

Electrifying the Medium and Heavy-duty Vehicle Industry

A roundtable dialogue

Date: 19th October 2023



About the Project...

Decarbonising Freight in India

Feasibility of Electrification of MDVs and HDVs

Objectives

- To assess the viability of the transition to electric vehicles in terms of the cost burden on vehicle owners, who are mostly private enterprises, and to assess operational challenges
- To understand the feasibility of electrification of the HDV and MDV vehicle segments on the highways in India. It will analyse gaps in the freight and highway electrification, as well as the existing charging infrastructure's capability
- To strengthen the discourse around introducing policy measures for electrification of the logistics and freight sector in India

Corridor Analysis...

Delhi-Jaipur

STRENGTH

- Adequate number of charging stations
- Readily available Infrastructure support
- Easy connectivity to towns/ cities along the highway
- Proximity to automobile manufacturing hub in Manesar along the highway
- The highway serves as a gateway to Rajasthan – a famous tourist destination
- Advantage of logistics in charging point installation

OPPORTUNITY

- Great scope for capacity expansion – space availability is not a concern
- Multiple partnership opportunities with food and shopping complexes, resorts etc.
- Development of service network
- Demand is not limited to vehicles plying on the highway
- Higher concentration of two-wheelers on the highway

Limitations

- Lack of safety measures
- Operation and maintenance challenges – many charging points were dysfunctional
- Completely automated charging procedure
- Inadequate supporting infrastructure – shading, waiting areas, drinking water facilities etc.
- Location of the charging infra
- Unsatisfactory user interface
- Unregulated tariff structure

THREAT

- High exposure to heat and dust
- Growth rate of charging infrastructure not matching up with EV sales
- Constantly evolving charging technology
- Charging time constraints for commercial vehicle category
- Non-tech savvy (generally commercial) vehicle operators may find the charging process cumbersome

Corridor Analysis...

Delhi-Agra (Yamuna Expressway)

STRENGTH

- Connects two major industrial and tourist hubs
- Better road infrastructure
- Preferred route for vehicles heading from Delhi to Agra
- Government support for developing the expressway into an e-highway
- Connected to other important freight corridor (Agra-Lucknow)
- Uncongested traffic movement

OPPORTUNITY

- Great scope for charging infrastructure development
- Readily available infrastructure support
- Possibility of shifting freight movement from alternate route
- Additional support from tourism
- Economical for transportation of agriculture products

Limitations

- Expressway specifically designed for passenger vehicle movement
- Underdeveloped charging infrastructure along the expressway
- Locating charging stations is a challenge
- Long exit routes to cities along the expressway
- Demand limited to vehicles plying on the expressway
- Unregulated tariff structure

THREAT

- High toll charges can limit the development of freight movement
- Remote location a challenge for development of service network
- Connectivity to grid can be a major issue in some land pockets
- Preference of service provider to install charging points within city limits due to logistical constraints

Corridor Analysis...

Eastern Peripheral Expressway

STRENGTH

- India’s first green and smart highway with modern facilities like Highway Traffic Management System (HTMS) and an intelligent Video Incident Detection System (VIDS)
- Huge potential for charging infrastructure development
- Policy and regulatory support

Limitations

- Absence of charging infrastructure
- Poor accessibility cities along the expressway
- Expressway specifically designed for long distant goods transportation
- Comparatively less traffic movement

OPPORTUNITY

- Development of not just charging infrastructure but whole EV ecosystem
- Land availability and access to power
- Scope for establishing manufacturing units
- Infrastructure specifically designed for heavy duty vehicles

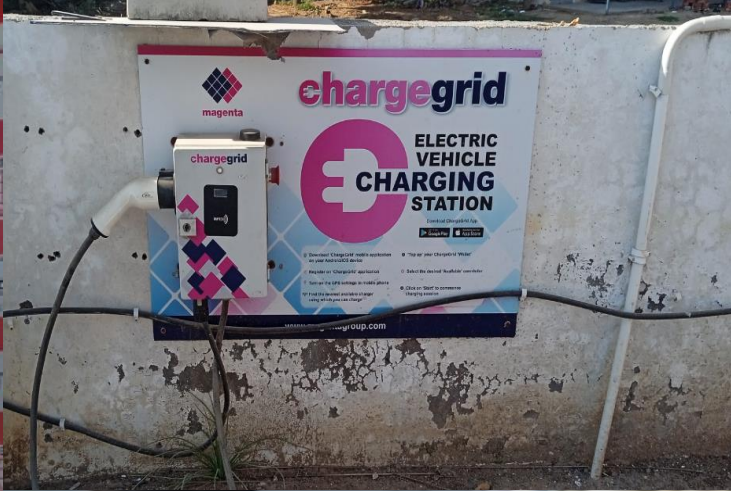
THREAT

- Possibility of investments turning into non-revenue generating assets
- Limited scope for medium duty vehicles
- Unregulated tariff structure as the expressway passes through different states
- Safety concerns for charging infrastructure

Corridor Analysis...



Corridor Analysis...



Trial runs...

