# ELECTRIC VEHICLE: A PARADIGM SHIFT TO SUSTAINABLE MOBILITY

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## ABSTRACT

Sustainable development is about meeting the needs of the present without jeopardizing the ability of future generations to meet their own needs. The concept of sustainability involves creating goods, services, and products that fulfill our current requirements while safeguarding the potential for future generations. This idea of sustainability extends beyond short-term financial gains and emphasizes the long-term social and environmental sustainability of our actions. In India, companies and start-ups are combining resources to protect the environment and combat climate change by adopting sustainable practices. They are utilizing recycled or renewable resources to minimize energy use and waste, demonstrating their commitment to sustainable development. The paradigm of sustainable marketing focuses on promoting long-term social and environmental sustainability. In the industrial sector, upgrading infrastructure and adopting clean and environmentally friendly technologies can be encouraged. This includes electrifying freight transport and embracing electric vehicles (EVs) for delivery and ride-sharing. By enhancing scientific research and upgrading technological capabilities, existing value chains can be disrupted, and India can become a hub for EV manufacturing and related exports. As experts and decision-makers from around the world convene for the Transport and Climate Change Week in Berlin, it is essential for India to re-affirm its commitment to a sustainable mobility future that is aligned with global efforts towards trust-building and consensus. It is crucial to recognize that electric mobility must be a cornerstone of India's sustainable development agenda. This paper presents a comprehensive study that explores the potential impact of mass EV adoption in a short time span, highlighting the need for sustainable energy practices. Through a review of secondary sources, the paper examines how EVs can contribute to achieving sustainable energy goals while ensuring environmental sustainability. By embracing electric mobility and renewable energy, India can create a greener and more sustainable future while achieving its SDGs. It is time for India to demonstrate its leadership in sustainable development and work towards a cleaner, healthier, and more equitable society.

**Keywords: Sustainable Development, Electrical Vehicle, Challenges, Opportunities.**

## INTRODUCTION

India is advancing steadily towards achieving a sustainable and inclusive development agenda, while also taking into account the urgent need to meet the socio-economic aspirations of its billion-strong population. This aligns with the country's strong commitment to attaining the Sustainable Development Goals (SDGs) agreed upon globally. Notably, India has achieved significant success in reducing greenhouse gas (GHG) emissions while sustaining economic growth, having reduced the emissions intensity of its GDP by 24% between 2005 and 2016.The Sustainable Development Goals (SDGs) are not merely principles to adhere to; they are promises to future generations for a secure and safe future. By following sustainable practices, we can ensure that we leave behind a better world for future generations to inherit. Electric vehicles (EVs) powered by renewable sources have the potential to address a wide range of Sustainable Development Goals (SDGs) and contribute to the clean economic revival of the country. India has already taken significant steps to prioritize this sector and has the necessary policy support from the government. Although the emissions intensity of GDP has decreased, the absolute emissions have not, resulting in pervasive warming and a range of harmful social and ecological consequences. The IPCC has warned that a rise of 1.5°C in global temperatures from pre-industrial levels could result in a perilous increase in sea levels, causing adverse health effects, loss of livelihoods, and economic insecurity, disproportionately affecting vulnerable populations. India, with its extensive coastline, substantial population, and high levels of inequality and poverty, is likely to be one of the countries most impacted by these changes. To address climate change and its many hazards, there is an urgent need for sustainable development that is community-focused.

## STATEMENT OF THE PROBLEM

In the present predicament, India's concern over air pollution has risen exponentially. Many Indian cities are being ranked among the most polluted in a recent worldwide assessment. Main industries contributing to the air pollution are industrial sector and transport sector. The industrial sector is responsible for 51% of this air pollution, and the transportation sector is responsible for 27% of it. Two million Indians die prematurely each year as a result of air pollution. As one of the largest producers of $CO_2$ emissions, the transportation industry must be transformed into a green one. Electric Vehicles (EV) can be a gift in reducing GHG emissions in order to reduce air pollution. Electric vehicles provide a number of benefits, including less pollution and lower costs for purchasing fuel. Furthermore, there are many risks involved with introducing electric vehicles in India. In order to stay up with the worldwide development of EVs, the Indian government has developed extensive strategies for bringing EVs to the Indian market. This research provides an overview on electric vehicles and examines the positive and negative aspects of promoting EVs in India.

