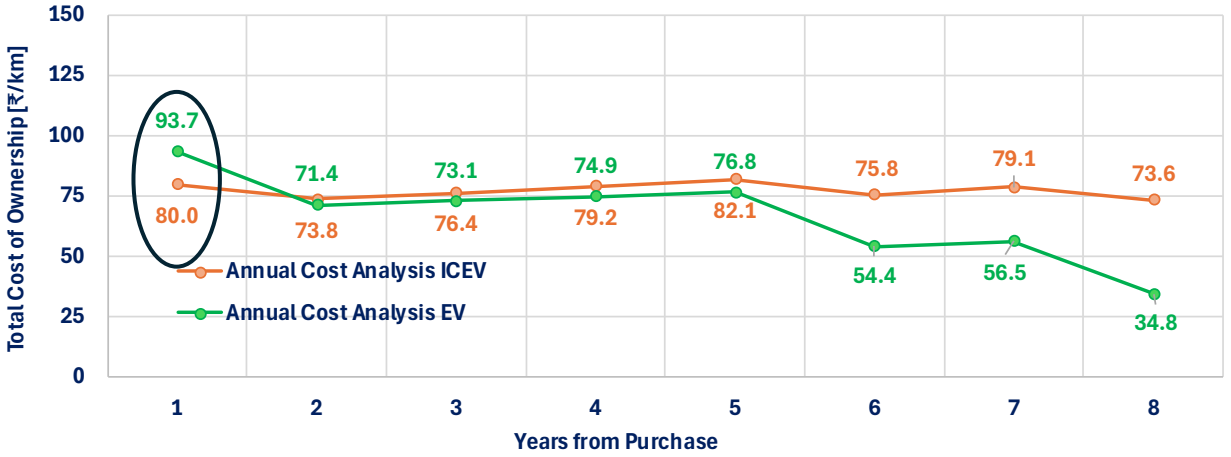
Build Affordability for Operators

Yearly Cost Economics of Electric vs Diesel Truck

Without Interventions



With Interventions

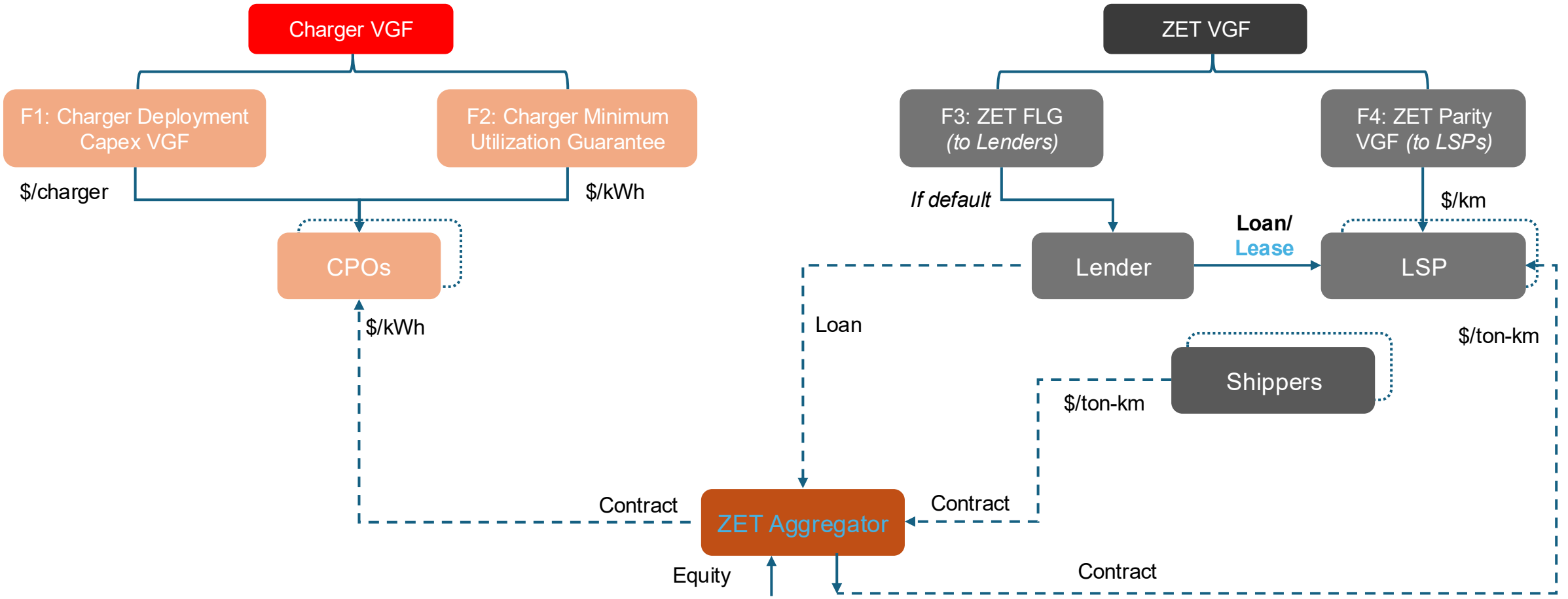


Key Economic Barriers

1. **High upstream cost of Charging Infra**
2. **Low utilization of Charging Infra in early months**
3. **High Financing Cost**
4. **Cash deficit in early year(s)**

Source: pManifold: Catalysing Corridor-scale Zero-Emission Truck deployment for Use case: Bulk Load (Steel, Cement); 380 kms/day; 330 days/year; 2.1 km/Litre for Diesel; 1.4 kWh/km for BET

Drive Financing Innovations to De-risk Demand/ Utilization



Source: pManifold, Climate Group

Create strong Demand and Supply Ecosystem

Targets

- **ZET Adoption** → Sets **phased targets** for ZET **sales**, fleet transition and ICE displacement.
- **Charger Deployment** → Defines **targets for charging coverage**, capacity and corridor availability.
- **Industrialisation** → **Increase** local production and content

Demand-side Measures

- **Incentivise ZET** → Purchase **subsidies, tax benefits**, TCO-gap support, interest subsidy, etc.
- **Disincentivise ICE** → **Increase cost** of ownership of high-emitting ICE trucks.
- **Aggregate & De-risk Demand** → Creates predictable **ZET demand through pilots**, fleet commitments, procurement and aggregation.

Supply-side Measures

- **Vehicle & Technology** → Ensures availability of **suitable ZET models**, components, standards and technology **for use cases**
- **Charging & Energy** → Enables **reliable ZET charging** through grid capacity, sites, tariffs optimisation, renewables and storage.
- **Services & Finance** → Builds the financing, **maintenance**, skills and **after-sales ecosystem** required for ZET robust life cycle management.

Combine:

- ***Public Grants;***
- ***Purchase Subsidies;***
- ***Toll Differentiation;***
- ***Mandates;***
- ***Blended Finance & Leasing;***
- ***Charging Infra***
- ***EU ETS2;***
- ***Local Production***

Key Take aways for Eastern Europe

Target

Prioritise high-mileage & predictable freight use cases

Cluster

Build fleet + charging clusters around logistics and industrial hubs

Connect

Develop 2–3 priority national and cross-border Green Freight Corridors

Integrate

Embed e-Freight into National e-Mobility + Energy + Grid Planning

De-Risk

Use innovative financing to overcome upfront vehicle and infrastructure costs; de-risk low demand & utilisation

Scale

Move from pilots → aggregated fleet demand → regional corridor networks

Thank you

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