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Air pollution has grown to be a major issue for India in the current situation. Numerous Indian towns are among the most polluted in the world, according to a recent survey. Transport and industrial sectors are the two main sources of air pollution. The industrial sector is responsible for 51% of this air pollution, and the transportation sector is responsible for 27%. 2 million Indians die prematurely each year as a result of air pollution. 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. Even nevertheless, there are many dangers to the development of electric

vehicles in India. The researcher employed secondary data analysis to examine trends in electric car sales and market share between the fiscal years 2014–15 and 2022–2023.

Keywords: E-Vehicle, Sales, Industry, Electric.



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1. INTRODUCTION

The majority of nations throughout the world are considering including electric vehicles (EVs) as part of their transportation policies. However, these nations' responses are influenced by their economic development stage, access to energy resources, technological prowess, and political commitment to prioritizing addressing climate change challenges. The more developed a country is, the more likely it is to adopt EVs. Over the past few decades, India's population, urbanization, and wealth have grown quickly, which has altered its residents' mobility. According to World Bank figures published by NITI Aayog, India's transport demand has increased by over 8 times since 1980, more than any other Asian economy. While this has helped the country's auto sector grow significantly on the one hand, it has also highlighted the potential for the environment to suffer permanent harm. Ten electric vehicles are currently available for purchase in India. The cheapest of these is the MG Comet EV, while the most expensive electric vehicle sold in India is the BMW i7. Among the upcoming electric vehicles in India are the Mahindra Thar E, the Audi Q8 e-tron, and the Volvo C40 Recharge. Search your city for a charging station. Under the FAME India initiative phase II, the Department of Heavy Industries has additionally approved 2636 charging stations in 62 cities across 24 States/UTs. State-wise allocation of these charging stations is as follows: (70) ChandigarhJammu Kashmir (25) Himachal Pradesh (10) Sikkim (29) Uttrakhand (10)Uttar Pradesh (207) Assam (25) Meghalaya (40) (205) Rajasthan (228) Gujarat (159) Madhya Pradesh West Bengal (141) Odisha (18) Chhattisgarh (25) (317) Maharashtra Telangana (138) Andhra Pradesh (266) (172) Karnataka (131) Kerala (256) Tamil Nadu (37) Bihar (72) Delhi (10) Puducherry (50) HaryanaPort Blair (10)

1.1. There are four types of electric vehicles available:

1) **Battery Electric Vehicle (BEV):** Fully powered by electricity. These are more efficient compared to hybrid and plug-in hybrids.

2) Hybrid Electric Vehicle:

- a. Hybrid Electric Vehicle (HEV): The vehicle uses both the internal combustion (usually petrol) engine and the battery-powered motor power train. The petrol engine is used both to drive and charge when the battery is empty. These vehicles are not as efficient as fully electric or plug-in hybrid vehicles.
- b. Plug-in Hybrid Electric Vehicle (PHEV): Uses both an internal combustion engine and a battery charged from an external socket (they have a plug). This means the vehicle's battery can be charged with electricity rather than the engine. PHEVs are more efficient than HEVs but less efficient than BEVs.
- 3) **Fuel Cell Electric Vehicle (FCEV):** Electric energy is produced from chemical energy. For example, a hydrogen FCEV.

2. REVIEW OF LITERATURE

Dr. Savita M. Rau (2022) Since they were first developed more than a century ago, hybrid, plug-in hybrid, and all-electric vehicles are now available. The demand for electric vehicles is growing as gas and diesel costs soar and as customers' interest in these electric vehicles increases due to technology advancements. This research focused on the current trend of e-vehicle sales in India and Maharashtra. Data were examined using secondary data. This study

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examined the rise in electric car sales and the percentage of electric vehicles compared to other fuelpowered vehicles from the financial years 2013–14 to 2021–22. Julio A. Sanguesa, et.al (2021): The paper "A Review on Electric Vehicles: Technologies and Challenges" examined the various EV models, the technology employed, the benefits compared to internal combustion engine vehicles, the evolution of sales over the past few years, as well as alternative charging methods and potential future developments. They came to the conclusion that the EV will be crucial to the development of Smart Cities in the future, with various charging options that can be tailored to the needs of the user. Future BMS should therefore take into account the new scenarios brought about by new batteries and the demands of Smart Cities. Omkar Tupe 2020 in conclusion, there is a need for an energy transition in automobiles in India due to the depletion of fossil fuels and the ongoing increase in fuel prices. Government has taken initiative to fight pollution levels by promoting EVs and giving subsidies on purchase. To boost its production, Government has eased the FDI norms. Various emerging brands are launching EVs in India. The Government and manufacturers should join their hands to build the infrastructure and create positive environment for EVs.

