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Evolution of the electric vehicle industry in South India

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Contents

Foreword by Franchise India

India is focused on the transition towards green mobility, backed by government intervention and heightened investor interest, with new business models focused on creating value by aligning the industry with the latest technology.

The emergence of electric vehicles (EVs) has proved to be another path breaking technological advancement for a cleaner environment and healthy living, which have been severely impacted by the air pollution caused by billions of traditional fossil-fuel vehicles.

Most of us could not have dreamt even as recently as the last decade that electric vehicles would be replacing the traditional internal combustion engine (ICE) vehicles at such a rapid pace. However, this is now a reality, and EVs have been beneficial not only for the environment but also for several new kinds of businesses and industries. It is of utmost importance now to go green and reduce carbon emissions to zero, and electric vehicles have been helpful in accomplishing this mission.

The Indian government has set ambitious goals for the adoption of EVs as part of its overall strategy to reduce carbon emissions and combat climate change. Overall, the widespread adoption of electric vehicles in India has the potential to create significant economic, environmental and social benefits.

There have been many studies on this rapidly emerging sector, according to which India is the third-largest automobile market globally in terms of sales, ahead of sector leaders like Germany and Japan. There is now a push for manufacturers and policymakers to collaborate to shift demand towards greener options.

The automotive sector is a major contributor to India's economy, accounting for 7.1% of its gross domestic product (GDP) and providing significant employment. The Economic Survey 2023 predicts that India's domestic electric vehicle market will see a 49% compound annual growth rate (CAGR) between 2022 and 2030, with 10 million annual sales by 2030. Additionally, the electric vehicle industry is projected to create around 50 million direct and indirect jobs by 2030.

All five states within South India have well-defined EV policies, manufacturing capabilities for both electric vehicles and components, and a strong focus on research and development. This region is poised for unprecedented growth within the EV sector. This region is also likely to be a major contributor to the 2030 EV goals set out by the government, and NITI Aayog and will be key in positioning India as a global hub in the EV space.

This report is aimed at increasing the understanding of the sector itself with the intention of exploring more solutions and opportunities in the EV sector in India, which aims at building a safe and secure future of smooth mobility. In the backdrop of India assuming the G20 presidency, this is an incredible opportunity for the country to highlight its constructive climate policies and indicate its capabilities to become a global clean manufacturing hub.

Increasing efforts towards building a healthy ecosystem for electric vehicles in India are going to attract more investment from private and state-owned companies to make this project a successful one, resulting in an expected 50 million direct and indirect jobs within the automotive sector by 2030.

India is focused on the transition towards green mobility, backed by government intervention and heightened investor interest, and the new business models are focused on creating value by aligning the industry with the latest technology.

Ashita Marya
Chief Executive Officer
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Foreword by Grant Thornton Bharat

Steered by the government's focus in India, the EV market and the alternative fuel technology market, such as green hydrogen cells, clean energy and mobility solutions, are expected to attract immense investor interest.

The global automotive industry is one of the biggest industries worldwide, contributing to approximately 3% of the global GDP and accounting for over 50% of global oil consumption.

India's automotive industry, which is worth more than USD 222 billion, is a significant contributor to the country's growth, accounting for 7.1% of the total GDP and a massive 49% of the manufacturing GDP. The industry has a 40% share in global research and development and contributed a share of over 5.5% in foreign direct investment (FDI) inflow between April 2000 and June 2022.

As the Indian economy prioritises climate action and the transition towards green mobility in alignment with the 2070 net-zero targets, the EV industry will be privy to unprecedented growth and evolution in the coming years.

Steered by the government's focus in India, the EV market (projected to grow at a CAGR of 49% during 2022-30) and the alternative fuel technology market, such as green hydrogen cells, clean energy and mobility solutions, are expected to attract immense investor interest.

To be able to realise this vision pertaining to electric mobility, it is critical that the industry receives support in terms of market pull, regulatory push, as well as adequate infrastructure support, roughly translating to an investment opportunity of USD 200 billion (by 2030) in vehicle production and allied infrastructure.

The EV industry has contributed over 2.2 million units in vehicle sales since FY 2013-14, of which 72% are attributed to the previous two fiscal years. FY 2022-23 was pivotal for the EV industry, as it crossed one million units in sales, registering a robust 154% Y-o-Y growth. Additionally, the Union Budget 2023 has not only mobilised the levers to aid the automotive industry in moving towards green growth but also stirred an optimistic growth outlook.

The South Indian states continue to lead in terms of the sales of electric vehicles. With strong policy support and a clear focus on manufacturing, this region has been able to garner investments and contribute to substantial development across the EV value chain. The region has maintained a strong focus on enhancing its research and development (R&D) capabilities and has been a catalyst in creating synergies within the ecosystem by involving multiple stakeholders as the segment grows.

This report covers the broader segments within the EV industry which are likely to attract investments and how this transition is expected to be backed by government intervention, coupled with new business models focused on creating value by aligning the industry with the latest technologies. Further, it lays down the best practices followed by South India, which have acted as catalysts for enhanced growth and will continue to support the EV journey for those states.