## OBJECTIVES OF THE STUDY

The specific objectives of the study are:

- To acquire knowledge about the increasing prevalence of electric vehicles
- To possess a fundamental awareness of the ecological effects of electric vehicles.
- To investigate the rationale for promoting electric vehicles.
- To learn about the policies and incentives the government has implemented to promote electric vehicles.
- To research the prospects and constraints the industry for electric vehicles has faced.

## RESEARCH METHODOLOGY

The research is being done to provide an insight on the Indian Electric vehicle Market as well as the prospects and challenges faced by the EV sector. For the study, secondary data were employed. Using sources, such as online journals, papers, and websites, secondary data was gathered.

## REVIEW OF LITERATURE

**Schulz (2022)** explains that as of right now the driving range of a fully recharged EV is lower than a fully fuelled ICEV and takes longer time to charge. Though there is an argument that the battery industry is still improving with bigger and better batteries being developed. He further explains that even though the EVs are not able to drive as far as traditional cars, consumers and potential adopters might look past it if the charging infrastructure improves. **Aftonbladet,(2022)** in his article announced that there is a lack of charging stations in Swedish parking lots; less than one percent of 650 000 parking spots offer charging**. MenonjyotiKalita, Golam Imran (2021),** in their research stated that the consumers have to be made aware regarding the use of EV. The social factors besides the government are also taking many policies to adopt the EV. The charging infrastructure is one of the main concerns of the EV market expansion. More and more public and private sector has to come up to set up the charging infrastructure. There are many challenges that are being faced in the initial investment and adoption of market, but due to the opportunities the EV market will expand.**M Sverige (2021)** also presented similar results, only seven of the Swedish counties passed in the amount of charging stations required, the rest of the counties have far too few charging stations according to recommendations from the EU. According to the statistics presented by an interest organization in the Swedish electric power industry, PowerCirle, there is a clear yearly increase in charging stations. At the end of 2021, there are reportedly 13.362 charging stations in Sweden **.** A more detailed chart of the number of charging stations in each county in Sweden is presented by M Sverige, which among other things shows that the charging infrastructure must develop to be able to keep up with the increasing number of cars that need to be charged . Thisbecomes a problem since the charging time is much longer than fuelling a car, the average time Norwegian people spent their time in charging stations was 21.9 minutes**. Sonali Goel [a], Renu Sharma [a], Akshay Kumar Rathore (2021),** this paper provides a detailed overview of the literature, overview, and guidelines for HEV, PHEV and BEV penetration rate studies into the Indian Market.

The recent initiatives and various subsidies by the Indian Government will help push the e-mobility drive in India. The development of a new concept of Vehicle-to-Grid can either deliver power to the grid or can be used to charge the battery when non-conventional energy sources are not available. This technology is an important aspect of energy security, renewable energy, and giving a great scope to deal with global warming issues. This paper provides a summary of an electric vehicle's barriers and problems in the Indian context and is the main novelty of the paper. **Mohamed M, G Tamil Arasan1 and G Sivakumar (2020)**, in their study stated that the implementation of EVs in India aims primarily to reduce greenhouse gas emissions and cut oil expenses. The vision obligation towards many environment friendly agreements has given it a situation where it is prompted to implement vision 2030.

## TRANSPORT SECTOR

The transport sector is a major contributor to the rise in emissions, accounting for 13.5 percent of India's energy-related $CO_2$ emissions. Within this sector, road transport is responsible for a staggering 90 percent of final energy consumption. The use of internal combustion engine (ICE) vehicles, which make up the majority of the country's motor fleet, is rightly criticized for exacerbating air pollution, endangering public health, and perpetuating the use of fossil fuels. These factors pose significant challenges to India's sustainable development goals (SDGs). Therefore, reducing emissions from the transport sector by transitioning to clean mobility solutions must be a crucial element of any comprehensive strategy to address climate change and its consequences.

