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E-vehicle landscape in India: Policy measures in place and different vehicle models available



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_VOIS Planet portal primarily focuses on environmental sustainability covering various aspects: **Low carbon, Renewable energy usage** and **E-waste management**.

It is aimed at aggregating and helping co-create knowledge and information on environmentally responsive behaviours and concurrently pursuing result-oriented social media campaigns to encourage people and specifically the youth, to take proactive actions in promoting sustainable lifestyle and creating a positive impact on the environmental ecosystem in their surroundings

By: **_VOIS Planet**

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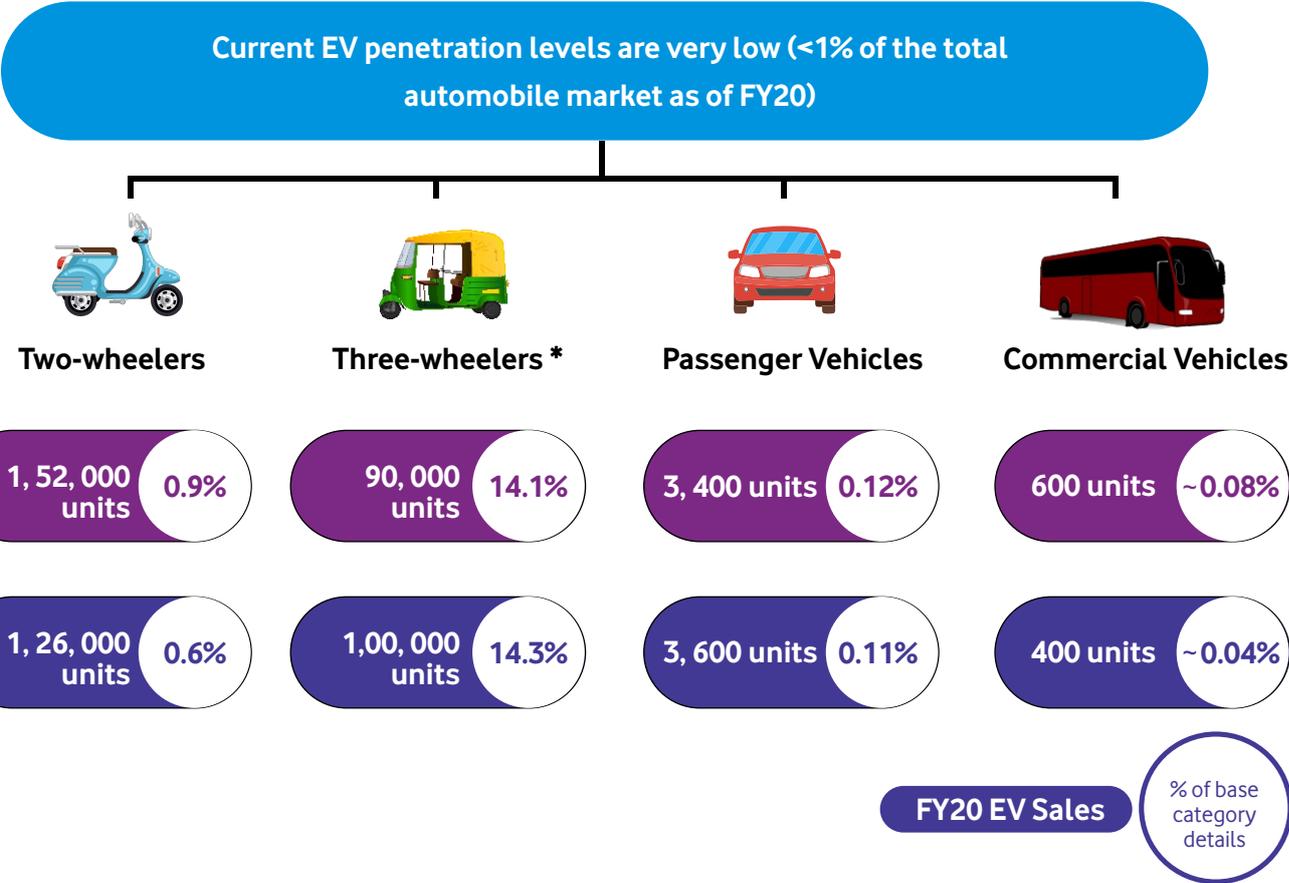
Introduction

