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FUELING ZEV TRANSITION IN TELANGANA

ROLE OF SUPPLY-SIDE POLICIES

REPORT

NOVEMBER 2025

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The authors would like to thank government officials, business leaders and stakeholders for sharing their valuable inputs on supply-side regulations for zero-emission vehicles. We would like to thank our esteemed peer reviewers: Gopalkrishnan VC (Director Automotive, Government of Telangana) Akansha Golcha (Fellow, Chair on India and Emerging Asia Economics, Center for Strategic and International Studies), Vandana Padmanabhan and Laurie Geller (NRDC).

Designed by: Aspire Design, New Delhi

Cover Image: freepik.com

Citation for this report:

Natural Resources Defense Council and Administrative Staff College of India. Fueling ZEV Transition in Telangana: Role of Supply-Side Policies. 2025.

Image source: freepik.com

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Abbreviations

ASCI	Administrative Staff College of India
CAGR	Compound Annual Growth Rate
C.A.S.E.	Connected, Autonomous, Shared & Electric
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2e	Carbon Dioxide equivalent
CO_2	Carbon Dioxide
DTCP	Directorate of Town and Country Planning
EV	Electric Vehicle
FY	Financial Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GHMC	Greater Hyderabad Municipal Corporation
HC	Hydrocarbons
HCV	Heavy Commercial Vehicle
ICE	Internal Combustion Engine
INR	Indian Rupee
LCV	Light Commercial Vehicle
LPG	Liquid Petroleum Gas
MAUD	Municipal Administration and Urban Development
MCV	Medium Commercial Vehicle
MHCV	Medium and Heavy Commercial Vehicle
NRDC	Natural Resources Defense Council
OEM	Original Equipment Manufacturer
T-Hub	Technology Hub
T-Works	Telangana Works
TASK	Telangana Academy for Skill and Knowledge
TCO	Total Cost of Ownership
TGNPDCL	Telangana State Northern Power Distribution Company Limited
TGPCB	Telangana Pollution Control Board
TGREDCO	Telangana State Renewable Energy Development Corporation Limited
TGSPDCL	Telangana State Southern Power Distribution Company Limited
TMV	Telangana Mobility Valley
TGIC	Telangana State Innovation Cell
USD	United States Dollar
We-Hub	Women Entrepreneurs Hub
ZEV	Zero Emission Vehicle

Image source: freepik.com

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1. Introduction

Telangana has emerged as the preferred destination for investors in various sectors, including IT, Electronics, Food Processing, Life Sciences, Aerospace, as well as Logistics and Transportation. Urbanisation and employment opportunities, along with increased migration, have led to higher demand for housing, infrastructure, and transportation, thereby driving the state's gross domestic product (GDP) growth. This surge has led to increased vehicular movement and the associated greenhouse gas (GHG) emissions. The energy sector of Telangana has been a significant contributor to the state's overall emissions, making up approximately 85% of the total GHG emissions, with the transport sector accounting for about 23% of this share.[1] According to the state transport department, on average, there were over 2,500 new vehicles registered daily in FY 2023-24 in Telangana.[2]

This continued rise in vehicle ownership and urbanization has increased the state's reliance on fossil fuels. As a result, the transport sector is the second largest contributor to GHG emissions after public electricity generation, within the energy sector, in Telangana.[1]

The state of Telangana acknowledges that the decarbonization of the transportation sector is a fundamental element in attaining its climate objectives. With this background, the Telangana State Electric Vehicle and Energy Storage Policy, 2020-2030 was launched in September 2020, underlining the state's commitment to a more sustainable and eco-friendly transportation system.[3]

By transitioning to zero-emission vehicles (ZEVs), the state aims to reduce tailpipe emissions from vehicles and thereby providing access to clean environment to its citizens. To complement this further, the state is at the forefront of fostering a robust ecosystem of institutions dedicated to propelling sustainable and collaborative mobility solutions. Anchored by institutions like T-Works (Telangana Works), T-Hub (Technology Hub), We-Hub (Women Entrepreneurs Hub), TASK (Telangana Academy for Skill and Knowledge), and TGIC (Telangana State Innovation Cell), the state has positioned itself as a pioneering hub for cutting-edge initiatives in the field of mobility. Further the state launched India's first mobility focused cluster, the Telangana Mobility Valley (TMV), positioning the state as a hub for sustainable mobility manufacturing, research, skilling, and policy development.

Despite several government-led efforts to address air pollution in Telangana, especially in cities like Hyderabad, the state continues to face serious environmental challenges from rising vehicular emissions. To decarbonize transport, the state introduced supportive policies which were complemented by notable ZEV investments, yet the electric vehicle penetration across most vehicle segments remains limited. This clearly signals the need for stronger supply-side regulations, which can not only reinforce demand-side measures but also offer long-term market certainty and support state's broader environmental goals. In line with this vision, Telangana became the first Indian state to sign the Global Memorandum of Understanding (MoU) with CALSTART's global Drive to Zero program and the Government of the Netherlands on Zero-Emission Medium- and Heavy-Duty Vehicles, demonstrating its leadership and commitment to advancing clean transport.[4] By providing greater policy certainty to industry stakeholders through the establishment of clear ZEV targets, the state can unlock a significant economic opportunity and solidify its leadership in the transition to sustainable mobility.

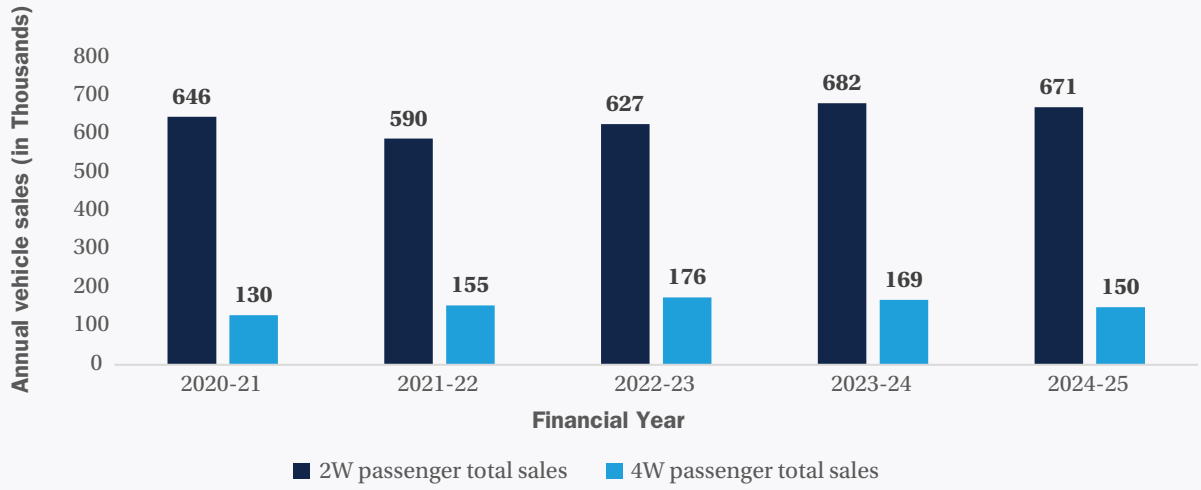
The annual vehicle sales in Telangana increased from 7.07 million in 2014 to 15.4 million in 2023, reflecting an average annual growth rate of 9 percent.

This report outlines Telangana's vehicle ownership trends, various supply-side policies and incentives by the state, their impact on the state's automobile sector, and their role in meeting the state's ambitious environmental and climate targets. The transition to ZEV can be instrumental in achieving these objectives. The term ZEVs in this report refers to battery electric vehicles, fuel-cell electric vehicles and any other alternative technology that results in zero-tailpipe emissions. However, in India, the majority of the clean technology vehicles registered are under the battery electric vehicles category. This report proposes sales-based targets for ZEVs as supply-side regulation operationalised through a credit mechanism. This ZEV regulation could be designed based on the vehicle ownership pattern and automobile manufacturing capability of Telangana. An understanding of which vehicle classes are market-ready is essential for policymakers to design tailored ZEV sales targets that are both ambitious and achievable. This report provides a comprehensive analysis of ZEV sales in the state by OEMs across different vehicle form factors—two-wheelers, three-wheelers (passenger and goods), passenger cars, and light commercial vehicles—which reveals critical insights into market readiness for ZEV sales requirements.

1.1 Vehicular stocks, annual sales in Telangana

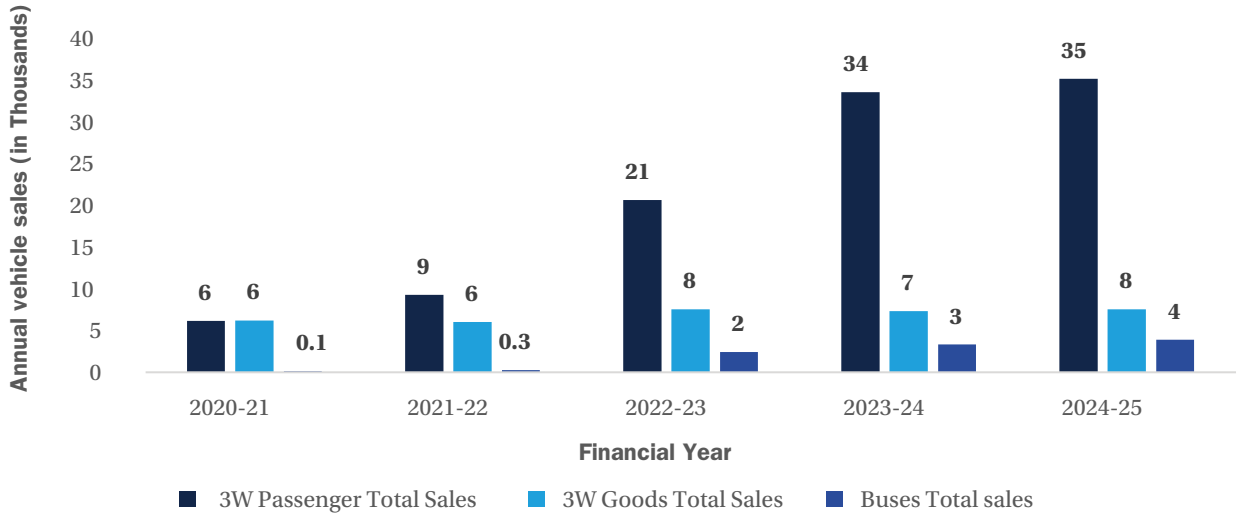
Telangana has witnessed rapid growth in vehicle sales over the years, driven by urbanization, rising incomes, and the expanding reach of transportation networks. In the last ten years, The annual vehicle sales in Telangana increased from 7.07 million in 2014 to 15.4 million in 2023, reflecting an average annual growth rate of 9 percent. Notably, during FY 2022-23, approximately one million new vehicles were introduced within the state. If we look at Hyderabad alone, the city had a mere 2.5 million vehicles at the time of the formation of Telangana. This number has consistently grown to roughly 7 million, with more than 5 million being two-wheelers and approximately 1.3 million being four-wheelers.[5]