Saket Mehra
Partner and National Sector Leader
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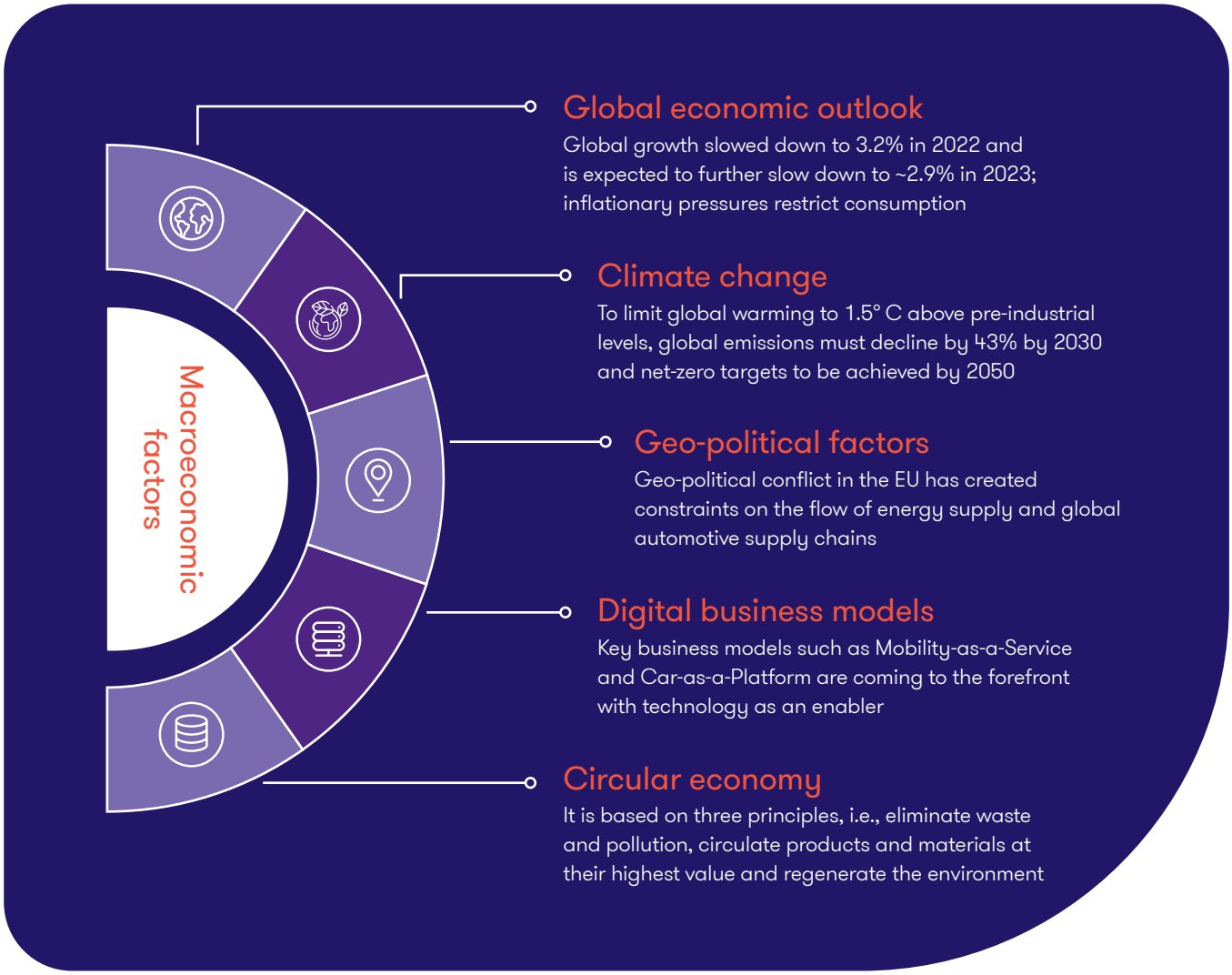
Macroeconomic overview

In the backdrop of today's volatile, uncertain, complex and ambiguous (VUCA) markets, the automotive sector is undergoing major disruptions. The pandemic certainly had an adverse impact on the sector in terms of both vehicle demand and supply. Global car sales experienced an unprecedented 16% Y-o-Y decline in 2020, which were equivalent to the 2010 sales levels.



Global automotive market

The global automotive manufacturing industry is one of the biggest industries worldwide, contributing to approximately 3% of the global gross domestic product (GDP) and accounting for over 50% of global oil consumption. It employs roughly four million people directly. The industry supports three vital pillars, i.e., mobility, industrial and infrastructure development, and people development.

The current global market for automotive manufacturing was valued at USD 2.9 trillion in 2022. Currently, the industry is working actively towards reducing fossil-fuel consumption and greenhouse gas emissions to achieve carbon neutrality. An overview of a few of the key automotive markets is covered below:

Germany

Recognised as one of the most innovative automotive industries globally, Germany is playing a pivotal role in the global transition to electric mobility solutions. The demand for full-electric cars in Germany surged in 2022 to capture almost 18% of the market share for battery electric cars. The growth of the EV industry in Germany is largely attributed to the demand for fuel-efficient, high-performance and low-emission cars, coupled with strict government laws and regulations on vehicle emissions.

United Kingdom

The automotive industry in the United Kingdom is one of the vital contributors to the country's economy. It actively contributes to the net-zero agenda, with over 0.74 million electric cars currently running in the country. Approximately 0.27 million EVs were registered in 2022, registering a 40% Y-o-Y growth. Simultaneously, the country's charging infrastructure has been able to expand to meet the needs of EV drivers. By the end of March 2023, there were around 40,000 charging points in the UK, with Greater London accounting for over 30% of the total charging points.

United States

The United States is the world's second-largest market for vehicle sales and production. Like the global automotive industry, the US automotive industry experienced a Y-o-Y decline of 8% in 2022, owing to the pandemic which amplified the chip shortage, and additional macroeconomic factors, owing to the pandemic. However, the transition to EVs has gradually resumed momentum. The EV market in the US is poised to grow from USD 28 billion in 2021 to USD 137 billion by 2028 at a CAGR of approximately 25%. With efficient batteries and faster charging, the passenger vehicle segment has been able to create a substantial share in the total EV sales within the US.

The driving factors attributable to the growth of EVs in the US include:

1. Favourable government policies and subsidies
2. Focus on research and development (R&D) to drive market growth
3. Stringent vehicle emission norms

E-mobility sector in India

The automotive industry in India is on the cusp of disruption backed by sustainability, shared mobility, autonomous and connected vehicles and seamless omnichannel consumer experience.

As the Indian economy gears to touch the USD 10 trillion mark by 2035, we expect to witness growth propelled by strong macroeconomic factors, population dividend, innovation, ideals of ***Aatmanirbhar Bharat*** and a smooth transition towards sustainable models driven by the green mandate.

The sector is a significant contributor to the country's growth, accounting for 7.1% of the total GDP and a massive 49% of the manufacturing GDP. The year 2022 has been pivotal, with the sector resurging from the pandemic amidst global macroeconomic disturbances.

The automotive sector attracted inflows of equity from FDIs of USD 32.84 billion between April 2000 and March 2022. With the announcement of directed policies and induced support, the sector is poised for growth. With an increased focus on the Production Linked Incentive (PLI) scheme, vehicle scrappage policy and EV incentives, the automotive sector is expected to create a significant impact in boosting investor confidence as well as the manufacturing sector in the country in line with the ***Aatmanirbhar Bharat*** initiative. As India expands its R&D hubs, the time is ripe to attract investment within the automotive sector, which will provide the necessary impetus to grow globally while generating significant value.

In alignment with the Long-Term Low Emission Development Strategy (LT LEDS) to UNFCCC submitted by India at COP27, prepared within the framework of India's right to an equitable and fair share of the global carbon budget leading to the country's call for 'climate justice,' it is imperative to prioritise climate action and transition towards cleaner mobility solutions. Most of the investments for the automotive sector in the medium to long term are likely to be directed towards green mobility and facilitated by the ease of doing business to ensure sustained growth.

Movement towards net-zero goals in India

India is the world's third-largest emitter of greenhouse gases. Net zero implies not adding greenhouse gases to the atmosphere. This process includes a reduction of one billion tonnes of projected carbon emissions by 2030.