Electric vehicles (EVs) are gaining popularity around the world as a sustainable and environment friendly alternative to traditional gasoline-powered vehicles. In India, the EV landscape is rapidly evolving, with various policies and initiatives being implemented by the government to promote the adoption of EVs.

In recent years, the Indian government has announced several initiatives and policies to encourage the use of electric vehicles, with the aim of reducing the country's dependence on fossil fuels and reducing air pollution.

One of the main drivers for the adoption of EVs in India is the government's ambitious target of achieving 30% electric mobility by 2030. To achieve this goal, the government has implemented a number of measures, including providing financial incentives for the purchase of electric vehicles, setting up charging infrastructure, and promoting the use of EVs in the public sector.

Segment wise EV sales - FY19 and FY20 and penetration as a % of ICE Sales



* In addition, the no. of e-rickshaws (i.e. inexpensive, imported kits) in India are to the tune of ~1mn units.

The number of EVs on the road have increased in the past few years. According to data from the Society of Manufacturers of Electric Vehicles (SMEV), sales of electric vehicles in India increased from 4,800 in 2015 to over 200,000 in 2020.

The market share of electric vehicles currently make up a small percentage of the total vehicle market in India, with EVs accounting for just 1% of total vehicle sales in 2020. However, this is expected to increase in the coming years, with the government's target of achieving 30% electric mobility by 2030.

In terms of electric vehicle models, two-wheelers (such as electric scooters and motorcycles) make up the majority of electric vehicles on the road in India, accounting for over 70% of total EV sales in 2020. Electric cars, on the other hand, make up a smaller percentage of total EV sales, with sales of electric cars in India accounting for just 5% of total EV sales in 2020. There are a total of 13, 92,265 EVs on Indian roads as on August 2022 . By 2030, this will likely increase by 45–50 million EVs on the road.

The growth of the electric vehicle market in India has also led to the development of a domestic EV supply chain, with several companies investing in the manufacturing of electric vehicle components such as batteries and motors. This has resulted in the creation of over 100,000 jobs in the EV sector in India.

Contributing Factors in boosting EV sector

The electric vehicle (EV) sector in India has been seeing significant growth in recent years. There are several factors that have contributed to the rising demand for EVs in India, including:

- 1. Government incentives:** The Indian government has implemented a number of policies and incentives to promote the use of EVs in the country. These include the Faster Adoption and Manufacturing of Electric and Hybrid Vehicles (FAME) India scheme, which provides financial incentives for the purchase of EVs, and the National Electric Mobility Mission Plan (NEMMP), which aims to put 5-6 million electric vehicles on Indian roads by 2020.
- 2. Increased awareness about the environmental benefits of EVs:** As awareness about the negative impact of fossil fuels on the environment has increased, more people are considering EVs as a more sustainable transportation option.
- 3. Improved technology and performance:** As the technology behind EVs has improved, they have become more practical and reliable options for everyday use. Additionally, the range of EVs has increased, making them more suitable for longer trips.

- 4. **Growing charging infrastructure:** The Indian government is also working to build a robust charging infrastructure to support the growth of the EV sector. This includes setting up charging stations in major cities and along key transportation corridors.

Overall, the rising EV sector in India is driven by a combination of government support, increased awareness about the environmental benefits of EVs, improved technology and performance, and growing charging infrastructure.