Figure 1: Two-wheeler and Four-wheeler Passenger Annual Vehicle Sales in Telangana from FY 2020-21 to FY 2024-25



Source: ASCI-NRDC Analysis

Figure 2:Three-Wheeler Passenger, Three-Wheeler Goods, Four-Wheeler Cabs and Buses Annual Vehicle Sales in Telangana from FY 2020-21 to FY 2024-25

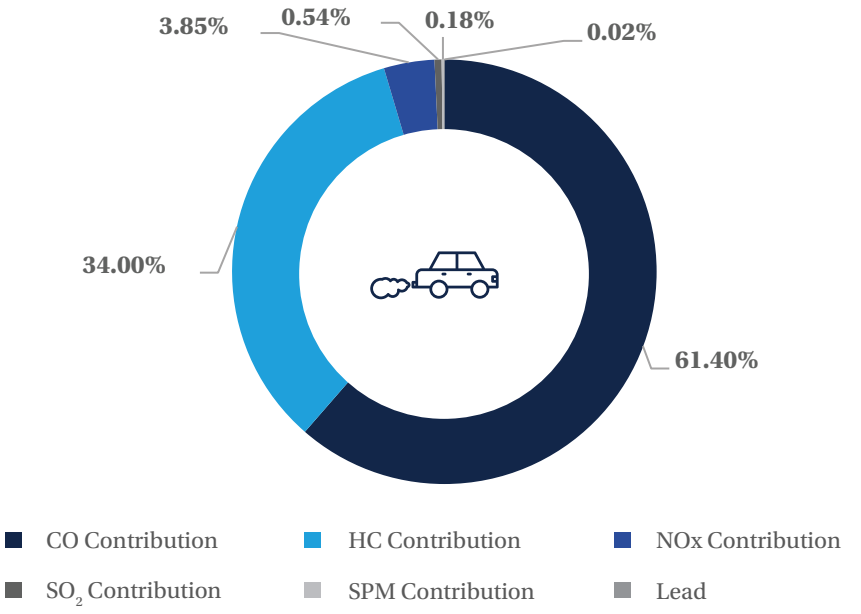


Source: ASCI-NRDC Analysis

Over the past decade, the two-wheelers have continued to dominate the market in Telangana with over 80% of annual vehicle sales. This dependency on two-wheelers among the population, similar to any other Indian city, could be attributed to its convenience and cost-effectiveness, which makes it ideal for use. The rapid increase in vehicle sales has been accompanied by rising concerns over the growing vehicular emissions.

Vehicular emissions are a significant contributor to urban air pollution in Telangana, particularly in urban areas like Hyderabad and Secunderabad. As of 2018, Telangana's transport sector alone contributed 23% of the state's energy sector emission, accounting for 13.18 Mt CO_2e.[1] The primary contributors of pollution among vehicle categories in the state are carbon monoxide (CO) and hydrocarbons accounting for more than 95% of the total emissions, as presented in the figure below.[6]

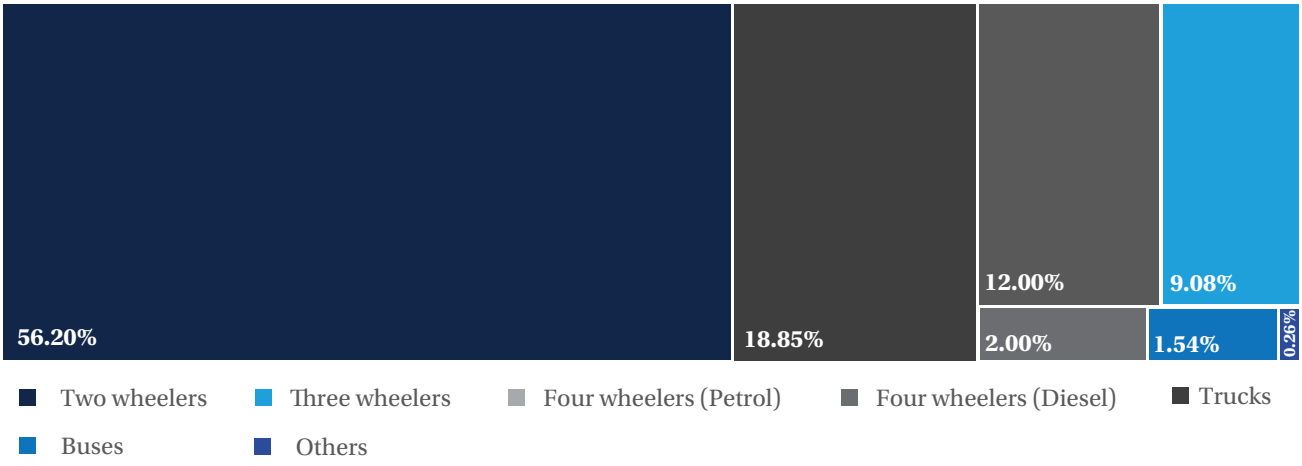
Figure 3: Vehicular Pollution Load Distribution in Telangana



Source: Transport Department of Telangana

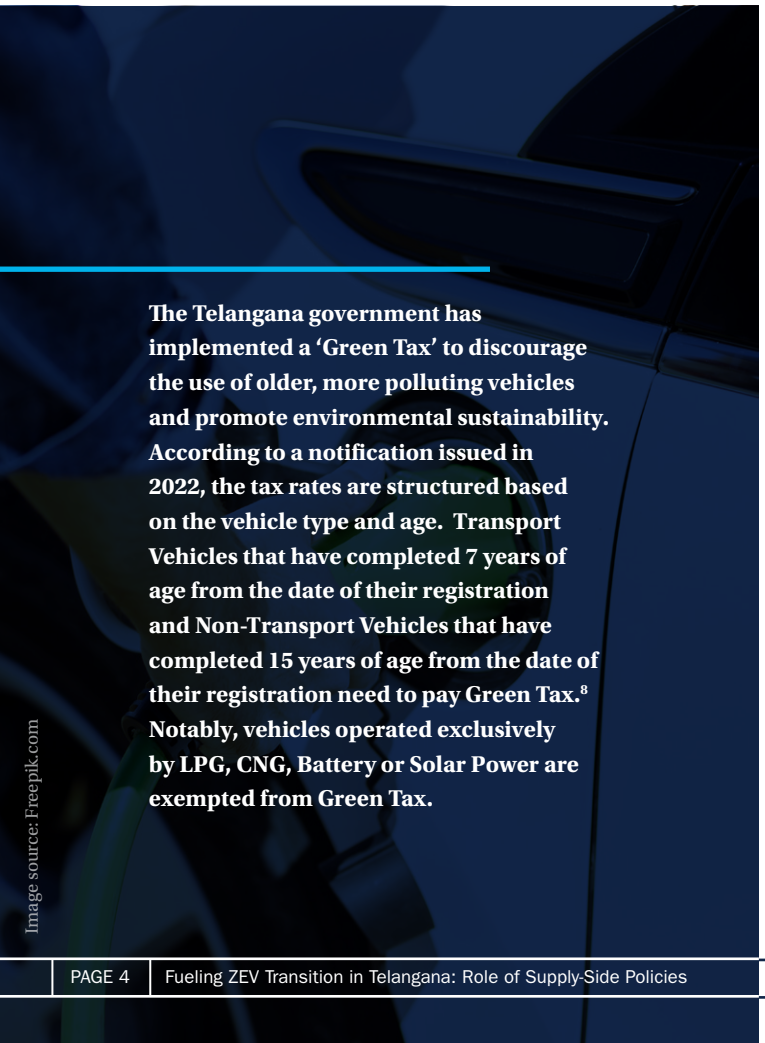
Over the past decade, the two-wheelers have continued to dominate the market in Telangana with over 80% of annual vehicle sales.

Figure 4: Contribution of Different Vehicle Segments to Air Pollution in Telangana



Source: Transport Department of Telangana

The breakdown of segment-wise vehicular emissions contributing to state emissions is as shown in the figure above. Two-wheelers and medium and heavy commercial vehicles in the state contribute to three-quarters of the pollution load, followed by four-wheelers with over 20% of the air pollution.[6] In the four-wheeler segment, the petrol variants account for six times more pollution load than the diesel vehicles, primarily because they are significantly higher in number on the road as compared to diesel ones. This highlights the need for state to focus on its climate action plans and targets to prioritize interventions to effectively curb emissions.



The Telangana government has implemented a 'Green Tax' to discourage the use of older, more polluting vehicles and promote environmental sustainability. According to a notification issued in 2022, the tax rates are structured based on the vehicle type and age. Transport Vehicles that have completed 7 years of age from the date of their registration and Non-Transport Vehicles that have completed 15 years of age from the date of their registration need to pay Green Tax.[8] Notably, vehicles operated exclusively by LPG, CNG, Battery or Solar Power are exempted from Green Tax.

Image source: Freepik.com

1.1.1 Meeting State Level Climate Change Action Plan and Net Zero Target

Addressing the emissions is essential not only for environmental sustainability but also for improving public health and fostering economic resilience. The state has outlined its goals in the State Level Action Plan on Climate Change and Human Health: 2022-27, to reach Net Zero emissions by 2047, aligning with the centenary of India's independence.[7] This target is 23 years ahead of the national goal of 2070, reflecting the state's proactive approach to climate action. Increasing the sales of zero-emission vehicles (ZEVs) in Telangana is a critical step in the state's journey towards decarbonizing transport. The roadmap for this transition is expected to be finalized by mid-2025, which would involve initiatives like promoting ZEV sales as a foundational step towards this goal.[7]

1.2 Revenue from State Transport Sector

The revenue generated from registration fees, life tax, quarterly tax, and green tax by the Transport Department has witnessed a steady increase, with a compound annual growth rate (CAGR) of 17.13% from 2018-2019 to 2023-2024.[2] Notably, from 2021-2022 to 2023-2024, the revenue growth accelerated, with a CAGR of 34.65%, culminating in a total of INR 6,182 Crore (USD 725 Million) in the most recent financial year (FY 23-24).[2] The significant surge in revenue from 2022-2023 onwards can largely be attributed to the rigorous enforcement of the green tax policy, which has contributed to this substantial increase.

While the surge in vehicles, contributes to improved mobility and economic growth in Telangana, it has also exacerbated challenges related to air quality and environmental sustainability.