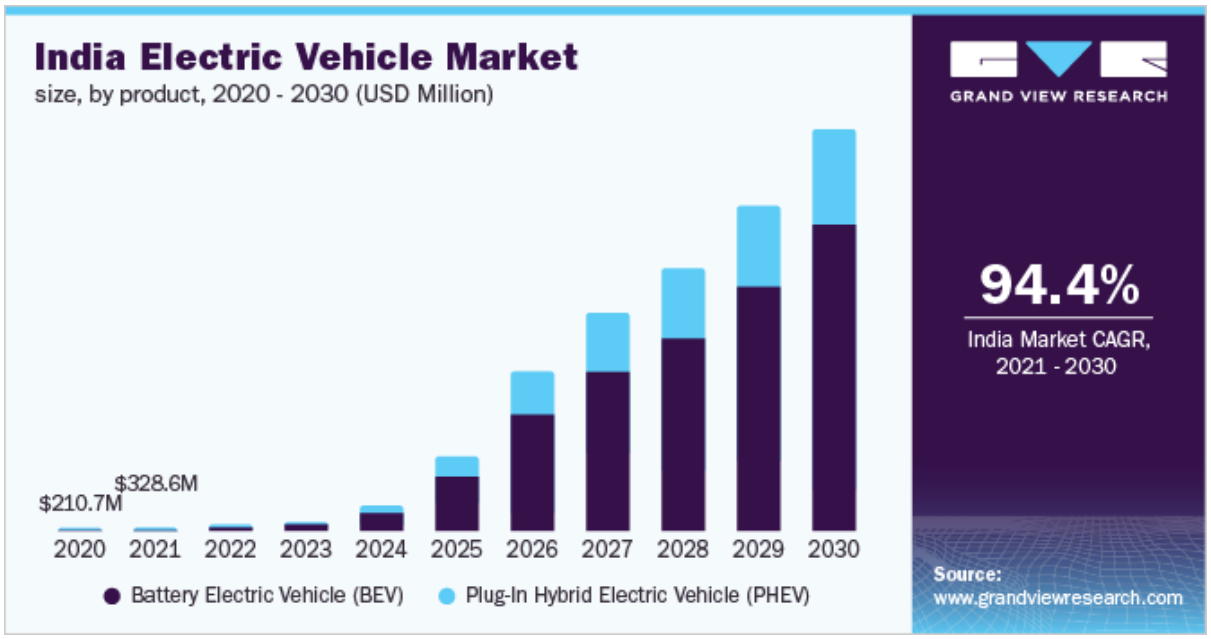
## ELECTRIC VEHICLES - A RAY OF HOPE

The transport sector is a significant contributor to the increasing levels of emissions in India, accounting for 13.5 percent of the country's $CO_2$ emissions related to energy. Road transport alone accounts for a staggering 90 percent of the sector's final energy consumption. The extensive use of internal combustion engine (ICE) vehicles, which constitute the majority of the nation's motor fleet, has rightly drawn criticism for worsening air pollution, endangering public health, and perpetuating the reliance on fossil fuels. These issues pose significant challenges to India's sustainable development goals (SDGs). Therefore, any comprehensive strategy to address climate change and its consequences must include a crucial element of transitioning to clean mobility solutions to reduce emissions from the transport sector.

One of the benefits of battery technology is its potential to foster sustainable and inclusive industrialization by facilitating the integration of small-scale industrial enterprises into value chains and markets. Furthermore, batteries can be mined for precious metals at the end of their life cycles, promoting sustainable resource management and efficient use of natural resources. Recycling and proper end-of-life management of used batteries can also lead to a significant reduction in waste generation.

India has introduced several initiatives to encourage the adoption and production of electric vehicles (EVs). However, despite these efforts, there remains room for further action on this front. To guide policy, the Sustainable Development Goals (SDGs) can offer principles that are essential. The normative foundation for all EV-related decision-making should be universal access to affordable, reliable, and modern energy services. India must also pledge to provide access to safe, affordable, accessible, and sustainable transportation systems by integrating EVs into all vehicle segments, including buses for emission-free public transportation.

The India electric vehicle market size was valued at USD 220.1 million in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 94.4% from 2021 to 2030. The attractive incentives being offered by the Indian government on the production and purchase of electricvehicles to encourage the adoption of electric vehicles are anticipated to drive the growth of the market over the forecast period.




The stringent Green House gas (GHG) emission norms drafted by the government, such as the Bharat Stage (BS) VI emission standards introduced by India's Ministry of Road Transport and Highways (MoRTH), are also expected to play a decisive role in driving the growth of the market.