Indian government interventions & schemes

There are several policies and initiatives in place in India to promote the adoption of electric vehicles in the country. Some of the key policies and initiatives are:

Faster Adoption and Manufacturing of Electric Vehicles in India (FAME) scheme: The Indian government launched the Faster Adoption and Manufacturing of Electric Vehicles in India (FAME) scheme, which aims to accelerate the adoption of electric vehicles in the country by providing financial incentives for the purchase of EVs, setting up charging infrastructure, and promoting research and development in the EV sector. The FAME scheme has been successful in increasing the sales of electric vehicles in India, with the number of EVs on the road increasing from just a few hundred in 2015 to over 500,000 in 2020. Under the scheme of FAME-II, the demand incentive for e-2W has been increased to Rs. 15,000/kWh from Rs. 10,000/kWh with an increase in cap from 20% to almost 40% of the cost of the vehicle to increase the adoption of e-2W. Further, the phase II of FAME-India Scheme has been extended for a period of two years after 31st March 2022. This scheme was launched by the government in 2015 to accelerate the adoption of electric vehicles in India. It provides financial incentives for the purchase of electric vehicles, sets up charging infrastructure, and promotes research and development in the EV sector. (Niti Aayog, 2019)

| Total Approximate Incentives | Approximate Size of Battery |
|---|------------------------------|
| Two wheelers: Rs. 15000/- per kWh upto 40% of the cost of Vehicles | Two Wheelers: 2 kWh |
| Three wheelers: Rs. 10000/- per kWh | Three wheelers: 5 kWh |
| Four wheelers: Rs. 10000/- per kWh | Four wheelers: 15 kWh |
| E-Buses: Rs. 20000/- per kWh | E Buses: 250 kWh |
| E-Trucks: Rs. 20000/- per kWh | |

National Electric Mobility Mission Plan (NEMMP):

This plan was launched by the government in 2013 with the aim of promoting the adoption of electric vehicles in India. It aims to set up a network of charging stations across the country and provides financial incentives for the purchase of EVs.

Electric Vehicle Charging Infrastructure Policy:

This policy, launched in 2018, aims to promote the development of charging infrastructure in India by providing financial incentives for the establishment of charging stations.

Electric Vehicle Subsidy Scheme:

This scheme, launched in 2018, provides financial incentives for the purchase of electric vehicles in India.

Battery Swapping Scheme:

This scheme, launched in 2018, aims to promote the adoption of electric vehicles in India by allowing EV owners to swap their batteries at charging stations instead of recharging them.

E-Rickshaw Subsidy Scheme:

This scheme, launched in 2018, provides financial incentives for the purchase of electric rickshaws in India.

Electric Vehicle Tax Exemption:

This policy, launched in 2018, provides tax exemptions for the purchase of electric vehicles in India.

Electric Vehicle Manufacturing Scheme:

This scheme, launched in 2018, aims to promote the manufacturing of electric vehicles in India by providing financial incentives to automakers.

Types of EVs available in Indian market

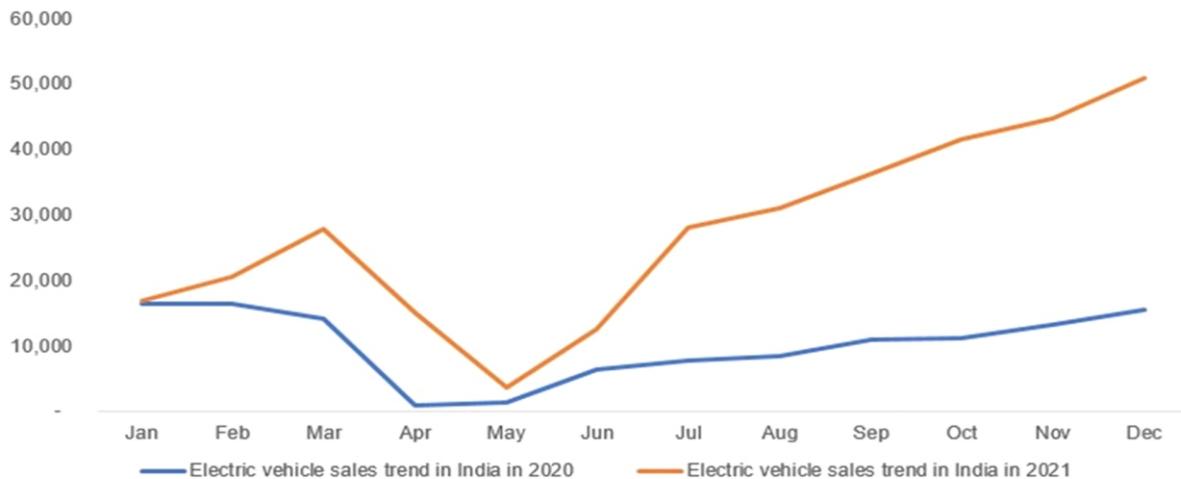
There are several types of electric vehicles (EVs) available on the market, each with its own unique characteristics and features. Here are some of the most common types of EVs:

- 1. Battery electric vehicles (BEVs):** These EVs are powered entirely by electricity, using a battery pack to store and supply power to the electric motor. BEVs do not have a gasoline engine and do not emit any tailpipe emissions. Some popular examples of BEVs available in the Indian market include the Tata Nexon EV, MG ZS EV, Hyundai Kona, etc.
- 2. Plug-in hybrid electric vehicles (PHEVs):** These EVs have both an electric motor and a gasoline engine. They can be charged by plugging them into an electric outlet, and they can also run on gasoline when the battery is depleted. PHEVs have a smaller battery pack than BEVs and can only travel a limited distance on electricity alone before the gasoline engine kicks in. Examples of PHEVs include the Toyota Prius Prime and the Ford Fusion Energy.
- 3. Hybrid electric vehicles (HEVs):** These EVs have both an electric motor and a gasoline engine, but they do not have a plug-in option. The electric motor is powered by a battery pack that is charged through regenerative braking and by the gasoline engine. HEVs cannot be plugged in to charge the battery and are not as efficient as PHEVs or BEVs in terms of their use of electricity. Examples of HEVs include the Toyota Prius and the Honda Insight.

Indian EV market share

The Indian automobile industry is the fifth largest in the world and is anticipated to become the third largest by 2030. According to the India Energy Storage Alliance (IESA), the Indian EV sector would grow at a 36% CAGR. Since population expands and demand for automobiles grow, dependency on traditional energy supplies is not a viable choice as India imports close to 80% of its crude oil requirements. By 2030, NITI Aayog hopes to reach 70% EV market penetration for all commercial vehicles, 30% for private vehicles, 40% for buses, and 80% for two and three-wheelers. This is consistent with the objective of reaching net zero carbon emissions by 2070.

Electric Vehicle Sales Trend in India (2020-21)



According to the Ministry of Heavy Industries, over the past three years, 0.52 million EVs were registered in India.

As per the figures from the EV Reporter, In Nov 2022, 76,400 high-speed e-2Ws were sold, compared to 22,474 units sold in Nov 2021. Sales of the Electric 3W Passenger Vehicle (L3+L5) reached 35,409 units, up from 16,383 over the Nov last year.