2. ZEV Adoption in Telangana: Conceptualizing Supply-Side Regulations for the State

Telangana is emerging as a significant hub in India's automotive landscape, driven by strategic initiatives and substantial investments in both traditional and electric vehicle sectors. The ZEV ecosystem has witnessed a significant rise in investments from both OEMs and component manufacturers in the state. Major companies have established manufacturing facilities and substantial investments were made in battery manufacturing, and supporting charging infrastructure facilities, along with other smart mobility services. Furthermore, the state has a vision to set up testing and certification centres, to support the development and validation of ZEV technologies in Telangana. To facilitate ZEV and its components manufacturing in the state, Telangana has outlined several supply-side policy measures as discussed in the next section.

2.1 Telangana's Supply-Side Incentives for ZEV Manufacturing and Sales

To support its vision of becoming a global leader in electric mobility, Telangana has introduced a range of supply-side policies designed to attract investments across the value chain and promote the growth of the ZEV manufacturing sector. These policies focus on various aspects of the ZEV ecosystem, including the production of electric vehicles, batteries, components, and infrastructure. In October 2020, the State Government rolled out a 10-year Electric Vehicle and Energy Storage Systems (EV & ESS) Policy 2020-2030 with the aim to attract USD 4 billion investments.[3] The policy aims to make the state a hub for ZEVs and energy storage systems along with creating employment opportunities for 1,20,000 people through shared mobility, charging infrastructure development, and manufacturing.[4] The policy focuses on enhancing ZEV ecosystem through initiatives like the Telangana Mobility Valley (TMV), which represents the state's long-term strategic plan to develop India's largest end-to-end ecosystem for C.A.S.E. (Connected, Autonomous, Shared & Electric) Mobility for transforming urban mobility and reducing dependence on fossil fuels. The TMV aims to establish a comprehensive, efficient, and sustainable transportation network in Telangana. Key initiatives under TMV are Electrification of Public Transport, Infrastructure Development, and Public-Private Partnerships. It brings together industry stakeholders, research institutions, and government bodies to drive innovation, research, and manufacturing in the ZEV space.[9]

The revenue growth accelerated, with a
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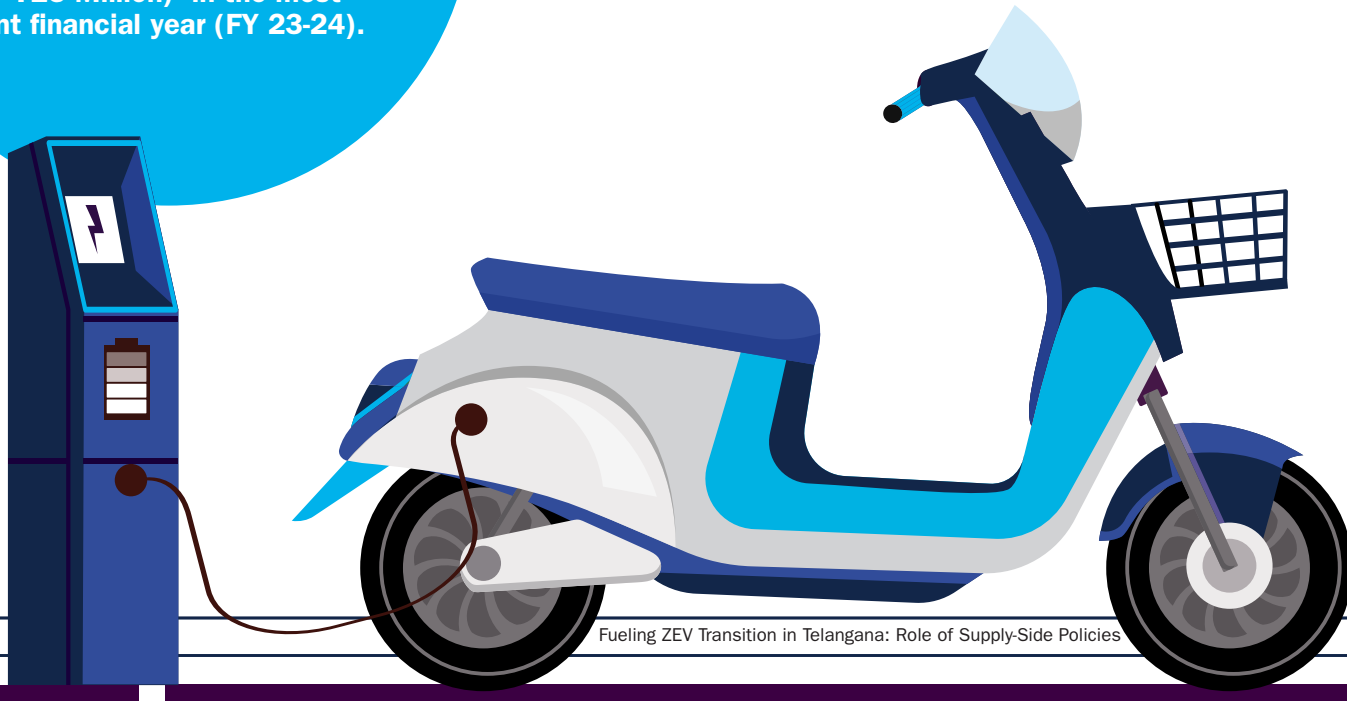


Telangana has witnessed a sharp rise in ZEV registrations post-policy launch, with a CAGR of 125% over the last 5 years.

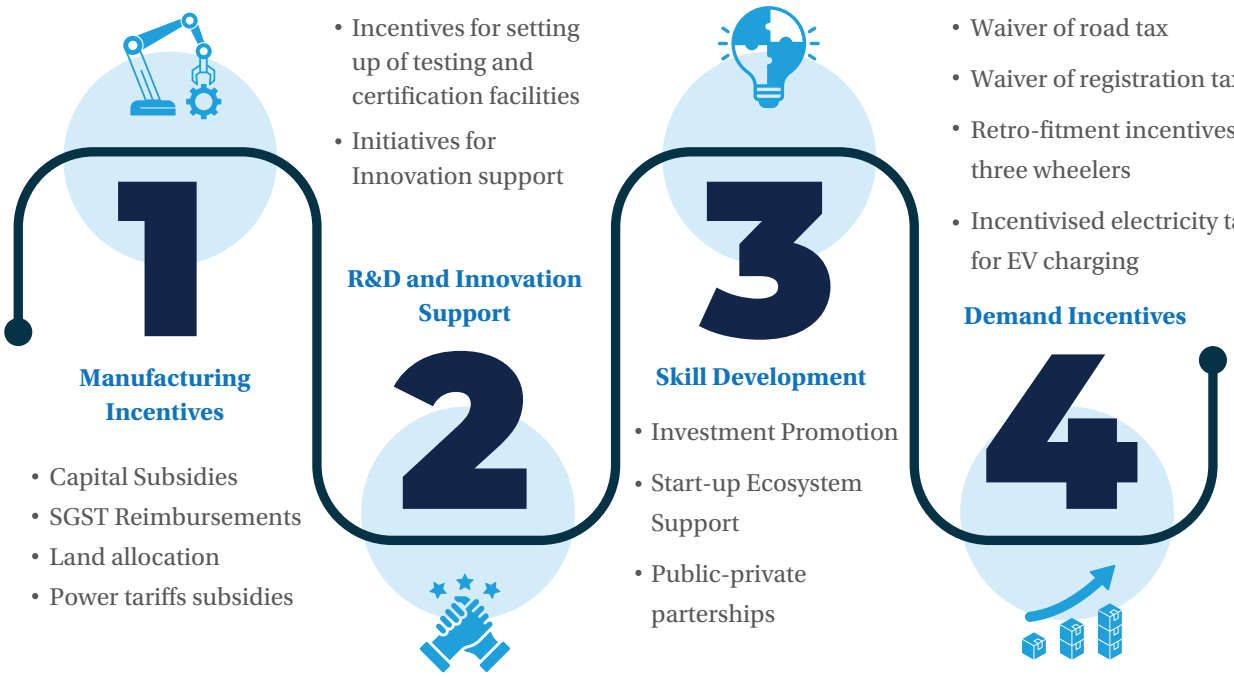
TMV is aiming to scale-up five pillars - Manufacturing, Engineering, Innovation & R&D, Skilling and Testing & Validation Labs. With TMV, Telangana is expecting investments worth over INR 50,000 Crore (USD 5.8 Billion) that would generate over 400,000 jobs by 2030.[10]

2.2 Telangana's Policies Supporting ZEV Adoption

Telangana's commitment to promoting sustainable mobility is reflected in its electric vehicle (EV) and energy storage system (ESS) policy, through which the state is paving the way for a greener and more sustainable electric mobility future. ESS will be pivotal in enabling vehicle-to-grid technology, allowing ZEVs to support the grid by storing and discharging electricity when needed.

The supply-side incentives for the ZEV sector are provided under the "Telangana Electric Vehicle and Energy Storage Policy (2020-2030)", Telangana Mobility Valley, and Electronics Policy 2016 to attract both domestic and international OEMs, ZEV charger manufacturers, component manufacturers, encouraging backward integration and localization of ZEV components. The incentives provided through the policy are designed to make Telangana an attractive destination for ZEV manufacturing and to promote sustainable and clean mobility solutions. Despite these state led efforts, measures are required to further accelerate ZEV adoption. Building on this foundation, it is essential to examine the current trends in ZEV growth within the state and identify areas where targeted interventions can enhance adoption and scale.

Figure 5. Types of Supply Side Incentives for ZEV Manufacturing in Telangana

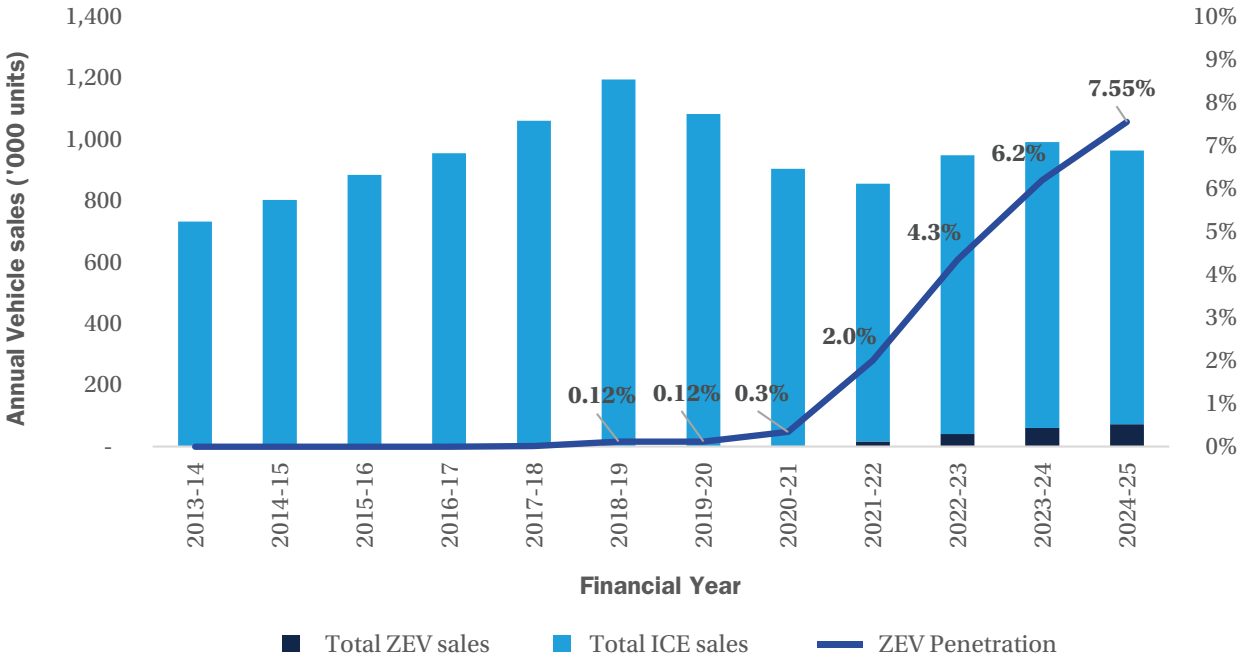


Source: Telangana State Electric Vehicle and Energy Storage Policy. 2020-2030

2.3 Growth of Zero Emission Vehicles in Telangana

Through targeted incentives for vehicle buyers and manufacturers, the state has stimulated ZEV adoption, particularly in two-wheelers, three-wheelers, and public transport fleets. The state's strategic initiatives have catalysed a shift towards sustainable mobility, with tangible outcomes observed since the policy's launch.