The focus areas (nectar elements, or '***Panchamrit***') which encapsulate India's climate action, as presented in the 26th session of the Conference of Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC), include:

Reaching 500 GW non-fossil fuel energy capacity by 2030	50% of India's energy requirements to be renewable by 2030	Reduction of total projected carbon emissions by one billion tonnes from 2022 to 2030	Reduction of the carbon intensity of the economy by 45% by 2030 over 2005 levels	Achieving the target of net zero emissions by 2070

With India assuming the G20 presidency and the Asia-Pacific group due to host COP28, this is an incredible opportunity for the country to highlight its constructive climate policies and indicate its capabilities to become a global clean manufacturing hub.

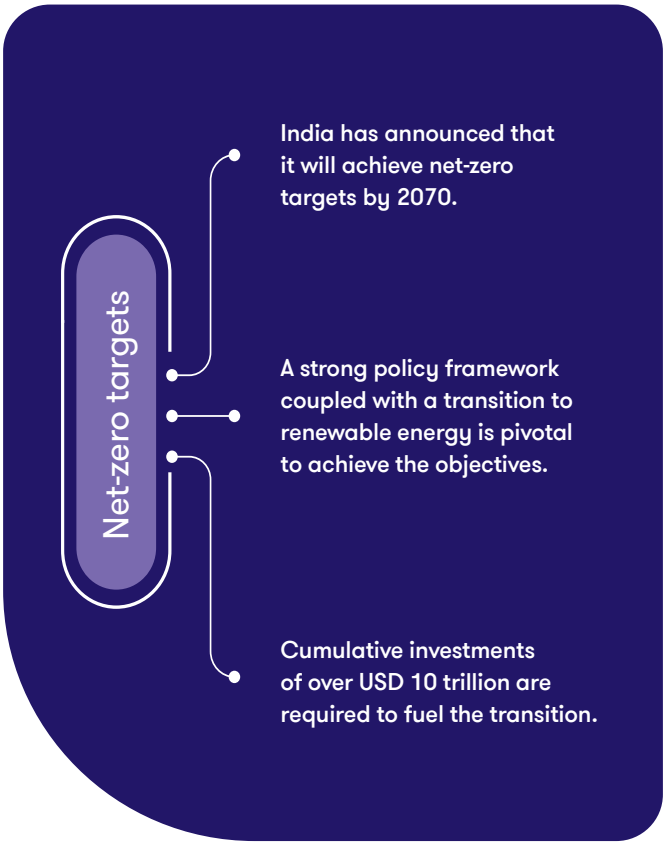
In line with the goal to achieve net-zero carbon emissions by 2070, NITI Aayog, by 2030, aims to achieve EV sales penetration of:

30%
private cars

40%
buses

80%
two- and three-wheelers

70%
commercial cars



Industry overview

The EV industry in India requires an investment of over USD 200 billion in EV original equipment manufacturers (OEMs), battery infrastructure and charging infrastructure over the next decade.

The EV ecosystem is a nexus of a multitude of stakeholders, such as fleet operators, aggregator service providers, energy operators and e-commerce. Aided by the government push (such as the Energy Conservation Bill, 2022, aimed at putting in place the provisions to make use of clean energy) and private investments, strategic alliances among these stakeholders are projected to create synergies and drive value.

The domestic EV market is expected to grow at a 49% CAGR between 2022 and 2030 and is projected to create approximately 50 million direct and indirect jobs by 2030, propelled by factors such as EVs becoming more price competitive gradually, ever-enhancing charging infrastructure within the country, investments towards research and development, along with government-backed incentives and policies, coupled with consumers' willingness to move to more sustainable mobility solutions. Additionally, EVs are bringing disruptive business models (such as Battery-as-a-Service) across the value chain to the forefront, with technology as an enabler.

The Indian EV sector attracted investments of over USD 1.6 billion in 2022, experiencing a 117% Y-o-Y growth.

The e-mobility industry attracted nearly 6% of FDI (USD 32 billion) between 2000-2022. A significant portion of these investments came in after 2015, as the industry started growing.

Industry fast facts

1.2 million
EVs sold in India during FY 2022-23

154%
Y-o-Y increase in EV sales (2021-22)

49%
CAGR expected in the EV industry by 2030

USD 200 billion
worth of investment opportunity to be attracted in the industry by 2030

Investment opportunities for the EV sector in India

In order to keep up with the projected growth of the EV sector in India, there is an investment opportunity of over USD 200 billion till 2030. This may be attributed to sectors such as OEMs and charging infrastructure and sub-sectors such as Mobility-as-a-Service (MaaS).

The high-potential investment opportunities can be attributed to the following:

Investment opportunities

Customisation

Customisation pertaining to the Indian market entails the following:

1 **The safety and reliability** of vehicles need to be ensured to withstand the extreme climate conditions in India
2 Indian EV market differs from other leading EV markets since the sales of **over 95% of EVs in India can be attributed to the two- and three-wheeler segments**. The users of this segment in India are price-sensitive and do not have easy access to finance. Solutions aimed at **reducing the total cost of ownership are vital in India.**

Indigenous production of EVs

India is heavily dependent on imports for battery material, cell and component manufacturing, thereby increasing OEMs' reliance on global manufacturers.

In order to reduce import dependence, the government is pushing for the production of batteries and advanced chemistry cells (ACCs) via PLI scheme, thus paving the way for investments within these sub-sectors as well as battery recycling.

Value chain integration

Players aiming at the integration of multiple sub-sectors within the EV ecosystem have the potential to attract investments and growth.

Companies that aim at focusing on seamless consumer e-mobility experience via vertical integration are expected to enhance profitability and reduce dependence on foreign players.

Capital demand breakup within the e-mobility sector by 2030

EV sub-sector	Investment requirement by 2030 (USD billion)
OEMs	178
Battery manufacturing (to achieve 100% indigenisation)	12.3
Charging infrastructure ecosystem	2.9

Allied investment opportunities

- Mobility-as-a-Service is expected to attract investments basis revenue from subscriptions and fleet operating models.
- As per the estimates of the Automotive Component Manufacturers Association of India (ACMA), the auto components sector will provide an EV opportunity of over USD 20 billion in the next five years, which will incentivise the opportunities within the electric auto component initiative.