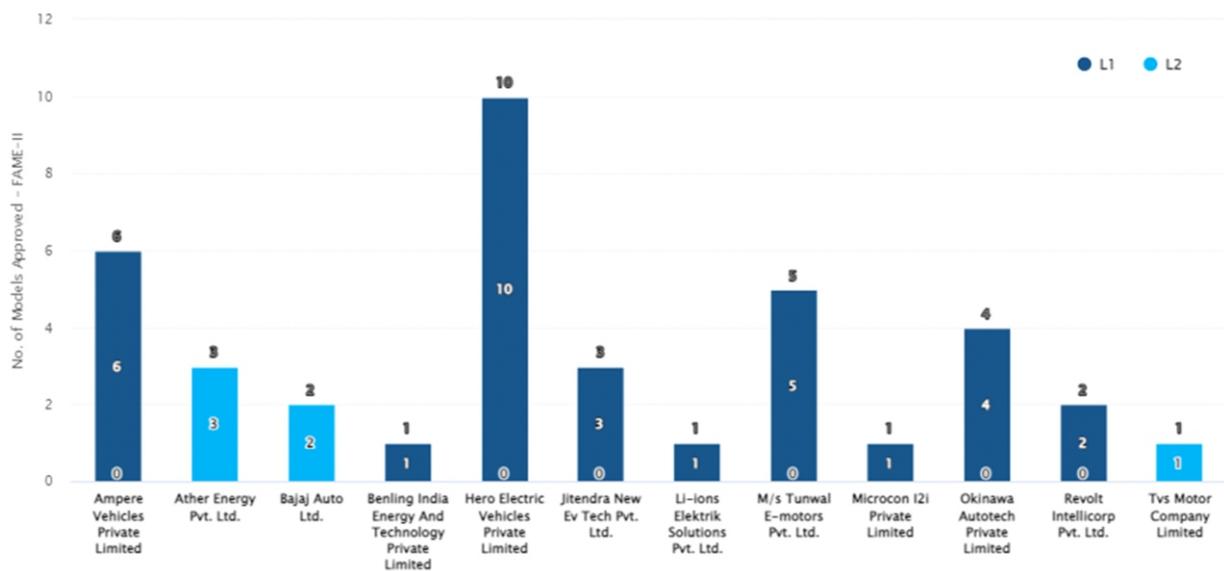
Sales of Electric 3W Cargo Vehicles increased from 1,632 units in Nov 2021 to 3,319 units in Nov 2022, while the sales of e-4W rose from 1,559 units to 5,376 units over the same period.

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In Nov 2022, 55% of the total 3W Passenger Vehicles sold were electric, up from 49% in the same month last year.

Two-wheeler EVs market-share

Hero Electric, Okinawa and Ather Energy dominates the electric two-wheeler market in India with a combined market share of 64%. Hero Electric controls 36% of the market, while Okinawa controls 21%. With an 11.1% market share, Ather Energy is gradually increasing market share as the firm expands its distribution network across India.