## REASON FOR PROMOTING ELECTRIC VEHICLES BY THE INDIAN GOVERNMENT

**High fuel price-** With petrol prices surging past the century mark and diesel following a similar trend, common people are seeking ways to save money in this high-price market. Electric vehicles offer a great alternative to reduce fuel costs, making them an attractive option for many. This is one of the primary reasons for promoting the adoption of electric vehicles.

**Help to get a healthy economy**

India has traditionally relied on importing over 80 percent of its crude oil from foreign countries, which drains the country's foreign exchange reserves and leaves it heavily dependent on fossil fuels. By transitioning from traditional vehicles to electric vehicles, people can reduce their petrol consumption and contribute to improving the Indian economy.The Indian government is now actively promoting electric bikes, cars, and other electric vehicles, providing support to manufacturers in various ways. As a result, more companies are showing interest in starting their business in India, leading to an increased supply of electric vehicles. Through these efforts, the government is striving to improve the country's economic condition.

**To save the planet from the devastating environmental pollution**

In the recent times, the weather forecasting experts have been indicating the quality of air is being poor. Excessive carbon emissions are a significant cause of this problem. Poor air quality affects the respiratory system and can have many other negative effects. The Indian government has taken several initiatives to protect the planet and make it more habitable. The promotion of electric vehicles is a key part of this effort to create a greener environment.Many companies are also adopting eco-friendly methods to produce components for electric bikes and e-scooters in India. One such company is Amo Mobility, located in Noida, which is committed to using environmentally friendly processes to make their e-bikes and e-scooters.

The various initiative taken by the Indian Government to promote electric vehicles are given below-

a) GST on electric vehicles has been reduced from 12% to 5%.
b) GST on the charges or charging stations has been reduced from 18% to 5%.
c) The Ministry of power has released a notification for charging infrastructure standards to permit private charging at residences and offices.
d) The Ministry of Road Transport and Highways (MoRTH) announced to give green license plates for electric vehicles and these electric vehicles will be exempted from permit requirements.
e) MoRTH has been allowed 16 to 18 years to obtain a driving license to drive electric scooters.

Ministry of Heavy Industries formulated the Faster Adoption and Manufacturing of Hybrid and Electric Vehicle in India (FAME INDIA) scheme in 2015 for promoting the adoption of electric/hybrid vehicles. Recently the government has implemented phase-2 of the FAME INDIA scheme for a period of five years with Rs. 10,000 crores as budgetary support. The government of India has an aim to support the electrification of public transportation as well as provide support through subsidies, 7090- electric- buses, 10,00,000 electric two-wheelers, and 5,00,000 electric four-wheelers.So, these are some initiatives taken by the government of India to promote electric vehicles. The government is claiming to reach all-electric vehicles in India by 2050.

## BENEFITS OF ELECTRIC VEHICLES

Transportation is an essential aspect of modern life, but the traditional combustion engine is rapidly becoming obsolete. Petrol or diesel vehicles are highly polluting and are being swiftly replaced by fully electric vehicles. Fully electric vehicles (EVs) have zero tailpipe emissions, making them much better for the environment.

- Lower running costs
- Low maintenance cost
- Zero Tailpipe Emissions
- Tax and financial benefits
- Petrol and diesel use is destroying our planet
- Electric Vehicles are easy to drive and quiet
- Convenience of charging at home
- No noise pollution.

## CHALLENGES ASSOCIATED WITH EV

**Battery Manufacturing:** It is estimated that by 2020-30 India's cumulative demand for batteries would be approximately 900-1100 GWh. However, there is concern over the absence of a manufacturing base for batteries in India, leading to sole reliance on imports to meet rising demand. As per government data, India imported more than $1 billion worth of lithium-ion cells in 2021, even though there is negligible penetration of electric vehicles and battery storage in the power sector.

**Consumer Related Issues:** In 2018, India was reported to have only 650 charging stations, which is quite less than the neighboring counterparts who already had over 5 million charging stations.

- Lack of charging stations makes it unsuitable for the consumers in covering long range.
- Moreover, it takes up to 12 hours for a full charge of a vehicle at the owner's home using a private light-duty slow charger.
- Also, the cost of a basic electric car is much higher than the average price of a car running on conventional fuel.