Breakup of the capital demand within the OEM sub-sector

EV category	Vehicle sales (in million)	Total production costs for OEMs
Cars (private)	3.1	48
Cars (connected)	2.2	26
Buses	0.1	8
Three-wheelers	2.6	5
Two-wheelers	93.7	91

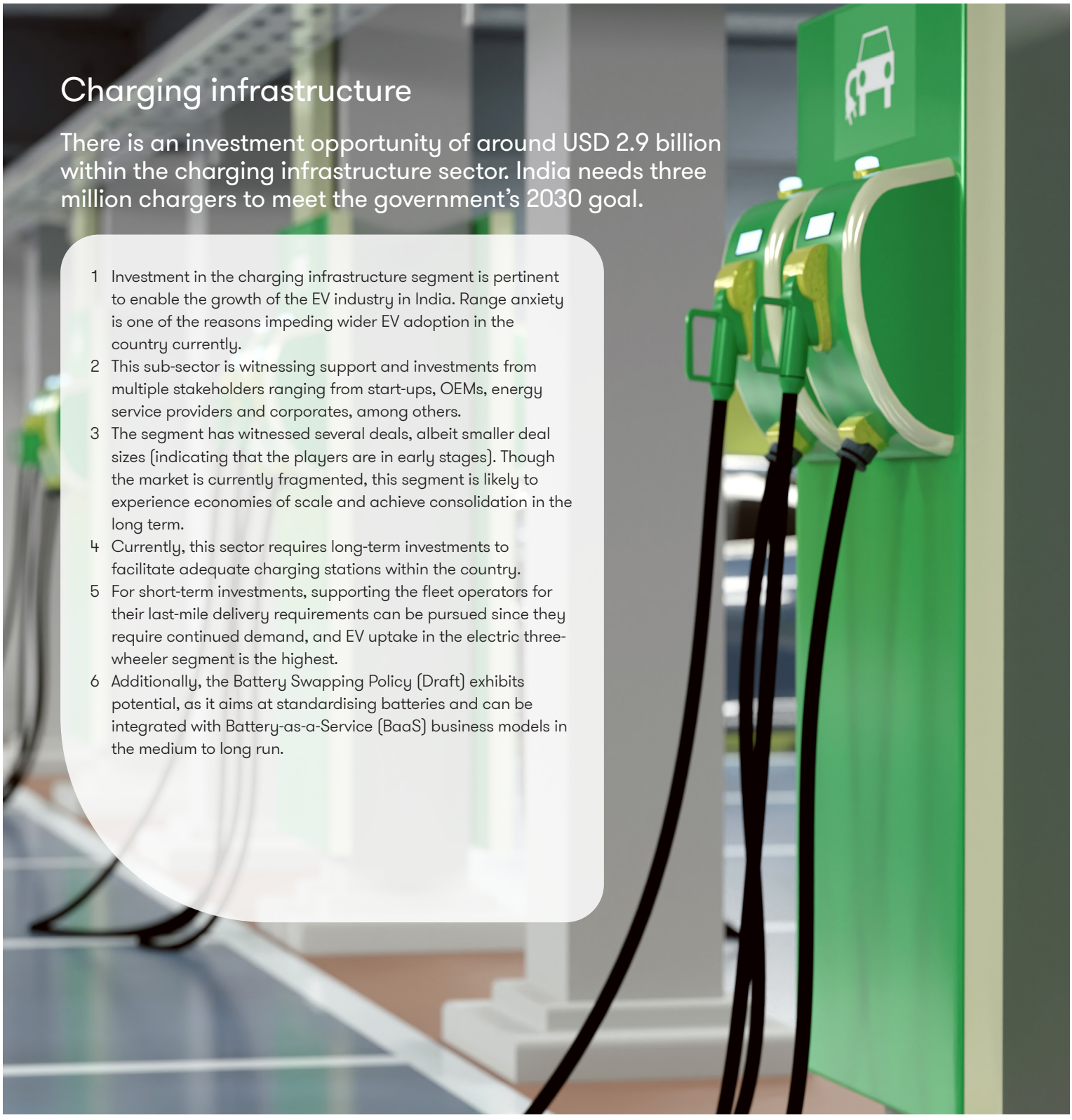
Given the demand and sales for electric two-wheelers in India, this vehicle category is poised to attract considerable investor interest.

Investment outlook - OEMs

There is around USD 178 billion worth of investment opportunity within the OEM sector.

Segment	Investment outlook
Electric two-wheeler (E2W) segment	• This segment is led by start-ups (7 out of the top 10 E2W manufacturers in 2022 were start-ups). Overall, there are over 20 OEMs in this segment, and the market is fragmented. • With lower barriers to entry in this segment, there is an extensive investment scope, given the projected volume growth. • As the EV sector consolidates, this segment is likely to witness substantial returns for investors via potential exits, both strategic and financial. • By 2030, this segment will require an investment of over USD 90 billion to be able to meet the objectives set out by NITI Aayog.
Electric three-wheeler segment	• This segment is mostly used for last-mile delivery (as the total cost of ownership is lower than internal combustion engine [ICE] vehicles) and has witnessed the greatest uptake, with electrification in this category reaching 52% in FY 2022-23. Like the electric two-wheeler segment, this segment is also fragmented and is driven by start-ups and incumbents. • However, the electric three-wheeler segment is likely to witness maturity sooner than the electric two-wheeler segment, owing to high uptake and lower market size. • Owing to the smaller market size and low production costs, this segment will require an investment of approximately USD 5 billion by 2030.
Electric four-wheeler segment	• This segment has a lower penetration rate in India (close to 0.8%), largely attributed to high upfront costs and lack of adequate charging infrastructure. Currently, the market is led by legacy players. • Though the number of vehicles required to meet the 2030 goals is substantially lower than electric two-wheelers (~5 million compared to almost 90 million E2Ws), this segment is much more capital-intensive than the electric two-wheelers segment. • OEMs are likely to drive investments within this segment and look for finance at a corporate level for their EV subsidiaries. • The segment requires approximately USD 74 billion in investments to be able to meet the government's 2030 target.
Electric buses segment	• This segment is capital-intensive and is dominated by legacy players. The demand for electric buses is largely driven by State Transmission Utilities (STUs). • Though capital intensive, this segment is quite attractive for investors, owing to lower risk, as the investments are driven by the government's demand to enhance the transportation infrastructure requirements. • As most of the e-buses operate under the Gross Cost Contract (GCC) from STUs, they become a stable source of revenue for the investors. • This segment will require an investment of over USD 8 billion by 2030.

Investment outlook



Charging infrastructure

There is an investment opportunity of around USD 2.9 billion within the charging infrastructure sector. India needs three million chargers to meet the government's 2030 goal.

1. Investment in the charging infrastructure segment is pertinent to enable the growth of the EV industry in India. Range anxiety is one of the reasons impeding wider EV adoption in the country currently.
2. This sub-sector is witnessing support and investments from multiple stakeholders ranging from start-ups, OEMs, energy service providers and corporates, among others.
3. The segment has witnessed several deals, albeit smaller deal sizes (indicating that the players are in early stages). Though the market is currently fragmented, this segment is likely to experience economies of scale and achieve consolidation in the long term.
4. Currently, this sector requires long-term investments to facilitate adequate charging stations within the country.
5. For short-term investments, supporting the fleet operators for their last-mile delivery requirements can be pursued since they require continued demand, and EV uptake in the electric three-wheeler segment is the highest.
6. Additionally, the Battery Swapping Policy (Draft) exhibits potential, as it aims at standardising batteries and can be integrated with Battery-as-a-Service (BaaS) business models in the medium to long run.