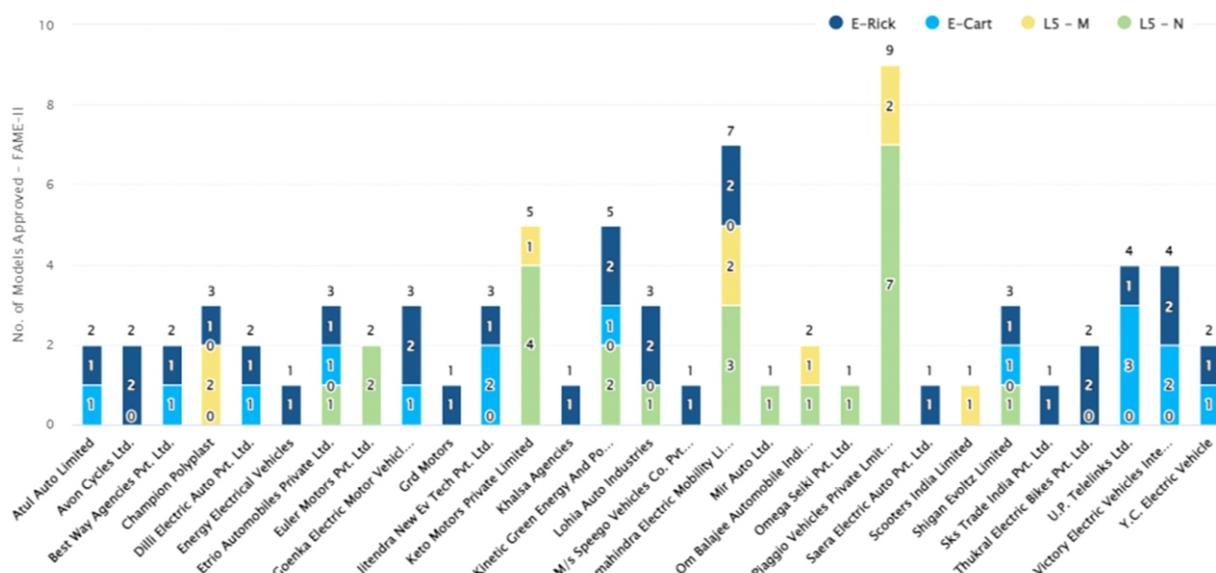
Three-wheelers EVs market share

In November 2022, in the electric-4Wheeler segment, TATA Motors remained the undisputed leader with 4,451 EV Sales and a market share of 82.8% in Nov 2022. (EVreporter, n.d.)

| S.No. | OEMs | Nov-22 | Oct-22 | Difference | % Change | NOV 2022 Market Share |
|-------|----------------|--------------|--------------|------------|----------|-----------------------|
| 1 | TATA Motors | 4451 | 4277 | 174 | 4% | 82.79% |
| 2 | MG MOTORS | 634 | 467 | 167 | 36% | 11.79% |
| 3 | KIA MOTORS | 83 | 40 | 43 | 108% | 1.54% |
| 4 | HYUNDAI MOTORS | 78 | 86 | -8 | -9% | 1.45% |
| 5 | BYD INDIA | 52 | 36 | 16 | 44% | 0.97% |
| 6 | MERCEDES-BENZ | 33 | 27 | 6 | 22% | 0.61% |
| 7 | BMW INDIA | 18 | 6 | 12 | 200% | 0.33% |
| 8 | AUDI | 9 | 3 | 6 | 200% | 0.17% |
| | Others | 18 | 28 | -10 | -36% | 0.33% |
| | TOTAL | 5,376 | 4,970 | 406 | | 100.00% |

Source: EV Reporter

The market share in the passenger car class, headed by its two core models, Nexon and Tigor EV. MG Motors India is in second place and offers the longest-range EV (MG EZS provides 439 KM range on a single charge). Other Indian manufacturers have revealed their versions, which will be released in the near future.



EV Manufacturers in Indian market

In addition to the government's efforts, there are also several private sector initiatives that are driving the growth of the electric vehicle market in India. These include the launch of several new electric vehicle models by major automakers, the establishment of charging infrastructure by private companies, and the development of battery manufacturing facilities in the country.

Four wheeler electric vehicles are gaining traction among the consumers especially in the past year. Some of the popular EV automobile manufacturers that are currently operating in India are focusing on the eco-friendly segment and have also announced their future plans to extend their portfolio to cater this particular niche of consumers.

| Company | EV related plans in India |
|---------------------|--|
| Kia | Kia plans to manufacture small SUV EVs in India for global markets in 2025. |
| Maruti Suzuki | Maruti Suzuki plans to launch its first EV model in India by 2025. |
| Tata Motors | Tata Motors bags an order worth US\$ 678 million (Rs 5,000 crore) order from the government for electric buses; it plans to launch 10 more EVs in India. |
| Hyundai | Hyundai plans to launch IONIQ 5 EV in India by the second half of 2023. |
| MG Motors | MG Motors India has partnered with Bharat petroleum for expanding the EV charging infrastructure. |
| Mahindra & Mahindra | Mahindra and Mahindra targets to launch 16 EV models across its SUV and LCV categories by 2027. |



Indian E-Two-wheeler market to hit 5mn by 2025 that accounts for 25-30 percent of total market.



Indian E-three-wheeler to account for 30 percent of sales by 2025.



India's passenger vehicle industry is expected to show a growth of 16 percent in FY 2023.