**Policy Challenges:** EV production is a capital-intensive sector requiring long term planning to break even and profit realization, uncertainty in government policies related to EV production discourages investment in the industry.

**Lack of Technology and Skilled Labour:** India is technologically deficient in the production of electronics that form the backbone of the EV industry, such as batteries, semiconductors, controllers, etc. EVs have higher servicing costs which require higher levels of skills. India lacks dedicated training courses for such skill development.

**Unavailability of Materials for Domestic Production:** Battery is the single most important component of EVs. India does not have any known reserves of lithium and cobalt which are required for battery production. Dependence on other countries for the import of lithium-ion batteries is an obstacle in becoming completely self-reliant in the battery manufacturing sector.

## OPPORTUNITIES IN EV

**Electric Vehicle as Way Forward:** Electric vehicles (EVs) have the potential to significantly improve India's energy security situation, as the country currently imports over 80% of its crude oil requirements, costing approximately $100 billion. The push for EVs is also expected to play a crucial role in creating jobs within the local EV manufacturing industry. Furthermore, through various grid support services, EVs are anticipated to strengthen the grid and enable greater renewable energy penetration while maintaining secure and stable grid operation.

**Opportunities for Battery Manufacturing and Storage:** Recent technological advancements have created a significant opportunity for battery storage to promote sustainable development in India, particularly in light of the government's initiatives to encourage e-mobility and increase renewable power capacity to 450 GW by 2030. As per capita income rises, there is a growing demand for consumer electronics such as mobile phones, laptops, power banks, and UPS systems, which rely on advanced chemistry batteries. As a result, manufacturing advanced batteries has become one of the most significant economic opportunities of the 21st century.

**EV Charging Infrastructure:** The development of a robust charging infrastructure is critical for the widespread adoption of electric vehicles in India. The government has prescribed the installation of charging stations at various locations such as private residences, petrol pumps, commercial establishments, and public utilities like railway stations and bus depots. The Ministry of Power has mandated the presence of at least one charging station within a grid of 3 km and at every 25 km on both sides of the highways. Additionally, the Ministry of Housing and Urban Affairs has mandated the setting aside of 20% of the parking space for EV charging facilities in residential and commercial buildings under the Model Building Bye-laws, 2016. The implementation of these mandates will require state governments to introduce necessary amendments to their respective building bye-laws.

**Increasing R&D in EVs:** Collaborating with other countries can be beneficial for India's EV development. The UK has made significant strides in EV technology and can share knowledge and expertise with India. In addition, working with other countries can help India access new markets and technologies that can further boost the EV industry. By leveraging local research and development.

## ELECTRIC VEHICLES FUTURE IN INDIA

According to a recent survey, most Indian consumers expect electric vehicles (EVs) to be ready for the market by 2023. However, the majority also believe that they will not be widely available until 2025. Unlike buyers in other countries, Indian consumers are looking for EVs to be more affordable, with the global average tipping price being around $36,000 (approximately Rs. 27 lakh). One of the main factors driving up the cost of EVs is the lithium-ion batteries, which cost roughly $250/kWh worldwide, or approximately Rs. 5.7 lakh for the batteries alone. Currently, the cost of lithium-ion batteries accounts for half of the cost of an EV, making them more expensive than traditional gasoline-powered vehicles. In addition, there are concerns about the safety of lithium-ion batteries, which have been known to explode in some cases.

Charging infrastructure is also a significant barrier to EV adoption in India. The lack of charging stations in the country makes long-distance travel impractical or significantly less feasible. Additionally, some EVs may not be as fast as their gas-powered counterparts, which could be a concern for some consumers.