Figure 6: Annual Vehicle Sales in Telangana from FY 2013-14 to FY 2024-25



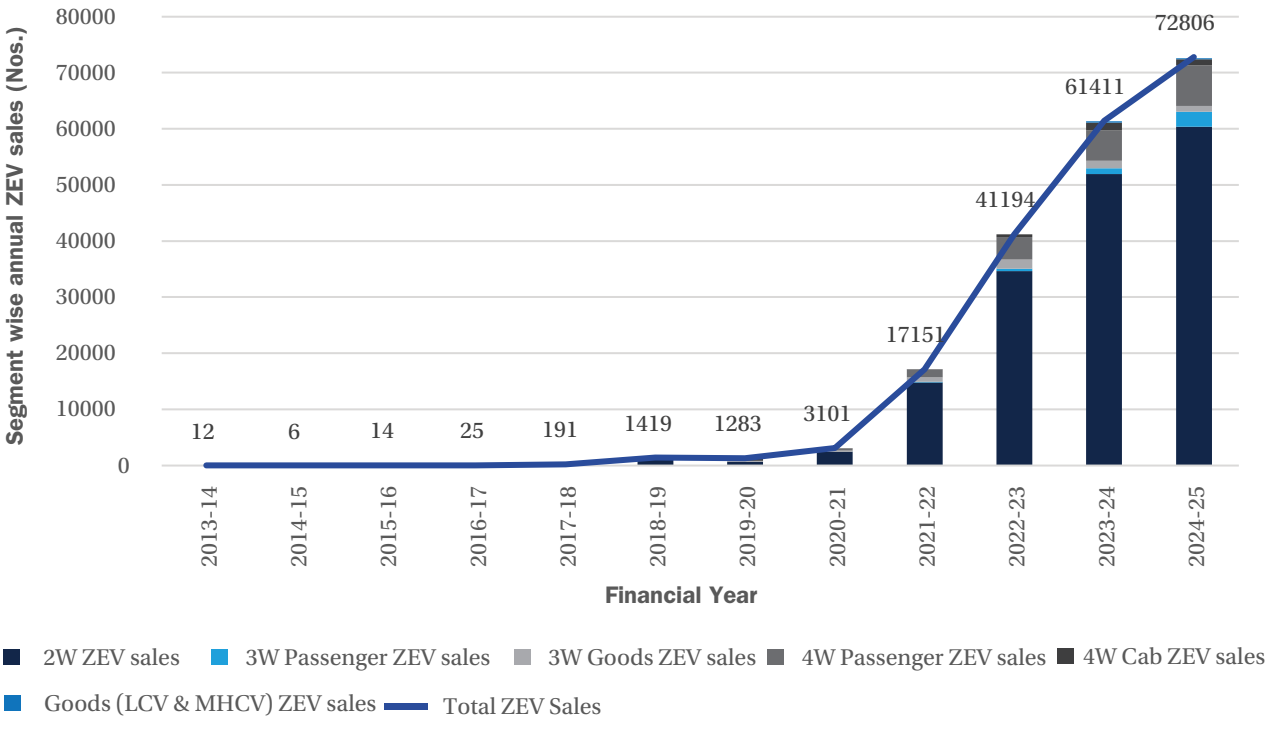
*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

In the last decade, Telangana witnessed the highest vehicle sales during the period from 2017 and 2020. Amidst the COVID-19 crisis, the sales declined but have since recovered. ZEV adoption has witnessed strong growth driven by increasing customer acceptability. The adoption of ZEVs has seen significant growth across all vehicle segments in the past few years, as presented in figure below, driven by subsidies and tax exemptions. Telangana has witnessed a sharp rise in ZEV registrations post-policy launch, with a CAGR of 125% over the last 5 years.[2,11]

Telangana has witnessed a sharp rise in ZEV registrations post-policy launch, with a CAGR of 125% over the last 5 years.

Figure 7: Segment-wise ZEV Sales in Telangana from FY 2013-14 to FY 2024-25

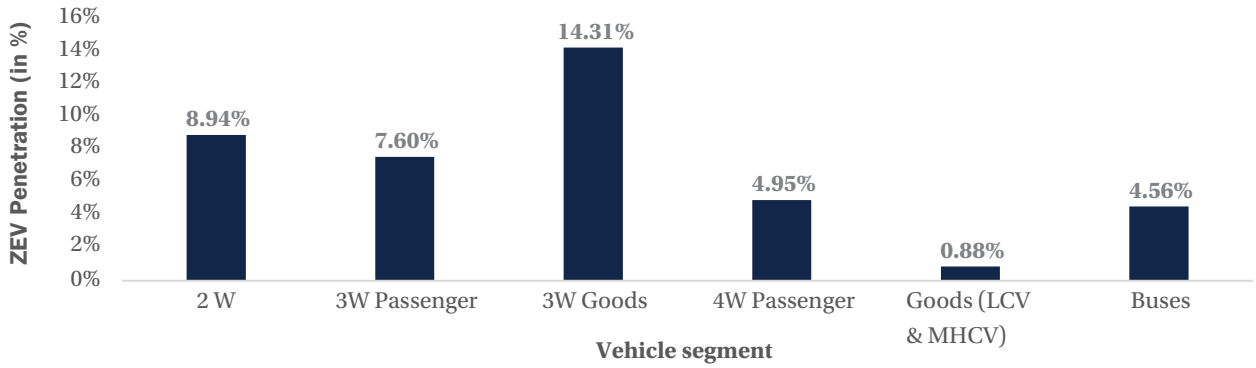


*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

Two-wheelers, have seen the most notable expansion in sales recording a 147% CAGR over the last 5 years. The ZEV penetration across different vehicle segments in Telangana for the fiscal year 2024–2025, as shown in the figure below, highlights a notable variation, shaped by both national trends and local dynamics. Electric three-wheelers (3Ws) show the highest levels of adoption, with a penetration rate of 14.31% in the goods segment and 7.60% in the passenger segment. This strong performance is largely driven by favourable cost economics and growing demand for efficient last-mile connectivity. Electric two-wheelers (2Ws) follow closely, achieving an 8.94% penetration rate, supported by their affordability, convenience for urban commute, and lower operating costs.

Figure 8: Vehicle Segment-wise ZEV Penetration for FY 2024-25 in Telangana



*Note: Here, ZEV includes Battery Electric Vehicles only.
Source: ASCI-NRDC Analysis

The four-wheeler passenger and goods vehicle categories have lower penetration rates due to high upfront cost and limited availability of affordable ZEV models. Therefore, it is essential to analyse OEM's vehicle sales across vehicle segments to provide better visibility on which vehicle segments are ready and which other vehicle segments would require more lead time for the implementation of supply-side regulations.

Electric three-wheelers (3Ws) show the highest levels of adoption, with a penetration rate of 14.31% in the goods segment and 7.60% in the passenger segment.

2.3.1 Future Vehicle Growth Scenario for Telangana

As the state continues to develop its infrastructure and enhance its industrial base, vehicle ownership is expected to rise steadily. In the financial year 2024-2025, Telangana witnessed total annual sales of around 9.63 Lakh vehicles. Based on the Compounded Annual Growth Rate (CAGR) calculated over the past 10 years, vehicle sales are projected to reach a total of 1.07 million (10.73 Lakhs) by 2030.[12]

Based on the projected vehicle registrations for Telangana in 2030, it is important to evaluate a more ambitious transition pathway consistent with national-level goals. As highlighted in a NITI Aayog report, successful implementation of the FAME II scheme and other supporting measures could enable India to reach EV sales penetration of 30% in private cars, 70% in commercial cars, 40% in buses, and 80% in two- and three-wheelers by 2030.[13]

Applying these ZEV penetration targets to Telangana's projected vehicle sales for 2030 indicates the state would need around 10 lakh ZEV registrations, as detailed in Table 1. The estimated ZEV numbers across vehicle categories were calculated by distributing the total projected 2030 registrations in line with the segment distribution recorded in FY 2024–25.

Table 1: Estimated Electric Vehicle Sales across Different Vehicle Categories in Telangana (FY 2030-31)

Years	2W Sales	3W Passenger Sales	3W Goods Sales	4W Passenger Sales	Goods carriage (LCV) Sales	Buses Sales
2013-2014	5,57,369	27,306	4,416	89,363	11,539	1,784
2023-2024	6,83,950	33,572	7,346	1,87,672	19,383	3,326
2024-2025	6,74,799	35,164	7,534	1,67,513	19,547	3,926
2030-2031*	7,08,535	37,900	9,236	2,36,163	29,974	6,304
EV Goals	80%	80%	80%	30%	70%	40%
EV Sales	**5,66,828**	**30,320**	**7,389**	**70,849**	**20,982**	**2,522**

*Projected with CAGR from last 10 years of data
Source: ASCI-NRDC Analysis

This surge in vehicle sales should be directed towards sustainable mobility and state needs to focus on growth of ZEV market and transition into cleaner and efficient transportation options.

2.3.2 ZEV Adoption and Market Dynamics in Telangana's Automobile Sector

Driving the transition to zero-emission vehicles (ZEVs) depends primarily on the availability of ZEV models that can match the performance and price of internal combustion engine (ICE) vehicles, along with the robust development of supporting ZEV charging infrastructure. Policies and regulations play a critical role in this shift, as they provide the market certainty needed for investment decisions by Original Equipment Manufacturers (OEMs), creating a long-term value for all stakeholders. More importantly, this transition has the potential to significantly improve the quality of life for citizens by reducing air pollution and lowering their daily exposure to harmful emissions.