MaaS and auto components

Segment: MaaS

Investment outlook

1 This segment has piqued the interest of fleet operators and e-commerce and delivery companies (for their last-mile operations). Major delivery businesses have expressed their intention to convert their fleets to EVs.
2 MaaS for corporate employee transportation is also garnering significant attention.
3 Monthly subscriptions, GCC models and on-demand services are some of the business models in this segment. Coupled with regular cashflows, high asset utilisation is another factor which is attractive to investors.
4 The capital requirement in this segment is significant (as companies are expected to use this route to reduce their carbon footprint), and the fleet requires regular replacement due to the short battery life span of vehicles.

Segment: Auto components

Investment outlook

1 OEMs in the EV space are looking for enhanced indigenous production of auto components to enable reduced production costs of EVs.
2 There has been intensive government support to produce advanced chemical cell (ACC) batteries in the form of the PLI scheme. Additionally, as India already enjoys a competitive advantage within the auto components sector, the same can be expanded for the EV segment as well (key components include forging, castings and gearbox parts).
3 As per ACMA, the auto components sector will provide an opportunity of over USD 20 billion by 2027. With the wider adoption of EVs, a substantial portion of this opportunity can be attributed to the EV segment.

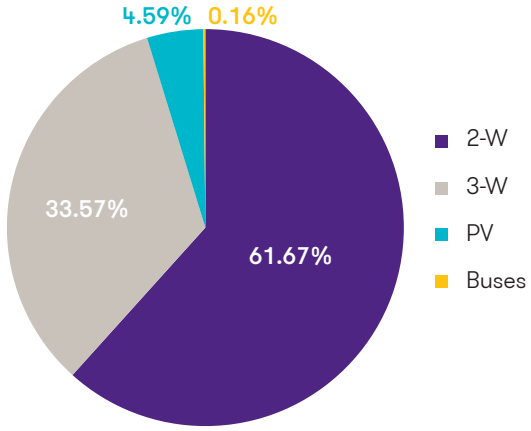
Sales analysis - India

India has witnessed cumulative EV sales of close to 2.3 million units across vehicle categories since FY 2013-14.

Sales comparison (in '000)

EV segments	2022-23	2021-22	Y-o-Y growth
2-W	779.2	279.6	179%
3-W	407.4	187.0	118%
PV	53.8	21.2	154%
Buses	1.9	1.2	62%
Others	1.0	1.3	-24%
Total	**1,243.3**	**490.2**	**154%**

Breakup of EV sales 2022-23



Over **95% of sales** are attributed to electric 2-W and 3-W.

Overall, automotive sales grew by a strong 21% in 2022-23, with 22.2 million units in sales. Out of the total sales, around 0.5% were attributed to electric vehicles.

The mix across segments has substantially changed since 2018-19, where 19% of EV registrations were two-wheelers and 79% were three-wheelers.

Segment: Two-wheelers

Sales outlook

1 This segment significantly drove EV sales in 2022-23 and accounted for over 60% of the total sales.
2 This was nearly 2.8 times the sales reported in 2021-22.

Segment: Three-wheelers

Sales outlook

1 This segment accounted for around 34% of total EV sales in 2022-23, which was 2.17 times the sales reported in 2021-22.
2 Electrification in this category reached 52%.

Segment: Passenger vehicles (PVs)

Sales outlook

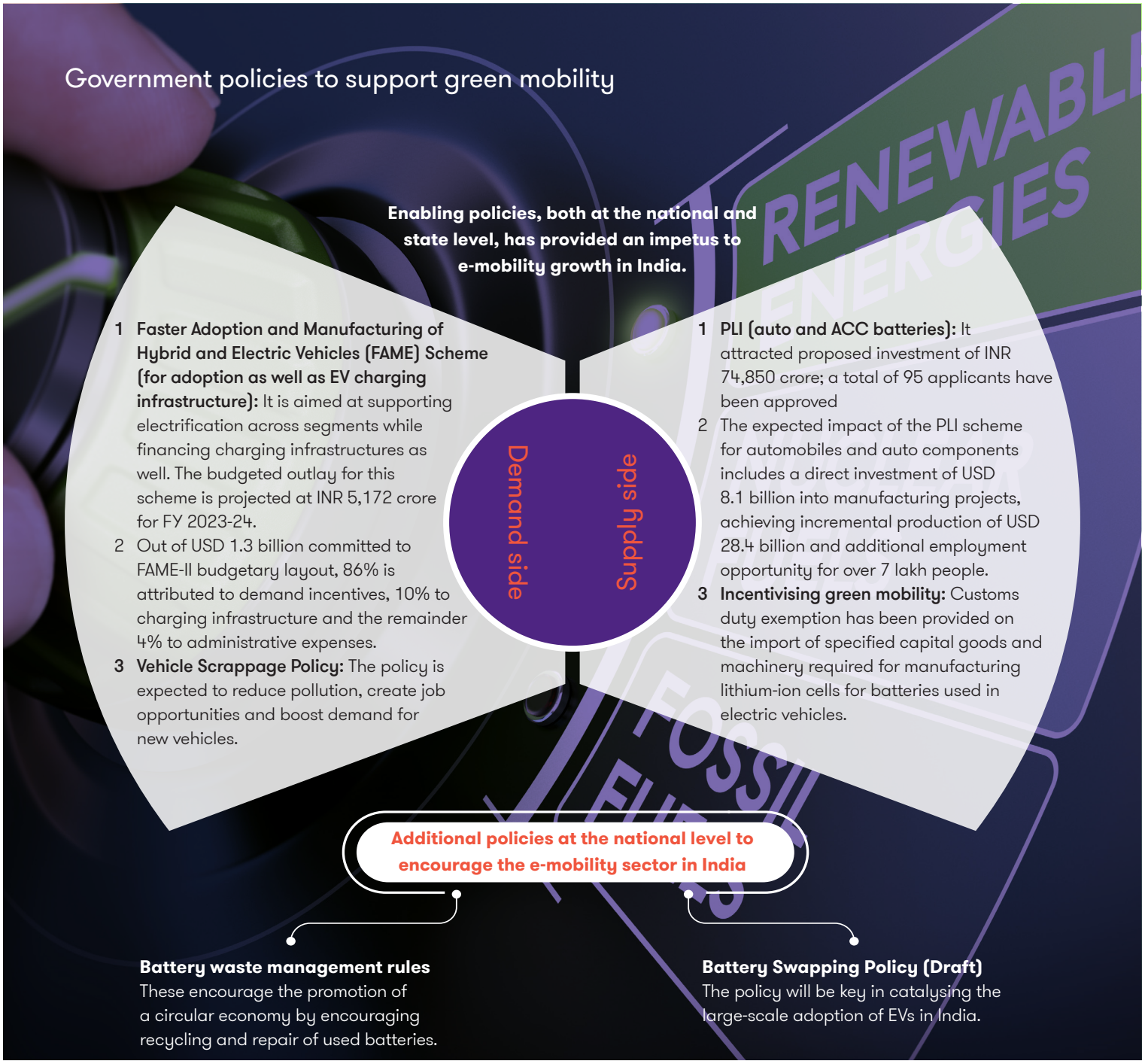
1 This segment contributed to around 4% of the total EV sales.
2 This was around 2.5 times the sales reported in 2021-22.