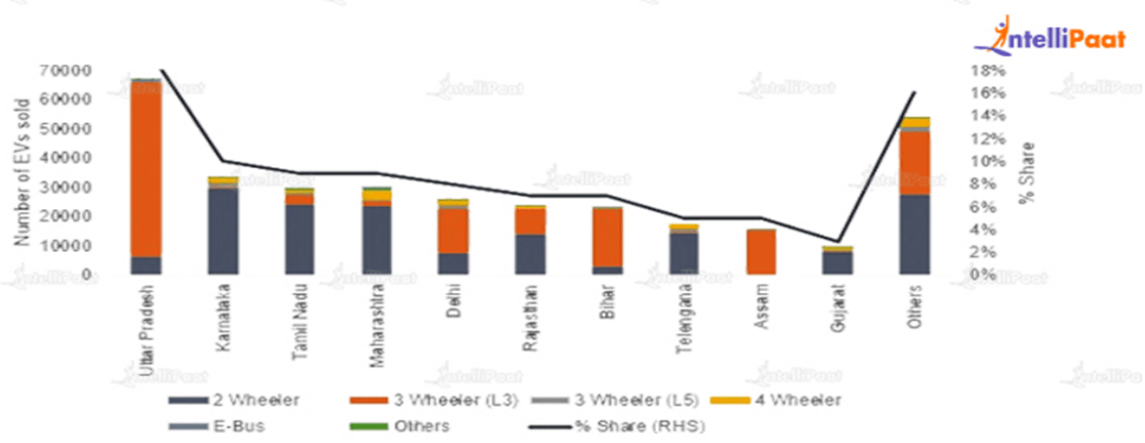
Despite these challenges, India has an opportunity to take a leadership role in the global transition to sustainable mobility by embracing EVs. As many countries are working to reduce carbon emissions and combat climate change, India can make significant progress towards a greener and cleaner ecosystem by promoting the adoption of EVs.

## ELECTRIC VEHICLES MARKET SHARE IN INDIA

The Indian automobile industry is currently the world's fifth largest and is expected to become the third largest by 2030. According to the India Energy Storage Alliance (IESA), the Indian electric vehicle (EV) market is projected to grow at a compound annual growth rate (CAGR) of 36%. As India's population continues to grow and demand for automobiles increases, the country's reliance on conventional energy sources is no longer sustainable. India currently imports over 80% of its crude oil, making it vulnerable to price fluctuations and supply disruptions.

To address these challenges, the National Institution for Transforming India (NITI Aayog) has set ambitious targets for the adoption of EVs. By 2030, they aim to achieve 70% EV market penetration for all commercial vehicles, 30% for private vehicles, 40% for buses, and 80% for two and three-wheelers. These targets are consistent with the goal of reaching net zero carbon emissions by 2070.

The Indian electric vehicle market was valued at USD 1,434.04 million in 2021, and it is expected to grow at a CAGR of 47.09% during the forecast period (2022-2027) to reach USD 15,397.19 million by 2027. With the government's commitment to promoting the adoption of EVs and the increasing demand for sustainable mobility solutions, the Indian EV market is poised for significant growth in the coming years.



In India, Uttar Pradesh led the country in electric vehicle (EV) sales in 2021, with 66,704 units sold across all categories. Karnataka and Tamil Nadu followed closely with 33,302 units and 30,036 units, respectively. Uttar Pradesh dominated the three-wheeler category, while Karnataka and Maharashtra led the two-wheeler and four-wheeler segments, respectively.

The Indian government's planned transition to EVs is expected to reduce carbon emissions by 37% by 2030. To achieve this, the deployment of EVs must encompass all types of vehicles on Indian roads. Besides carbon emissions, diesel and gasoline vehicles also emit harmful air pollutants. In contrast, EVs produce no tailpipe emissions, eliminating dangerous air pollutants such as carbon monoxide, nitrogen oxide, and particulate matter. According to the World Health Organization, 13 of the world's top 20 cities with the worst air pollution are in India. The adoption of EVs is expected to significantly improve air quality in these cities.
With better grid electricity and infrastructure, EVs have the potential to become a viable option for urban mobility. By reducing carbon emissions and air pollution, EVs can help create cleaner and healthier cities in India.

**STATE-WISE SUBSIDY FOR ELECTRIC VEHICLES IN INDIA**

| **State** | **Per kWh of battery capacity** | **Max Subsidy** | **Road Tax Exemption** |
|---|---|---|---|
| Andhra Pradesh | No | No | 100% |
| Delhi | Rs 5,000 | Rs 30,000 | 100% |
| Maharashtra | Rs 5,000 | Rs 25,000* | 100% |
| Kerala | No | No | 50% |
| Uttar Pradesh | No | No | 100% |
| Odisha | NA | Rs: 5,000 | 100% |
| Assam | Rs 10,000 | Rs 20,000 | 100% |
| Gujarat | Rs 10,000 | Rs 20,000 | 50% |
| Bihar | Rs 10,000 | Rs 20,000 | 100% |
| Meghalaya | Rs 10,000 | Rs 20,000 | 100% |
| Rajasthan | Rs 2,500 | Rs 10,000 | NA |
| West Bengal | Rs 10,000 | Rs 20,000 | 100% |
| Karnataka | No | No | 100% |
| Tamilnadu | No | No | 100% |
| Telangana | No | No | 100% |
| Madhya Pradesh | No | No | 99% |
| Punjab | No | No | 100% |