The following section delves into OEM-wise vehicle sales across different form factors, offering insights into trends, market share and increasing penetration of electric mobility in state's automotive ecosystem. Therefore, it is essential to understand which categories are better positioned to respond to supply-side regulations and where additional demand-side incentives may still be required to accelerate market development.

The ZEV penetration in two-wheeler category stood at 8.94% with over 60,000 sales of electric two-wheelers.

Two Wheelers:

In Telangana, the two-wheeler segment dominated with over 70% of total vehicle sales in FY 2024-25. The ZEV penetration in this category stood at 8.94% with over 60,000 sales of electric two-wheelers. The price gap between the ZEV models and ICE vehicles in the two-wheeler segment is narrowing and the TCO of e-2W is over 50% lower than its ICE counterpart which has led to increasing adoption of e-2W in the e-commerce and logistics sector, as well as for personal use.[5]

- Traditional OEMs like Honda, TVS, Bajaj, and Hero dominated the 2-wheeler segment in Telangana, collectively holding over 75% of the market share
- TVS leads among traditional OEMs in ZEV penetration with 14% of sales being ZEV. Bajaj and Hero follow with ZEV sales shares of 8.29% and 2.2% respectively.
- Ola Electric and Ather Energy have together captured 4% of the total 2W market share.

Table 2: ZEV and ICE Sales by Two-Wheeler OEMs in Telangana in FY 2024-25

Two-Wheeler Sales in Telangana in FY 2024-25						
Sl. No	**Name of OEM**	**ICE Sales**	**ZEV Sales**	**Total Sales**	**% Market Share**	**ZEV Sales as % of total Vehicle Sales by OEM**
1	Honda Motorcycle & Scooter(I) Pvt Ltd	234,588	60	234,648	34.77%	0.03%
2	TVS Motor Company Ltd	92,026	14,994	107,020	15.86%	14.01%
3	Bajaj Auto Ltd	87,797	7,937	95,734	14.19%	8.29%
4	Hero Motocorp Ltd	91,883	2,066	93,949	13.92%	2.20%
5	Suzuki Motorcycle (I) Pvt. Ltd	50,855	0	50,855	7.54%	0%
6	Royal Enfield	32,847	0	32,847	4.87%	0%
7	India Yamaha Motor Pvt. Ltd	18,855	0	18,855	2.79%	0%
8	Ola Electric Technologies Pvt. Ltd	0	15,193	15,193	2.25%	100.00%
9	Ather Energy Pvt. Ltd	0	10,390	10,390	1.54%	100.00%
10	Classic Legends Pvt. Ltd	2,435	0	2,435	0.36%	0%
11	Others	9,710	3,163	12,873	1.91%	78.96%
TOTAL		**614,449**	**60,350**	**674,799**	**100%**	**8.94%**

*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

The growing competitive dynamic between emerging ZEV-focused OEMs and established ICE players reflects that market is quickly evolving. The two-wheelers already demonstrate favorable unit economics and technological readiness for electrification, positioning this segment as a strong candidate for supply-side regulations, ssuch as setting sales requirements for OEMs. These regulations could support two-wheeler OEMs to accelerate broader market transformation.

Three-Wheeler Passenger Vehicle:

Over 35,000 passenger auto-rickshaws were sold in Telangana in FY 2024-25. The ZEV penetration in this segment was 7.6%.

Auto-rickshaws play a critical role as the backbone of first- and last-mile connectivity, especially in supporting public transport systems by bridging gaps in accessibility. Over 35,000 passenger auto-rickshaws were sold in Telangana in FY 2024-25. The ZEV penetration in this segment was 7.6%. Due to the restriction in the number of permits, there are around 92,000 auto-rickshaws in the Greater Hyderabad Municipal Corporation limits.[14]

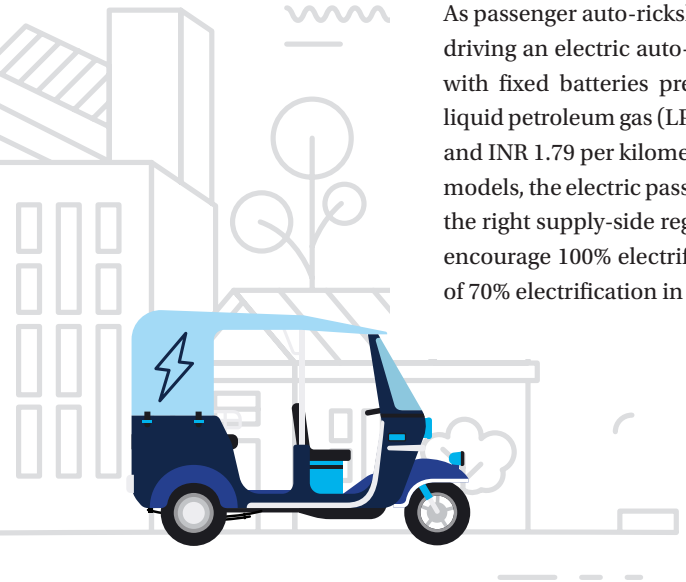
- Bajaj Auto dominated the 3-wheeler passenger segment in Telangana with a 90% market share, driven by its strong ICE portfolio and established distribution.
- Mahindra Last Mile Mobility (91.9% of its sales ZEVs) and TI Clean Mobility (100% ZEVs) are having significant ZEV penetration in their total sales.

Table 3: ZEV and ICE Sales by Three-Wheeler Passenger Auto-Rickshaw OEMs in Telangana in FY 2024-25

Three-Wheeler Passenger Auto-Rickshaw Sales in Telangana in FY 2024-25						
Sl. No	Name of OEM	ICE Sales	ZEV Sales	Total Sales	% Market Share	ZEV Sales as % of total Vehicle Sales by OEM
1	Bajaj Auto Ltd	29,961	1,767	31,728	90.23%	5.57%
2	Piaggio Vehicles Pvt. Ltd	1,266	292	1,558	4.43%	18.74%
3	TVS Motor Company Ltd	1,051	8	1,059	3.01%	0.76%
4	Mahindra Last Mile Mobility Ltd	26	293	319	0.91%	91.85%
5	Ti Clean Mobility Pvt. Ltd	0	230	230	0.65%	100.00%
6	MLR Auto Ltd	113	0	113	0.32%	0%
7	Atul Auto Ltd	75	24	99	0.28%	24.24%
8	Omega Seiki Pvt. Ltd	0	35	35	0.10%	100.00%
9	Reddy Automotive Pvt. Ltd	0	22	22	0.06%	100.00%
10	Euler Motors Pvt. Ltd	0	1	1	0.00%	100.00%
TOTAL		**32,492**	**2,672**	**35,164**	**100.00%**	**7.60%**

*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis



As passenger auto-rickshaws travel a daily distance of more than 100 km, the fuel cost savings from driving an electric auto-rickshaw significantly offset the high upfront cost. Electric three wheelers with fixed batteries present the most cost-effective scenario for three-wheeler, outperforming liquid petroleum gas (LPG) and compressed natural gas (CNG) models with a difference of INR 0.47 and INR 1.79 per kilometer, respectively.[5] Given that many OEMs in this category already offer ZEV models, the electric passenger rickshaw segment can achieve accelerated ZEV penetration rate with the right supply-side regulations in a short period. The government could also leverage permits to encourage 100% electrification of passenger rickshaws, aligning with NITI Aayog's national target of 70% electrification in the three-wheeler segment.

Three-Wheeler Goods Vehicle:

Due to rising demand from the e-commerce and logistics sector, the e-3W goods segment is witnessing surge in ZEV sales. In FY 2024-25, a total of 7,534 three-wheeler goods vehicles were sold in Telangana with the highest ZEV penetration rate of over 14% among all the vehicle segments in the state.

- Bajaj Auto Ltd. and Piaggio Vehicles Pvt. Ltd. hold a combined market share of over 87% of sales, however the ZEV penetration rate in their 3W goods vehicle sales is 6.1% and 2.9% respectively.
- Several OEMs like Euler Motors, Altigreen, Keto Motors, Omega Seiki, and Gayam Motor Works reported 100% ZEV sales, showing a strong focus on ZEVs for transportation of goods in the state.
- However, their combined market share is small, approximately 6.6%, indicating an early-stage presence.

Table 4: ZEV and ICE Sales by Three-Wheeler Goods Vehicle OEMs in Telangana in FY 2024-25

Three-Wheeler Goods Vehicle Sales in Telangana in FY 2024-25						
Sl. No	**Name of OEM**	**ICE Sales**	**ZEV Sales**	**Total Sales**	**% Market Share**	**ZEV Sales as % of total Vehicle Sales by OEM**
1	Bajaj Auto Ltd.	3,876	252	4,128	54.79%	6.10%
2	Piaggio Vehicles Pvt. Ltd.	2,434	73	2,507	33.28%	2.91%
3	Mahindra Last Mile Mobility Ltd.	75	326	401	5.32%	81.30%
4	Euler Motors Pvt. Ltd.	0	192	192	2.55%	100.00%
5	Altigreen Propulsion Labs Pvt. Ltd.	0	96	96	1.27%	100.00%
6	Keto Motors Pvt. Ltd.	0	67	67	0.89%	100.00%
7	MLR Auto Ltd.	62	1	63	0.84%	1.59%
8	Omega Seiki Pvt. Ltd.	0	52	52	0.69%	100.00%
9	Gayam Motor Works (P) Ltd.	0	18	18	0.24%	100.00%
10	Atul Auto Ltd.	7	0	7	0.09%	0%
11	Others	2	1	3	0.04%	33.33%
TOTAL		**6,456**	**1,078**	**7,534**	**100%**	**14.31%**

*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

While growing sales in this vehicle segment could be attributed to the increasing logistics service providers transitioning to ZEVs, electric three-wheelers with swappable batteries in the goods segment offer the most cost-effective solution, presenting the lowest TCO of INR 4.55 per kilometer along with the lowest upfront purchase cost.[6] Therefore, a ZEV sales requirement for the e-3W goods vehicle segment could unlock mass adoption.

Image source: Euler Motors

In FY 2024-25, a total of 7,534 three-wheeler goods vehicles were sold in Telangana with the highest ZEV penetration rate of over 14% among all the vehicle segments in the state.