Source: KPMG

Electric two-wheelers have seen significant growth in sales in India in recent years. The Indian government has been promoting the adoption of electric vehicles as part of its efforts to reduce air pollution and reduce dependence on fossil fuels. Incentives such as subsidies and tax breaks have helped increase the affordability of electric two-wheelers and make them more attractive to consumers.

| Model | September 2022 | September 2021 | YoY Gain |
|--------------------|----------------|----------------|----------|
| Ather 450X | 8862 | 2523 | 251% |
| Dkinawa Praise Pro | 8456 | 3890 | 117% |
| TVS iQube | 4923 | 766 | 543% |
| Bajaj Chetak | 4035 | 642 | 529% |
| Okinawa iPraise | 2397 | 545 | 340% |

How EV adoption can help in achieving net-zero target?

As per the World Bank's report, India's 1.4 billion people are exposed to unhealthy levels of ambient PM 2.5 – the most harmful pollutant - emanating from multiple sources. These small particulates with a diameter of less than 2.5 microns, is about one-thirtieth the width of a human hair. Exposure to PM 2.5 can cause deadly illnesses such as lung cancer, stroke, and heart disease (WHO). (World Bank, n.d.)

Transportation sector is one of the major contributors to the total pollution generation in India. Driving an electric vehicle can help to reduce carbon footprint because there will be zero tailpipe emissions. It can reduce the environmental impact of charging vehicles further by choosing renewable energy options for household/domestic electricity.

As per the World Health Organisation (WHO), India has the world's worst air quality in 2020. The major contributor to this is the vehicular pollution emitted from the increasing number of private owned Internal combustion engine vehicles (diesel & petrol vehicles). Toxic emissions from petrol and diesel vehicles lead to long-term, adverse effects on public health. The emissions impact of electric vehicles is much lower than petrol or diesel vehicles. From an efficiency perspective, electric vehicles can convert around 60% of the electrical energy from the grid to power the wheels, but petrol or diesel cars can only convert 17%-21% of the energy stored in the fuel to the wheels (eAmrit, Niti Aayog).

Fully electric vehicles have zero tailpipe emissions, but even when electricity production is taken into account, petrol or diesel vehicles emit almost 3 times more carbon dioxide than the average EV.

Challenges for EV market

Despite these above-mentioned efforts from government and private stakeholders, the adoption of EVs in India has been slow, and there are several challenges that need to be addressed in order to accelerate their adoption

Lack of Charging Infrastructure:

One of the key challenges facing the adoption of electric vehicles in India is the lack of charging infrastructure. Despite the government's efforts to set up charging stations, the country still lacks a comprehensive charging network, with many EV owners relying on charging at home or at work. However, this is gradually changing, with private companies and startups investing in the development of charging infrastructure, and the government launching the National Electric Mobility Mission Plan (NEMMP), which aims to set up a network of charging stations across the country.

High Upfront Cost:

Another challenge facing the adoption of electric vehicles in India is the high cost of EVs compared to traditional fuel-powered vehicles. While the government's financial incentives have helped to reduce the upfront cost of EVs, they are still significantly more expensive than traditional vehicles, which has deterred many potential buyers. However, the cost of EVs is expected to decrease in the coming years, as the technology improves and manufacturing costs decline.

Limited Model availability:

Limited model availability is one of the challenges for the electric vehicle (EV) market in India. Currently, there are only a few models of EVs available in India, which may not meet the needs of all consumers. This can be a barrier for widespread adoption of EVs, as consumers may not find a vehicle that meets their needs or preferences.

There are several factors that contribute to limited model availability in the EV market in India. One is the lack of investment in research and development (R&D) by automakers. Many automakers have not invested significantly in developing EVs for the Indian market, which has limited the number of available models.

Another factor is the high cost of producing EVs. The high upfront costs of producing EVs can make it difficult for automakers to offer a wide range of models, as they may not be able to recover the costs through sales.