Segment: Buses

Sales outlook

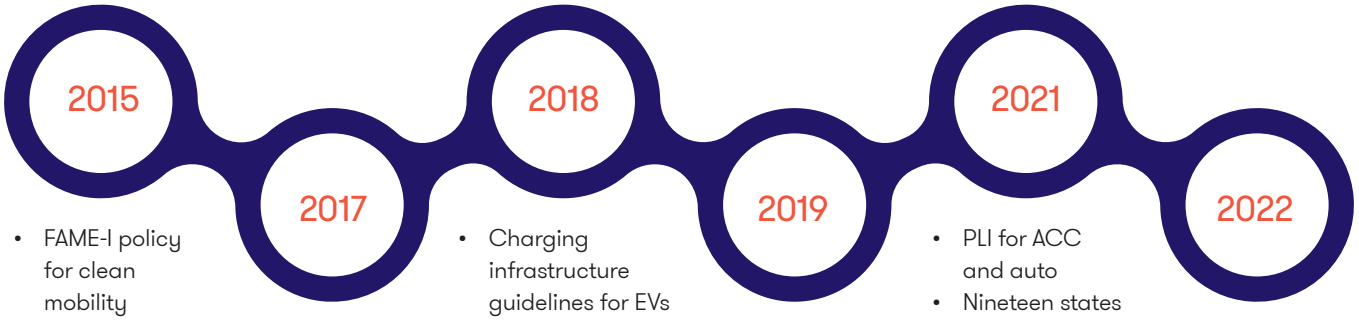
1 Contributing to less than 1% of the total EV sales in 2022-23, this segment reported an increase in sales by 1.6 times vis-à-vis 2021-22.

Government support



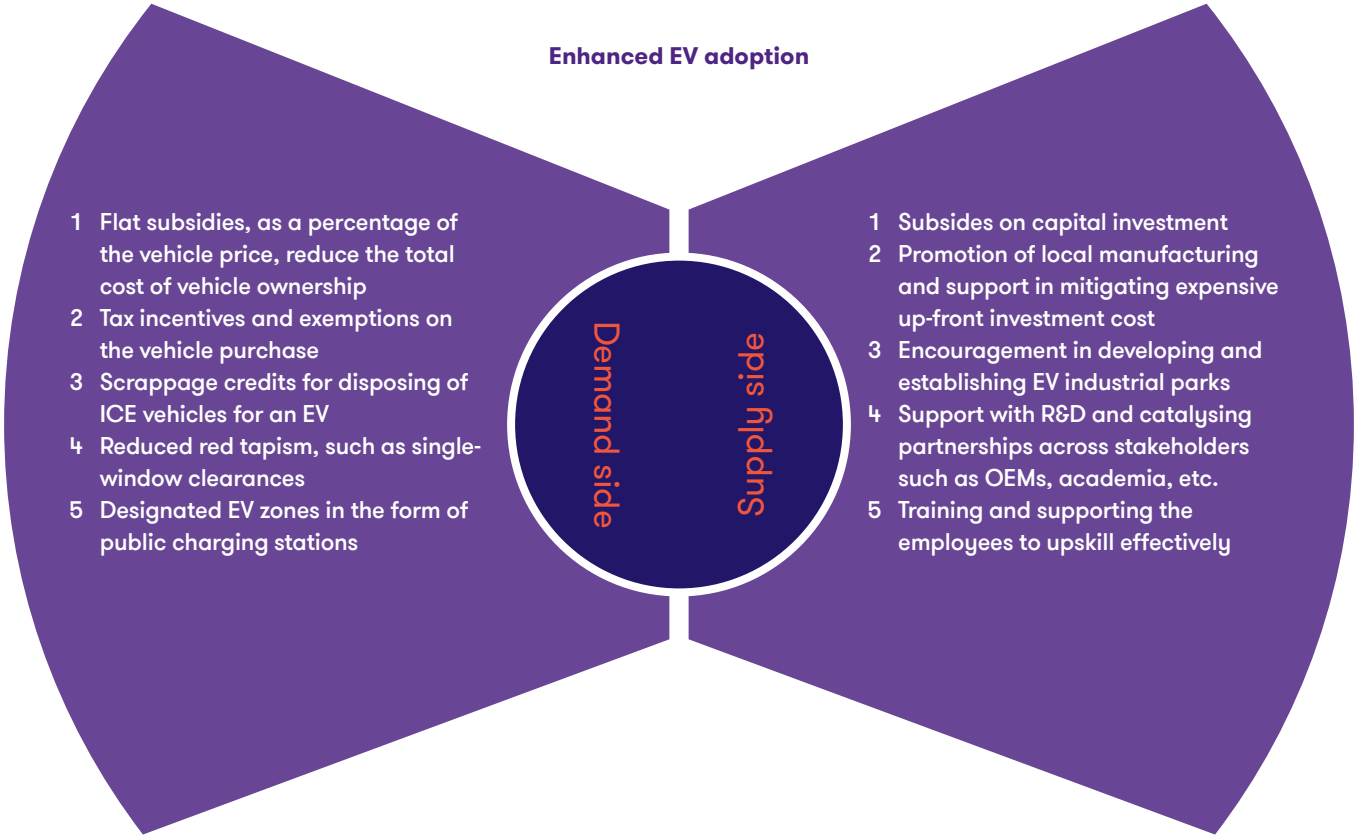
Policy support - timelines

Timeline of the government's policies to expedite EV adoption



- 2015
  - FAME-I policy for clean mobility
  - Automotive Mission Plan-II 2016-26
- 2017
  - NITI Aayog Roadmap on transformative mobility solutions for all
- 2018
  - Charging infrastructure guidelines for EVs
  - Government of India's target for 30% EV penetration by 2030
- 2019
  - FAME-II phase launched
- 2021
  - PLI for ACC and auto
  - Nineteen states with EV policies
  - FAME-II extended to FY 2023-24
- 2022
  - PLI for niche ACC
  - Battery Swapping Policy (Draft)
  - Battery Waste Management Policy