Four-Wheeler Passenger Vehicle (Cabs and Cars):

In Telangana, the four-wheeler passenger vehicle category has the second highest number of vehicles sales of 1,67,513 in FY 2024-25 with a ZEV penetration of 4.95%

In Telangana, the four-wheeler passenger vehicle category has the second highest number of vehicles sales of 1,67,513 in FY 2024-25 with a ZEV penetration of 4.95%. In personal use cases, the relatively low daily driving distances lead to lower the savings in operating costs that are not enough to offset the higher upfront purchase costs of ZEVs. However, electrification in the four-wheeler segment is steadily on the rise, and Hyderabad has also witnessed the emergence of new age, all-electric ride-sharing companies, signaling a shift in urban mobility preferences.

- Maruti Suzuki dominated with 34% market share, however there were no ZEVs sold by this OEM.
- Tata Motors emerged as a strong ZEV player, with 13% of its total sales being electric, contributing significantly to overall market with share of 17% sales in the state.
- MG Motor India stood out for its ZEV focus, with over 64% of its total sales being electric vehicles, reflecting its strategic push towards new energy vehicles (NEVs).
- While most major OEMs like Hyundai, Mahindra, and Kia have begun ZEV integration, their ZEV models account for less than 5% of their respective annual vehicle sales.

Table 5: ZEV and ICE Sales by Four-Wheeler Car OEMs in Telangana in FY 2024-25

Four-Wheeler Passenger Car Sales in Telangana in FY 2024-25						
Sl. No	Name of OEM	ICE Sales	ZEV Sales	Total Sales	% Market Share	ZEV Sales as % of total Vehicle Sales by OEM
1	Maruti Suzuki India Ltd	56,907	0	56,907	33.97%	0%
2	Tata Motors Ltd	24,751	3,755	28,506	17.02%	13.17%
3	Hyundai Motor India Ltd	21,298	244	21,542	12.86%	1.13%
4	Mahindra & Mahindra	17,123	692	17,815	10.63%	3.88%
5	M/S. Kia India Pvt Ltd	11,805	44	11,849	7.07%	0.37%
6	Toyota Kirloskar Motor Pvt. Ltd	11,177	0	11,177	6.67%	0%
7	Skoda Auto Volkswagen India Pvt Ltd	5,351	0	5,351	3.19%	0%
8	Mg Motor India Pvt. Ltd	1,453	2,610	4,063	2.43%	64.24%
9	Renault Nissan Automotive India Pvt. Ltd.	3,328	0	3,328	1.99%	0%
10	Honda Cars India Ltd	3,035	0	3,035	1.81%	0%
11	Others	2994	946	3,940	2.35%	24.21%
TOTAL		**159,222**	**8,291**	**167,513**	**100%**	**4.95%**

*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

The data indicates that although ICE vehicles still lead the market in the 4W passenger vehicle category, there is a rising consumer demand for electric cars. However, Total Cost of Ownership (TCO) analysis suggests that the 4W segment may need more lead time to fully transition compared to others. While early adopters are being encouraged to go fully electric through demand-side initiatives, introducing supply-side measures can help overcome key barriers by improving model availability, affordability, and driving investments in ZEV charging infrastructure.

Buses:

With over 3,900 buses sold in Telangana in FY 2024-25, the ZEV penetration rate in this category stood at a modest 5%.[2,15] Under the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME India) phase II scheme, 300 electric buses were allocated for Telangana.[16] Under the recent PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) scheme, 2000 e-buses have been allocated to the city of Hyderabad.[17] The Telangana State Road

Transport Corporation (TGSRTC) has set a goal to operate 100% e-buses in the Greater Hyderabad Municipal Corporation (GHMC) region by the end of 2025.[18] While demand aggregation and fiscal incentives have spurred the e-bus market for the state transport utilities (STUs), electrification of private buses is yet to gain traction.

- The top three manufacturers, SML Isuzu Ltd, VE Commercial Vehicles Ltd and Tata Motors Ltd dominate with 73% of market share, indicating significant concentration among established players.
- Traditional ICE buses dominate with 95% market share in the state, while e-buses represent only 5% of sales, exclusively from Olectra Greentech which maintains a local manufacturing presence in Telangana.

With over 3,900 buses sold in Telangana in FY 2024-25, the ZEV penetration rate in this category stood at a modest 5%.

Table 6: ZEV and ICE Sales by Bus OEMs in Telangana in FY 2024-25

Bus Sales in Telangana in FY 2024-25						
Sl. No	Name of OEM	ICE Sales	ZEV Sales	Total Sales	% Market Share	ZEV Sales as % of total Vehicle Sales by OEM
1	SML Isuzu Ltd	1,092	0	1,092	27.81%	0%
2	VE Commercial Vehicles Ltd	1,002	0	1,002	25.52%	0%
3	Tata Motors Ltd	757	0	757	19.28%	0%
4	Ashok Leyland Ltd	443	0	443	11.28%	0%
5	Force Motors Ltd	270	0	270	6.88%	0%
6	Olectra Greentech Ltd	0	179	179	4.56%	100.00%
7	Mahindra & Mahindra Ltd	139	0	139	3.54%	0%
8	Daimler(I)Commercial Vehicle Pvt Ltd	44	0	44	1.12%	0%
TOTAL		**3,747**	**179**	**3,926**	**100%**	**5%**

*Note: Here, ZEV includes Battery Electric Vehicles only.

Source: ASCI-NRDC Analysis

To enable the holistic decarbonization of the bus segment, there is a need to enable low-cost financing for e-buses so that the private sector can also see an uptick in ZEV adoption. While the national subsidy schemes have spurred demand for e-buses in Telangana, the ZEV penetration in this category is still in nascent stages. One unique approach to support wider adoption of electrification could be to open high-frequency state routes for private players operating electric buses, creating a strong incentive for electrification. Measures are needed to reduce the upfront purchase cost through incentives and develop sufficient charging infrastructure to enable the transition to ZEVs in the bus category.

With this analysis of the OEM-wise vehicle sales in each vehicle category, it is clear that certain vehicle categories such as the two-wheelers and three-wheelers are better prepared for implementation of supply-side regulations while the other categories require more time. The next section provides an insight into the global examples and proposes a supply-side regulation that could be operationalized through a credit-based mechanism to accelerate ZEV adoption in Telangana.

2.4 Conceptualizing Supply-Side Policy Approach for Telangana

The global shift toward supply-side regulations has become a key strategy for accelerating the transition to ZEVs. As of 2023, 29 countries had adopted clear targets for electrification or timelines for phasing out internal combustion engine (ICE) vehicles, up from 22 countries in 2021.[19] These interventions work alongside demand-side incentives to provide long-term policy certainty, enabling nations to pursue climate and industrial objectives without depending heavily on recurring fiscal subsidies.

Robust supply-side instruments such as ZEV sales requirements, credit-based schemes, and fuel efficiency standards, not only ensure regulatory compliance but also incentivize innovation, support the adaptation of traditional automakers, and draw long-term investment into clean transport

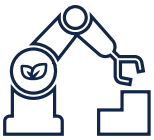
infrastructure. These tools have shown strong results in regions where regulations are paired with market-based flexibility, creating a stable and balanced environment for industry stakeholders.

Leading the ZEV transition at a sub-national level, the multi-state task force in the US, successfully brought together 16 states to collectively implement ZEV programs that resulted in achieving the combined target of 3.3 million ZEV sales by 2025.[20] Similarly in India, at a sub-national level, Telangana could take the leadership in forming a ZEV coalition to design ZEV regulation that could be piloted in the select states. The ZEV regulation could be tailored to suit the automobile industry and vehicle ownership pattern of the respective state, allowing for collaboration between states as a successive measure to implement their EV policies. This would enable the states to take critical step forward to provide strategic roadmap for decarbonization of road transport sector in their pursuit of achieving net-zero targets.

Advanced Clean Cars II (ACC II) was adopted in 2022, which required that 100% of new passenger cars and light trucks sold in California must be ZEVs by 2035.

Some of the effective national and sub-national level supply-side regulations are given below:

- **California** has led global efforts through the introduction of **Advanced Clean Cars I (ACC I)** in 2012, which integrated vehicle greenhouse gas emissions standards, ZEV requirements, and low-emission vehicle standards into a unified regulatory structure.[21] Building upon this progress, Advanced Clean Cars II (ACC II) was adopted in 2022, which required that 100% of new passenger cars and light trucks sold in California must be ZEVs by 2035.[22] Through its ambitious supply-side regulations, California has not only established a global benchmark but has also achieved measurable environmental and economic gains. In a recent setback, the U.S. federal government moved to revoke California's landmark regulation to phase out gasoline-fuelled cars and trucks by 2035.[23] Although this poses enforcement hurdles for the California administration, the journey continues to serve as a valuable guiding model for other markets looking to pursue a more pragmatic and phased strategy. California's story highlights that supply-side regulations go beyond environmental ambition and they are critical to market transformation, offering the stability required to align fiscal policy with long-term climate and economic priorities.



The production and sales of NEVs have notably increased by 34.4% & 35.5% year-on-year, and the NEV sales accounted for over 40% of new car sales in China in the year 2024.

- **China's Dual Credit Policy**, launched in 2017, compels automakers to produce and sell New-Energy Vehicles (NEVs) to meet annual credit targets. Through this policy, China aimed to reach 20% NEV sales by 2025 (already achieved) and 40% NEV sales by 2030.[24] The production and sales of NEVs have notably increased by 34.4% and 35.5% year-on-year, and the NEV sales accounted for over 40% of new car sales in China in the year 2024.[25]

- **The United Kingdom (UK)**, continues to follow Euro emission standards but has also introduced its own regulations, including the **ZEV sales requirement** which requires 80% of new cars and 70% of new vans sold to be ZEVs by 2030, with full adoption by 2035.[26]

Further to boost ZEV model availability the **European Union** has additionally introduced a credit system for zero- and low-emission vehicles (ZLEV), incentivizing manufacturers to exceed specific sales targets for electric and hydrogen-powered vehicles.[27] The EU committed to ensuring that all new cars and vans registered in Europe will be ZEVs by 2035 under the 'Fit for 55' proposal, which also includes reducing the emissions of new cars by 55% by and new vans by 50% by 2030, as compared to 1990 levels.[28] These regulations across regions have yielded tangible such as increased ZEV model availability, reduced prices, growth in ZEV sales, accelerated investment in charging infrastructure, and expanded employment opportunities in the green mobility sector. Importantly, these approaches have provided policy predictability while reducing the burden on public finances. In contrast to incentives that primarily stimulate demand, supply-side regulations provide long-term market signals and encourage sustained investment by both manufacturers and infrastructure providers. Comprehensive information on the global experience in operationalizing supply-side regulations and their impacts are captured in NRDC's report "Fueling ZEV Transition: Global Review of Supply-Side Regulations and India's Opportunity".[29]

The ZEV mandate in the US, began at a sub-national level with California as the pioneering state to implement it. Later, with the proactive approach shown by the states, the multi-state task force in the US, successfully brought together 16 states to collectively implement ZEV programs that resulted in achieving the combined target of 3.3 million ZEV sales by 2025.[30] Similarly in India, at a sub-national level, Telangana could lead the ZEV transition and collaborate with other states to form a ZEV coalition to fast track deployment of ZEVs. This would enable the states to take critical step forward to provide strategic roadmap for decarbonisation of road transport sector in their pursuit of achieving net-zero targets.