Under their rules, states like as Andhra Pradesh, Karnataka, Madhya Pradesh, Telangana, Tamil Nadu, Uttarakhand, Punjab, and Uttar Pradesh do not provide any direct subsidies to electric two-wheeler customers.Road tax for electric cars is totally eliminated in most states where the program has been implemented, with the exception of Gujarat and Kerala, where buyers must pay 50% of the total road tax amount.

Meghalaya, Assam, Gujarat, and West Bengal provide a greater per kWh subsidy of Rs 10,000, with a total subsidy available of Rs 20,000. Bihar's EV policy, which has yet to be authorized, promises comparable advantages. Rajasthan provides a subsidy of Rs. 5,000 for two-wheelers with a battery capacity of 2 kWh and up to Rs. 10,000 for those with a battery capacity of 5 kWh or above. Odisha, on the other hand, grants a Rs. 5,000 fixed subsidy.

## CONCLUSION

With the ever increasing population and need for transport facilities increasing day by day air pollution is a major issue in cities.Therefore, it is crucial to convert conventional vehicles to electric vehicles as they are environmentally friendly and can reduce pollution levels. The Indian government is committed to achieve this transition as soon as possible, as promoting electric vehicles can help replenish the environment, creating a better world for future generations. In addition to being environmentally friendly, the adoption of electric vehicles aligns with broader trends of electrification and decarbonisation, while also synergistically integrating with mobility changes such as urban micro-mobility, automation, and mobility-as-a-service solutions. The effective integration of electric vehicles into power systems offers numerous opportunities for synergistic improvement of the efficiency and economics of electro-mobility and electric power systems. Electric vehicles can also support power-system planning and operations in several ways. As the future of transportation, manufacturing businesses are increasingly transitioning from traditional automobiles to electric vehicles, reflecting the importance of sustainable and environmentally responsible practices.

## References


- https://intellipaat.com/blog/future-of-electric-vehicles-in-india.
- https://www.thehindubusinessline.com/opinion/sustainable-mobility-role-of-evs-in-achieving-sdgs/article34973747.ece
- MS Chugh in Voices, Business, TOI- Electric vehicle industry vision for the future, November 24, 2022.
- Rujuta O. Kambli, Electric Vehicles in India: Future and Challenges, DOI Link: https://doi.org/10.22214/ijraset.2022.40297.
- https://intellipaat.com/academy/
- https://powermin.gov.in/en/content/electric-vehicle
- https://www.grandviewresearch.com/industry-analysis/india-electric-vehicle-market-report/methodology.
- Anil Khurana anil.khurana@me.com, V. V. Ravi Kumar, and Manish SidhpuriaA Study on the Adoption of Electric Vehicles in India: The Mediating Role of Attitude,Volume 24, Issue 1https://doi.org/10.1177/0972262919875548.
- https://www.thehindubusinessline.com/opinion/sustainable-mobility-role-of-evs-in-achieving-sdgs/article34973747.ece.

- Menonjyoti Kalita1 1Assistant Professor, Golam Imran Hussain2 2Assistant Professor, Jorhat Institute of Science & Technology, Jorhat (Assam)- 10, International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org
- Mohamed M1*, G Tamil Arasan1 and G Sivakumar21Department of Electrical and Electronics Engineering Panimalar Engineering College Chennai, India Department of Chemistry Panimalar Engineering College Chennai, India, Study on Electric Vehicles in India Opportunities and Challenges, February 2018,DOI:10.15226/2572-3162/3/1/00115, Project: impact of gst in nbfc.
- A review on barrier and challenges of electric vehicle in India and vehicle to grid optimisation, Author links open overlay panelSonaliGoel a, Renu Sharma a, Akshay Kumar RathorebTransportation Engineering, Volume 4, June 2021, 100057.