Impact of key policies



Indian EV industry: challenges

The electric vehicle industry is not immune to challenges. A few challenges that persist within the Indian EV ecosystem include:

01
- End-user financing constraints
- High insurance costs

02
- Inadequate and limited charging infrastructure and high costs of batteries

03
- Organisations must be fully equipped to deal with vehicle cybersecurity vulnerabilities, including adequate risk mitigation

Financing costs

High upfront costs of EVs necessitate the need for financing, especially for price-sensitive segments, such as E2Ws and E3Ws. However, interest rates for these customers are considerably higher, upwards of 18%, owing to:

- Technology risk
- Higher perceived risk of borrowers
- Higher insurance costs

EV infrastructure

Range anxiety is a major deterrent to the wider adoption of electric vehicles in India. The global EV/public chargers ratio is around 6-20 EVs per public charger, whereas in India, it stands at 135 currently.

Additionally, the electric power supply has to also grow in accordance with the growth in EVs to avoid voltage fluctuations and substantial power deficits.

Cybersecurity risk

With the growth in electrification and reliance on software that facilitates the smooth running of an EV, there is an increased cyber security threat faced by the ecosystem, including charging stations.

Adequate organisational and vehicle cybersecurity is pivotal to protect this segment from cyber attacks. Suitable risk mitigation processes and plans should be followed in case of a suspected threat.

South Indian EV market

The South Indian states continue to lead in sales of EVs. With a strong focus on manufacturing, this region has been able to garner investments and contribute to substantial development across the EV value chain. The region has maintained a strong focus on enhancing its R&D capabilities and has been a catalyst in creating synergies within the ecosystem by involving multiple stakeholders as the segment grows.

Kerala leads in electric PV sales with 2% penetration levels, with Karnataka (1.1%) and Tamil Nadu (1%) being the fourth and fifth largest markets, respectively. The average EV penetration rate (for PVs) in India is 0.8%.

Karnataka stands second in electric two-wheeler penetration levels in India (at 8.6%) after Delhi (at 9.6%). Kerala stands fourth at 7.3% penetration levels. The average penetration level for E2Ws in India is 4.5%.

Bangalore is gradually turning into a tech hub for green mobility solutions, offering a plethora of services such as sustainable mobility, energy infrastructure, battery management system and charging solutions, among others. These solutions propel growth in commercial use cases pertaining to fast-moving consumer goods (FMCG) and logistics sectors.

Andhra Pradesh has one of the most effective incentive schemes for charging infrastructure. Additionally, EV policies of Andhra Pradesh, Telangana, Kerala and Karnataka include concessional power tariffs for EV charging connections. Thus, the region is gradually moving towards enhanced growth within the entire EV ecosystem.

State-wise sales analysis

Andhra Pradesh

EV segments	2022-23	2021-22	Y-o-Y growth
2-W	29,004	13,428	116%
3-W	637	376	69%
PV	999	622	61%
Total	**30,640**	**14,426**	**112%**

Karnataka

EV segments	2022-23	2021-22	Y-o-Y growth
2-W	10,2912	41,290	149%
3-W	4,780	2,947	62%
PV	5,948	1,838	224%
Total	**1,13,640**	**46,075**	**147%**

Kerala

EV segments	2022-23	2021-22	Y-o-Y growth
2-W	44,399	11,404	289%
3-W	2,714	1,205	125%
PV	5,051	2,230	127%
Total	**52,164**	**14,839**	**252%**

Tamil Nadu

EV segments	2022-23	2021-22	Y-o-Y growth
2-W	65,773	35,679	84%
3-W	2,739	1,860	47%
PV	4,574	1,186	286%
Total	**73,086**	**38,725**	**89%**

These four states made up around 22% of the total EV sales in FY 2022-23, highlighting the substantial impact that South India has on the EV ecosystem in India.

Note: 1. Data for Telangana is not included in state-wise analysis.
2. Data extracted from VAHAN dashboard as on 11 May 2023
3. PVs include light motor vehicle and light passenger vehicle (as categorised in VAHAN Dashboard)

States' EV policy targets

State	EV policy targets
Andhra Pradesh	• INR 300 billion worth of investments • 60,000 new jobs • 100% public buses electrified • One million electric vehicles • 100,000 slow and fast charging stations
Karnataka	• INR 310 billion worth of investments • 55,000 new jobs • 100% road tax exemption offered for newly purchased EVs
Kerala	• One million electric vehicles by 2022 (projected in 2019) • 100% road tax exemption offered to newly purchased EVs
Tamil Nadu	• INR 500 billion worth of investments • 150,000 new jobs
Telangana	• INR 290 billion worth of investments • 120,000 new jobs • Retrofitting incentive at 15% retrofitting cost, capped at INR 15,000 per vehicle and INR 5,000 for e-autos

Key factors driving growth in South India

This section aims to highlight the focus areas for the EV sector within each region, leading to growth in investments and EV adoption in South India.

Tamil Nadu

The state, accounting for the third-largest vehicular population of India, significantly contributes to the sector.
The state has become one of the leading EV manufacturing hubs over the last five years and has signed several memoranda of understanding (MOUs) with an investment interest of around INR 24,000 crore and employment potential of 48,000 jobs. The key factors stimulating the growth of the EV sub-sector in Tamil Nadu include the presence of manufacturing giants, the availability of a skilled workforce and excellent industrial infrastructure.

The state policy aims at garnering investments amounting to INR 50,000 crore and generating 1.5 lakh jobs. The objectives of the policy include:

1 Transforming Tamil Nadu as the preferred destination for EV manufacturing in South-East Asia
2 Accelerating EV adoption by providing demand incentives and developing charging infrastructure
3 Enhancing the development of the EV ecosystem by creating a skilled workforce, promoting R&D and promoting the recycling industry by developing a circular economy
4 Developing EV cities in Tamil Nadu, such as Chennai, Coimbatore and Tiruchirappalli, among others, as pilot cities to implement e-mobility solutions and promoting electrification of commercial and public transport fleets

Kerala

The state government actively works towards aligning the development of e-mobility with the state's manufacturing ecosystem, especially for EV components. The policy aims at reducing the overall cost of EV ownership, thereby contributing to heightened EV adoption via the following strategic initiatives:

1 Addressing the viability gap by providing incentives to EV owners, such as exemption of road tax
2 Creating and developing adequate charging infrastructure
3 Promoting indigenous manufacturing
4 Enhancing awareness by organising events such as EV Expo, creation of e-mobility zones and lowering electricity tariff
5 Human capacity building and re-skilling by establishing Centres of Excellence, updating the curriculum of technical schools for EVs and autonomous vehicles (AVs), and providing skill development programs, among others

Andhra Pradesh

The state government has identified electric mobility as a robust growth driver for the coming years. The benefits approved under the state policy include:

1 Providing financial support to manufacturing firms in the forms of capital subsidy, external infrastructure subsidy, fixed power cost reimbursement (for a period of five years from the date of commencement of commercial operations), tax incentives, skill development and recycling incentives, among others
2 Charging infrastructure by providing financial incentives for private charging stations and hydrogen generation (and refuelling infrastructure)
3 Financial incentives to facilitate the purchase and expedite demand
4 Research and development grants to fund innovative solutions in the EV space

Additionally, various state government departments (such as state power distribution companies) are investing heavily to boost the charging infrastructure and are also boosting initiatives to facilitate investments from private infrastructure developers.