The multi-state task force in the US, successfully brought together 16 states to collectively implement ZEV programs that resulted in achieving the combined target of 3.3 million ZEV sales by 2025.

This report proposes a strategy to operationalize supply-side regulation through a ZEV sales-based credit mechanism. This supply-side intervention could be designed based on the vehicle ownership pattern and automobile manufacturing capability of Telangana. A designated nodal agency could be appointed to oversee the entire process of this credit mechanism. Each automobile manufacturer, selling the vehicles under the category eligible for credit requirement in Telangana, could be provided with an annual ZEV credit requirement that must be fulfilled for each financial year. The approach for implementing this credit mechanism for Telangana is detailed below. This tailored approach proposes a risk-reward mechanism which is contextualized for Telangana, making it more streamlined and simplified to enable ease of implementation.

1. **Lead Time for Implementation**: Providing adequate lead time is essential for the automobile industry to scale up their manufacturing capacity and equip dealerships to support increase ZEV sales. A lead time of 3 to 8 years could be considered based in vehicle segment, before enforcing the requirements on the vehicle manufacturers. Based on the maturity of ZEV technology and annual sales in a particular vehicle category, this lead time could be varied.

2. **Categorisation of Vehicle Manufacturers**: Given the wide variation in number of vehicles manufactured or imported into Telangana for sale ranging from a few hundreds to million depending on the vehicle type, it is essential to classify the manufacturers into small, medium and large manufacturers. This categorization can be determined by calculating the average number of vehicles sold by each OEM over the three consecutive fiscal years preceding the reporting period of the ZEV sales requirement.

3. **Setting Eligibility Criteria for ZEV**: The eligibility criteria for ZEVs under this credit mechanism will be based on the minimum driving range and the level of localization. To promote the sale of higher-performing ZEV models in the country, only vehicles that meet a specified minimum range will qualify under the regulation. Additionally, manufacturers must adhere to the Phased Manufacturing Plan (PMP) to support the indigenization of ZEV production. It is important to note that while the range serves as a qualifying criterion for eligibility, it is not included in calculating the ZEV requirement compliance of the manufacturer.

4. **ZEV Credit Calculation**: The ZEV regulation may initially be introduced as a pilot program for the first two years to assess performance and gather feedback from the automobile industry. The annual ZEV requirements for each manufacturer could be determined by averaging the manufacturer's sales volume over the three-consecutive financial years before the start to lead time. These annual ZEV requirements would be tailored for each relevant vehicle category taking into account the market and technology maturity of that segment.

In FY 2024-25, a total of 7,534 three-wheeler goods vehicles were sold in Telangana with the highest ZEV penetration rate of over 14% among all the vehicle segments in the state.

The formula to calculate the ZEV credit is as given below:

Annual requirement for no. of ZEVs to be sold = Annual ZEV % requirement x Sales Volume (in Number)

ZEV credits = Actual no. of ZEVs sold by the OEM - Annual Requirement for no. of ZEVs to be sold

Here, one credit = 1 ZEV sold over and above the annual requirement

For PHEVs, the value of the credit will be less than 1 and it will depend on the all-electric drive range of the PHEV.

The annual requirement for ZEVs will be defined as a percentage of the total vehicle sales by the particular OEM that must be ZEVs across Telangana. This requirement will be established annually and differentiated based on both the vehicle segment and the category of the manufacturer. The ZEV credits will be calculated as the difference between the required and the actual number of ZEVs sold by the manufacturer. In case of a surplus where actual ZEV sales exceed the requirement will earn one credit per additional ZEV sold. Conversely, a shortfall will be considered as a deficit with each ZEV below the requirement counted as one unit of non-compliance. The small and medium manufacturers may be granted certain flexibility in meeting their sales requirements as compared to the large manufacturers.

The three year average of the manufacturer's total vehicle sales in the relevant vehicle category could be used to determine the eligible manufacturer's production volume. Manufacturers may be permitted to meet some of their ZEV requirements using alternative vehicle technologies, including PHEVs or powerful hybrid vehicles, in order to facilitate a seamless ZEV transition. Furthermore, the credits' validity could be limited to three years in order to guarantee uniformity in regulatory compliance and to incentivize manufacturers to boost ZEV sales annually.

The ZEV credits will be calculated as the difference between the required and the actual number of ZEVs sold by the manufacturer. In case of a surplus where actual ZEV sales exceed the requirement will earn one credit per additional ZEV sold.

5. **Trading of ZEV Credits**: Trading and banking of ZEV credits will give manufacturers more flexibility in complying with the regulations. Manufacturers may be authorized to trade and use bank credits for up to three years following the inception year of the credit. While market forces could determine the price of the credits, the nodal agency could approve their trade. The buyer and seller could communicate their willingness to trade credits to the nodal agency. The nodal agency would then check the availability of credits with the seller, and if there are enough credits available, the intended credits would be transferred to the buyer. Eventually, a limit could be placed on the maximum percentage of annual ZEV requirements that can be met through traded credits.

6. **Mechanism to Compensate for Deficit**: In the case that a manufacturer fails to meet the ZEV requirement for a reporting period, flexibility may be granted to compensate for the deficit within a certain period of time. The nodal agency may allow the manufacturer a maximum of three years following the reporting period to compensate for ZEV deficit. The deficit could be made up in any of the following ways:

    - Carry forward valid credits from the previous reporting period
    - Purchase credits from other manufacturers
    - Earn extra ZEV credits from over compliance in the next three years

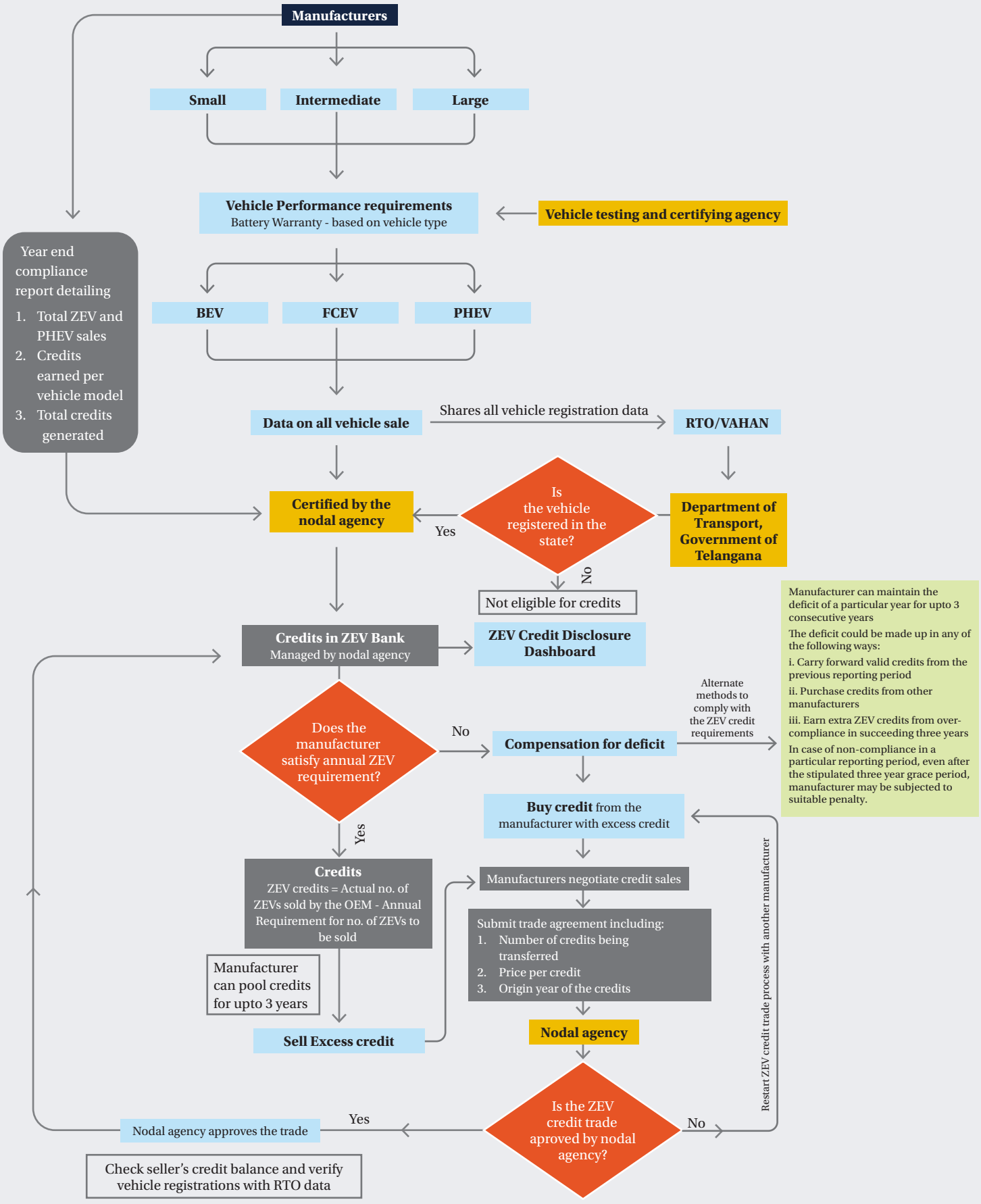
If the manufacturers fail to meet the ZEV requirements in a particular reporting period, even after the stipulated three year period, they may be subjected to suitable penalty. The penalty could be designed to exceed the cost of compliance for the manufacturers to meet the ZEV requirements.

7. **Reporting Requirements**: A twelve-month duration beginning from 1 April to 31 March of the next year may be considered as a reporting period. The eligible manufacturers are required to submit their ZEV credit calculations to the designated nodal agency. The nodal agency will maintain an individual ZEV account for each manufacturer and verify the vehicle sales data using the information compiled by the state transport department. Once approved by the nodal agency, the final compliance status for the reporting period will be communicated to the manufacturers. The annual compliance report may also be published on a dedicated public portal.

8. **Public Dashboard on ZEV Credits**: A public portal may be developed to document the ZEV credit requirement and annual performance of each manufacturer. For the Telangana specific dashboard, details such as credits earned, traded and closing balances for each manufacturer could be published at the end of every reporting period. This will help in providing transparency and ensuring accountability.

The flow chart for implementation of ZEV sales requirement in Telangana is given in the figure below.

Figure 9: Flow Chart for Implementation of ZEV Sales Requirement in Telangana



Source: NRDC Analysis

With projected energy demand expected to rise to 24,215 MW by FY30 and 31,809 MW by FY35.