Delhi-Jaipur

- Vehicle category - Three wheeler cargo (delivery van)
- Battery capacity - 7.37 kWh
- Battery type - Lithium-ion, 48 V
- Charging time - 3h 50 min (15-18% - 97-98%)
- Range - 80 km
- Top speed - 50 km/hr
- Payload capacity - 500 kg (pick up - 550 kg, flatbed - 578 kg)
- Peak power - 8 kW
- Peak torque - 42 Nm
- Seating capacity – 1
- Max GVW – 995 kg



Trial runs...

Delhi-Jaipur

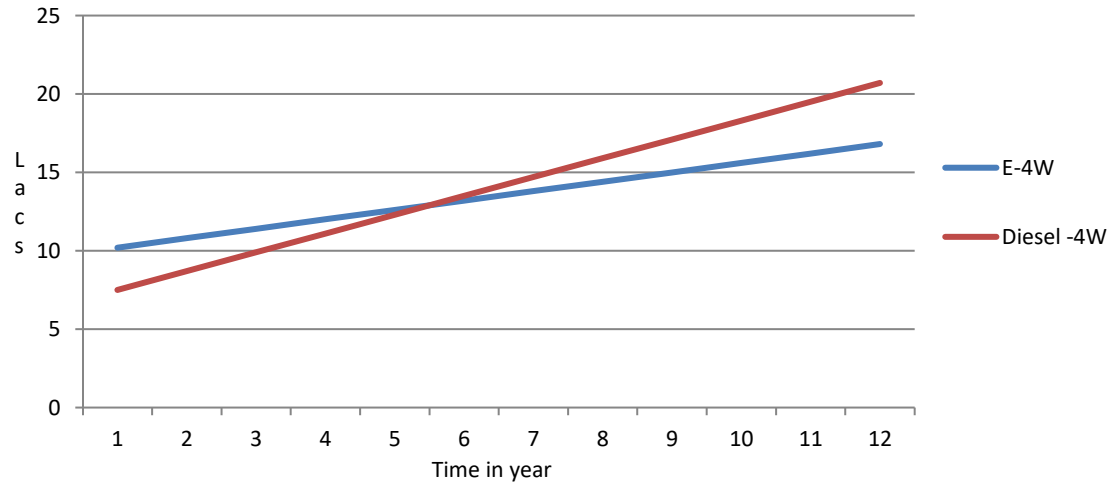
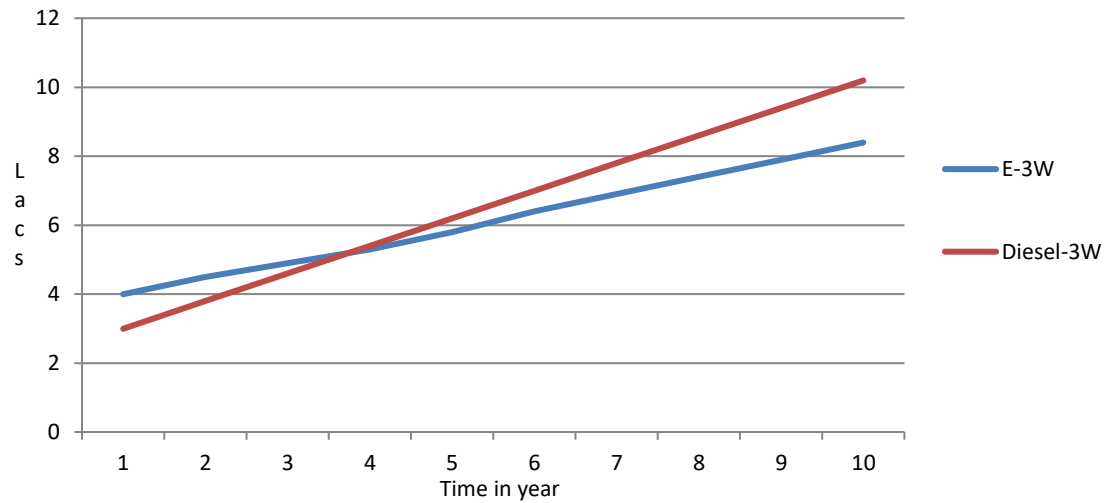
- Vehicle category - Four wheeler cargo (container)
- Battery capacity – 21.3 kWh
- Battery type - LFP, 93 V
- Charging time - 1h 45 min FC (10%-80%), 6-7h NC (20%-100 %)
- Range - 100-120 km*
- Top speed - 60 km/hr
- Payload capacity - 600 kg
- Peak power - 27 kW
- Peak torque - 130 Nm
- Seating capacity - 2
- Max GVW - 1,840 kg



Trial runs...

Analysis

Parameters	Three wheeler	Four wheeler
Total Distance	175 km	192 km
Payload	250 kg	380 kg
Average speed	26 km/hr	37km/hr
Running cost	80 paise/km	1.15 rs/km
Per day mileage	100 km	140 km
Lifecycle of vehicle	10 years	12 years



Carbon reduction potential of ~72,000 tonnes of CO₂

Thank You!