Finally, limited model availability may also be due to the limited demand for EVs in India. As the market for EVs is still relatively small, automakers may not see a large enough demand to justify the development and production of a wide range of models.

Overall, increasing model availability in the EV market in India will require a combination of increased investment in R&D by automakers, reduced production costs, and increased demand for EVs.

Range Anxiety:

Range anxiety is a common concern among consumers considering the adoption of electric vehicles (EVs). It refers to the fear that an EV will not have enough range to reach a destination, or to complete a long trip, and that the driver will be stranded without a means of recharging the vehicle.

Range anxiety can be a significant barrier to the adoption of EVs, as it can discourage consumers from switching from traditional gasoline-powered vehicles. To address this challenge, it is important for automakers and governments to work to improve the range of EVs, and to expand charging infrastructure.

Limited awareness:

Limited awareness can be a challenge for the adoption of electric vehicles (EVs) in India. Many consumers may not be aware of the benefits of EVs, such as reduced emissions and lower operating costs, or may not understand how EVs work and how to charge them.

Conclusion

The electric vehicle (EV) market in India is facing several challenges, including limited infrastructure, high upfront costs, range anxiety, dependence on imports, limited model availability, lack of incentives, and limited awareness.

To overcome these challenges and promote the widespread adoption of EVs in India, it will be necessary to address these issues through a combination of measures. This may include increasing investment in research and development (R&D) and reducing production costs to increase the availability of EV models, expanding charging infrastructure to address range anxiety, and offering incentives and subsidies to encourage adoption.

Additionally, increasing education and outreach efforts can help to increase awareness and understanding of EVs among consumers, and promoting the availability and convenience of charging infrastructure can help to alleviate concerns about range anxiety.

Overall, addressing these challenges will be critical for the success of the EV market in India and for the country's efforts to reduce its reliance on fossil fuels and reduce greenhouse gas emissions.

The electric vehicle (EV) market in India has significant potential for growth, considering the current scenario. There are several factors that are expected to drive the growth of the EV market in India in the coming years:

- 1.** Government support: The Indian government has announced ambitious goals for the adoption of EVs in the country and has implemented a number of policies and initiatives to encourage the adoption of EVs. These include incentives and subsidies for consumers, tax breaks for automakers, and funding for charging infrastructure.
- 2.** Falling costs: As production scales up and technology improves, the costs of EVs are expected to continue to decline, making them more accessible to consumers.
- 3.** Increasing demand: As awareness and understanding of EVs increases, and as the costs of EVs continue to fall, it is expected that demand for EVs will increase in India.

4. Improved charging infrastructure: As the number of EVs on the road increases, it will be necessary to expand charging infrastructure to support them. This will be critical for addressing range anxiety and making EVs a viable option for long trips.

Overall, the future scope of the EV market in India looks promising, as the government and industry are working to overcome the challenges facing the market and drive the adoption of EVs in the country.

References

1. EVreporter. (n.d.). Retrieved from <https://evreporter.com/indias-electric-vehicle-sales-trend-november-2022/>
2. IBEF. (n.d.). ELECTRIC VEHICLES MARKET IN INDIA. Retrieved from <https://www.ibef.org/blogs/electric-vehicles-market-in-india>
3. Ministry Of Road Transport and Highways. (n.d.). Retrieved from https://morth.nic.in/sites/default/files/Annual%20Report_21-22-1.pdf
4. Niti Aayog. (2019). ZERO EMISSION VEHICLES (ZEVs): Towards A Policy Framework. Retrieved from https://e-amrit.niti.gov.in/assets/admin/dist/img/new-fronend-img/report-pdf/EV_report.pdf
5. Niti Aayog. (n.d.). Types Of Electric Vehicles. Retrieved from <https://e-amrit.niti.gov.in/types-of-electric-vehicles>
6. World Bank. (n.d.). Retrieved from Catalyzing Clean Air In India: <https://www.worldbank.org/en/country/india/publication/catalyzing-clean-air-in-india>



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