2.4.1 Potential Benefits of Supply-Side Regulations

With its strong manufacturing ecosystem, the ZEV regulation in Telangana could pave the way for increased ZEV sales and manufacturing in the state. The binding sales requirement could provide policy certainty and direction for the automobile industry and complement the existing demand and supply-side incentives provided by the state.

Some of the key benefits of supply-side regulations implemented across countries are listed below.

1. **Boosting Model Availability:** In California, at the beginning of ZEV regulation in the 1990s, there were about three models of ZEVs available in the market.[31] As of 2024, California had close to 269 models of light-duty BEVs and PHEVs. States with lower levels of ZEV regulation and sales, such as Wyoming or North Dakota have less than ten models available in comparison.[32] Post the ZEV mandate, a record 132 ZEV models were introduced in the United Kingdom, 38% more than in 2023.[33]

2. **Reducing ZEV Prices:** Competitive pressures from supply-side regulations lead to cost reductions in the EV market. In the UK, manufacturers have reduced EV prices by up to 11% as of 2023 to comply with ZEV regulations, with prices dropping for nearly 7 out of 10 models. In 2024, the OEMs provided substantial discount of over 10% on recommended retail price for top ten selling EV models in UK. At the start of 2024, the price of EV was 35% higher than equivalent ICE counterpart, however by 2025, with the ZEV regulations helping to bridge the gap between ICE vehicles and ZEVs, this price gap had narrowed to 24%.[34]

3. **Driving ZEV Sales:** In US, the combined sales share of BEVs and PHEVs in the light-duty vehicle (LDV) category reached approximately 12% in ZEV-regulated states (excluding California), double the 6% observed in non-ZEV states.[35] California led the way with the highest EV market share in 2023, achieving a sales share of 26.4%.[36] In the EU, after the introduction of CO_2 regulations, the market share of EVs in Europe jumped from 3% in 2019 to 22.7% in 2023.[37] Similarly, in China, the EV market share jumped from under 6% in 2019 to 52% in 2025 as the first two phases of the New Energy Vehicle (NEV) requirements came into effect.[38]

4. **Mobilizing Investment in Charging Infrastructure:** The government schemes initially kick-started the public charging markets in the US; however, eventually with rising ZEV sales, the private sector investments have increased to approximately USD 12.7 billion by 2023.[39] In California, the state that pioneered ZEV regulation in the US, there are 48% more EV chargers as compared to gasoline nozzles, reaching 178,000 EV chargers in 2024. Furthermore, the state has approved USD 1.4 billion investment plan to build an extensive EV charging and hydrogen network.[40] Similarly, owing to the record EV sales, the UK saw a 44% increase in the number of charging stations between 2023 and 2024, with an ambitious goal of installing 300,000 charging stations nationwide by 2030.[41] Nearly GBP 6 billion (USD 7.96 billion) of private funding will be invested in the UK's charge point roll-out by 2030.[42]

5. **Increasing Employment Opportunities:** The adoption of the Advanced Clean Cars II (ACC II) rule in California and other Section 177 states is projected to generate 300,000 new jobs by 2050.[43] According to government analysis, the UK's infrastructure network alone could support 12,000 full-time equivalent jobs per year by 2030. Additionally, over 8,000 jobs are expected to be created in the manufacturing and installation of charge points.[44] In the UK, the ZEV mandate has attracted investment of nearly GBP 23 billion in ZEV and Battery Manufacturing by 2025.[45]

Implementing supply-side vehicle regulations in Telangana can yield significant benefits across economic, environmental, and energy domains. By introducing Zero Emission Vehicle (ZEV) targets alongside demand-side incentives, the state can stimulate ZEV demand while attracting manufacturers to set up local production units. Since the launch of the state's EV policy in 2020, Telangana has already secured investments worth approximately INR 8,000 crore (USD 963.86 million), with the potential to generate around 13,000 jobs, momentum that can be further amplified through regulations.[46] The supply-side regulations could drive OEMs to expand their ZEV offerings across price points and segments, ensuring access to affordable models bridging the gap in model availability and making clean mobility more inclusive in the state.

3. Conclusion

Addressing the environmental impact of the growing vehicle stock is critical to improving public health, reducing air pollution, and achieving the state's ambitious net-zero targets. Telangana stands at the forefront of India's ZEV revolution. With over 23 ZEV startups in the state and an expected investment of nearly INR 6,000 crore in the next five years, the state is well-poised to be a ZEV manufacturing powerhouse in the country.[47]

Complementing the state's existing policies with suitable supply-side regulations will further boost the ZEV manufacturing and sales. By focusing on supply-side regulations , the state can accelerate its transition to sustainable transportation, create economic opportunities, and improve public health through better air quality. With proactive measures, Telangana can set a benchmark for other states to emulate.

Image source: freepik.com

Annexure

Table 7: List of OEMs in Telangana's ZEV Sector

OEMs		Battery Manufacturers
• Mahindra & Mahindra Ltd. Pure EV • Gravton Motors • Etrio • Biliti Electric India Pvt. Ltd. • Eride E-Mobility • Olectra Greentech Ltd. • Varcas Automobiles Pvt. Ltd. • Epick Bikes • Gear Head Motors (GHM Works Pvt. Ltd.) • Deccan Auto Ltd.	• Adapt Motors Pvt. Ltd. • Persist Energy • Eunoia Innovations Pvt. Ltd. • Revelec Automotive Pvt. Ltd. • Zero 21 Renewable Energy Solutions Pvt. Ltd. • Greaves Electric Mobility (Greaves electric Mobility Pvt. Ltd. and MLR Auto Ltd.) • Keto Motors Pvt. Ltd.	• Amara Raja Energy and Mobility Ltd. • Godi India Pvt. Ltd. • Sieger Techno Private Ltd. • Cellerite Systems Pvt. Ltd. • EV RETRON Energies India Pvt. Ltd. • OptimumP Pvt. Ltd. • Altmin Pvt. Ltd. • Cygni Energy Pvt. Ltd. • Allox Advance Materials Pvt. Ltd. • Innolia Energy Pvt. Ltd.
Component Manufacturers	**Technology and R&D**	**Charger Manufacturers**
• SAMKRG Pistons and Rings • Ltd. • Medha Servo Drives Pvt. Ltd. • MG Automotives Pvt. Ltd. • MRF Ltd. • Rane Holdings Ltd. • Airgap Technology Private Ltd. • JK Fenner Ltd.	• Stellantis (FCA India • Automobiles Pvt. Ltd.) • Bosch Global Software Technogies Pvt. Ltd. • Apollo Tyres Ltd. • Ficosa India Engineering Centre Pvt. Ltd. • Hyundai Mobis (Mobis India Ltd.) • Fisker Vigyan India Pvt. Ltd.	• Axiom Energy Conversion Ltd. • Axonify Tech Systems Pvt. Ltd. • Voltino Systems LLP • Evre -Amplify Mobility Pvt. Ltd. • Nihaan Energy Pvt. Ltd.
Testing and Certification		**Smart Mobility**
• Hyundai Motor India Ltd. • Automotive Test Systems and TUV Rheinland India		• Only Electriq Solutions Pvt. Ltd. • Ohm Automotives Pvt. Ltd. • Hala Mobility Pvt. Ltd. • Race Energy (Reddy Automotive Pvt. Ltd.)

Source: ASCI-NRDC Research

Image source: freepik.com

Table 8: Key EV & ESS Policy 2020-2030 and Electronics Policy 2016 Highlights of Telangana

Incentive Category	Details / Description of Benefits
Capital Subsidies	20% Subsidy, up to INR 30 Crore for Mega Enterprises.
State Goods and Services Tax (SGST) Reimbursements	100% SGST reimbursement: 5 yrs for Micro/Small (INR 5 Cr cap), 7 yrs for Medium, Large and Mega companies for the investment made in plant and machinery
Electricity duty exemptions	• 25% tariff discount for 5 yrs (INR 5 Cr cap); • 100% duty exemption up to INR 0.5 Cr for 5 yrs for new industry units • Open access to renewable energy (up to 1/3 of total demand) allowed within state, with charges as per Telangana Electricity Regulatory Commission (TERC).
Interest Subvention	5.25% interest subsidy for 5 years capped at INR 5 Crores to reduce the effective cost of borrowing for investors
Land Allocation, Cost and Lease Rentals	• 3000 Acres of industrial land subsidized specifically for manufacturing of vehicles, components, chargers & energy storage systems. • 25% subsidy on lease rentals for 10 years. • 20% of land allotted can be used for employee dormitories.
Transportation subsidy	Up to INR 5 crore freight/fuel subsidy: 60% in year 1, reducing 10% yearly for 5 yrs
Exemption of Registration, Transfer & Stamp Duty	100% on first and 50% on second transaction, excluding govt. land.
Assistance in Patent Filing	50% cost support up to INR 2 Lakh having their company headquarters in Hyderabad.
Reimbursement of Costs for Quality Certification	50% subsidy up to INR 2 Lakh.
Research & Development	20% of project cost with a maximum amount of INR 10 Lakh
Women Entrepreneurs	• Additional 20% investment, up to INR 20 Lakh, for Micro and Small Enterprises. • INR 5 Lakh support for employing minimum 50 employees within two years of commencement of commercial operations. • 25% subsidy on lease rentals up to INR 10 Lakh per annum for three years
Other Support	Reimbursement of costs incurred for Cleaner Production, Skill Development Assistance and Training, and Exhibition

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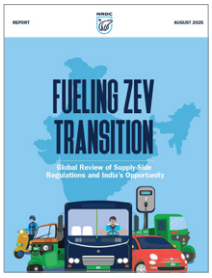

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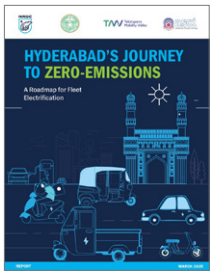

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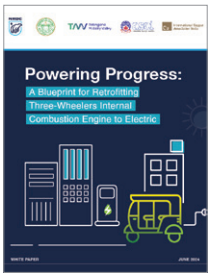

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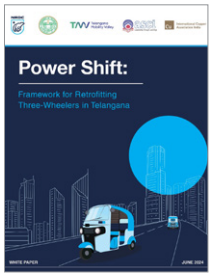

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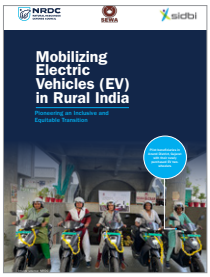

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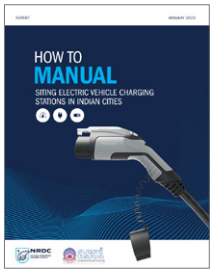

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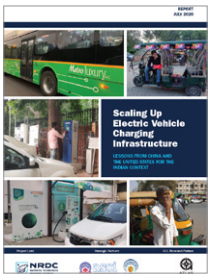

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