Telangana

With a vision to make Telangana a hub for electric vehicles and energy storage systems, the state policy primarily focuses on:

1 Making the state an attractive investment destination within the EV sector by providing support for manufacturing (including but not limited to extending tailor-made benefits to mega and strategic projects)
2 Promoting research and development by setting up EV research hubs and various Centres of Excellence for conducting market-focused research on various EV technologies
3 Ensuring faster adoption of electric vehicles by providing incentives for different vehicle categories and enhancing the availability of charging infrastructure, which also includes a battery disposal infrastructure model to facilitate deployment of used EV batteries
4 Achieving a substantial reduction in the total cost of transportation for personal and commercial purposes, which includes the support provided by the state government to facilitate aggregators involved in public transport with regulatory support to enable them to convert their fleet into EVs

Karnataka

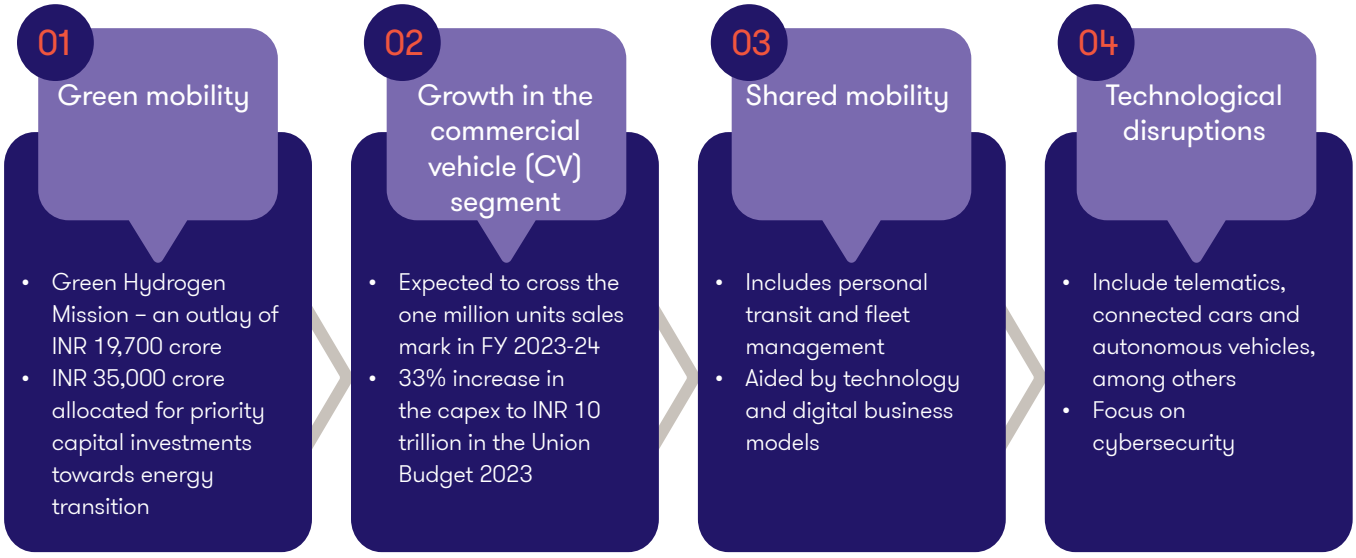
The state has the ecosystem to expedite the growth of the automotive sector in terms of manpower, robust R&D capabilities and manufacturing expertise.

The state government aims to make Karnataka a preferred destination for the development of electric mobility, provide a conducive manufacturing ecosystem and ensure skill development to keep up with the changing industry requirements. The key objectives of Karnataka EV policy include:

1 Making Karnataka a preferred destination for EV investments by providing special initiatives for EV manufacturing, providing demand-side initiatives to expedite adoption (including retrofitting) and developing charging infrastructure as a commercially viable business
2 Attracting investments of INR 31,000 crore and creating employment opportunities for 55,000 persons (both from the demand and supply side)
3 Creating a conducive environment for transferring to EVs from internal combustion engine (ICE) vehicles
4 Providing research and development opportunities by encouraging the participation of academia through setting up incubation centres, promoting research projects, supporting start-ups and setting up a venture capital fund for research in EV mobility

Opportunities and the way forward

India is focused on the transition towards green mobility, backed by government intervention, heightened investor interest and the new business models focused on creating value by aligning the industry with the latest technology. Additionally, the industry is paving the way for allied sectors such as telematics, recycling and innovative chemistry.



Transition towards green mobility, with technology as an enabler

Conclusion

At the state level, Tamil Nadu and Andhra Pradesh are two of the three states (the third being Haryana) with the strongest supply-side incentives. Additionally, these two states are also among the nine states which have mandated the creation of charging infrastructure in new residential buildings, offices, parking lots, etc.

Karnataka is one of the eight states that have specific targets for the electrification of fleets such as last-mile delivery vehicles, aggregator cabs and government vehicles.

With all five states within South India having well-defined EV policies, manufacturing capabilities for both electric vehicles and components and a strong focus on research and development, this region is poised for unprecedented growth within the EV sector.

Overall, the South Indian region has been able to provide focus to most of the stakeholders within the EV ecosystem, which is likely to expedite manufacturing and EV adoption. This region is likely to be a major contributor to the 2030 EV goals set out by the government and NITI Aayog and will be key in positioning India as a global hub in the EV space. The region continues to provide impetus to allied industries driven by the circular economy (by providing incentives for vehicle scrappage and retrofitting), thus supporting the automotive industry to reduce its overall impact on carbon emissions. Additionally, it has been an early adopter of the latest technologies, such as telematics (for fleet management) and research in autonomous and connected vehicles, which further aids electric mobility and will eventually mobilise the paradigm shift within the automotive sector in the coming years.

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Notes

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