3. OBJECTIVES OF THE STUDY

- To analyse the sales growth of Electric Vehicles in India and Tamil Nadu.
- To examine the EV and fuel vehicle in Tamil Nadu.

4. RESEARCH METHODOLOGY

The study is supported by secondary data. Information has been gathered from a number of websites, academic articles, and newspapers. Analyzed data is displayed with a percentage growth rate. The study concentrated on the development and sales of electric vehicles in Tamil Nadu. The time frame covered the years 2014–2015 to 2022–2023.

5. ELECTRIC VEHICLE INCENTIVES

The purchasing an electric vehicle is costlier than buying an internal combustion engine vehicle, but that is only because of the higher upfront cost. Effective cost over the lifetime for electric vehicles is still less. The government offers different types of financial incentives to make electric vehicles more affordable for you. The key mechanisms for getting incentives are:

- Purchase Incentives: Direct discount provided to the user on the cost of the electric vehicle
- Coupons: Financial incentive where the amount is reimbursed later
- Interest Subventions: Discount offered on the interest rate while availing loan

- **Road tax exemption:** Road tax at the time of purchase is waived off
- **Registration fee exemption:** One-time registration fee applicable on new vehicle purchase is waived off
- > **Income tax benefit:** Provided as a deduction on the tax amount payable by an individual to the government

6. ANALYSIS AND INTERPRETATION

- > Scrapping incentives: Provided upon deregistering old Petrol and Diesel Vehicles
- > **Others:** Incentives such as interest-free loans, top-up subsidies, special incentives on electric three-wheelers, etc. can also be availed.

Table-1: Sales Trend of Electric venicles in India								
Year	Other fuel	EV	Growth of EV	Growth of				
	vehicles			share of EV %				
2014-15	17509284	2357	-	0.013461				
2015-16	18248992	17932	6.607976	0.098263				
2016-17	19473645	56796	2.167299	0.291656				
2017-18	21416617	97571	0.71792	0.455585				
2018-19	22575986	146905	0.505622	0.650714				
2019-20	21867427	168320	0.145774	0.769729				
2020-21	15350054	134853	-0.19883	0.878518				
2021-22	16450373	429447	2.184557	2.610561				
2022-23	21127448	1183142	1.755036	5.600023				

Table 1. Sales Trend of Electric Vehicles in India

Source: https://vahan.parivahan.gov.in/vahan4dashboard

The above table displays the percentage of electric vehicles compared to other fuel vehicles as well as the annual growth rate of electric vehicles in India from 2014-15 to 2022-23. Electric vehicle sales increase was not steady. The years 2015-16, 2016-17, and 2021–22 saw the highest sales growth percentages of 6.60, 2.16, and 2.18, respectively. Due to the Covid-19 pandemic and lockdown, sales dropped in 2020.

Lockouts and job cuts in cities after March 2020 had a detrimental influence on EV segment production and sales. From 2014-15 to 2022-23, the percentage of electric vehicles compared to conventional fuels climbed steadily. Due to rising prices for conventional fuels like gasoline and diesel, electric car adoption peaked around 2021-2022.

YEAR	EV IN INDIA	EV IN TAMILADU	HYBRID IN (EV & FUEL)	GROWTH OF EV	GROWTH OF SHARE OF
			TAMILNADU		EV %
2014-15	2357	157	2	-	6.66101
2015-16	17932	81	6	-0.48408	0.451706
2016-17	56796	90	14	0.111111	0.158462
2017-18	97571	130	155	0.444444	0.133236
2018-19	146905	2195	4929	15.88462	1.494163
2019-20	168320	4199	2434	0.912984	2.494653
2020-21	134853	11937	18	1.84282	8.851861
2021-22	429447	39624	9	2.319427	9.22675
2022-23	1183142	71844	123	0.813144	6.072306
2023-24	534753	35251	49		
*(Till date					
only)				- 50934	6.592015

Table-2: Sales Trend of Electric Vehicles in Tamilnadu

Source: https://vahan.parivahan.gov.in/vahan4dashboard

The above table displays the annual growth rate for electric vehicles in India from 2014–15 to 2022–23 as well as their percentage of the market compared to other fuel-powered vehicles. The years 2018–19 and 2021–22 will have the highest sales growth rates, at 15.88 and 2.3 percentage points, respectively. Due to the Covid-19 pandemic and lockdown, sales dropped in 2020. Lockouts and job cuts in cities after March 2020 had a detrimental influence on EV segment production and sales. From 2014–15 to 2022–23, the percentage of electric vehicles compared to conventional fuels climbed steadily. Due to rising prices for conventional fuels like gasoline and diesel, electric car adoption peaked around 2021–2022.

8. CONCLUSION

At the UNFCC COP26, India declared an extremely ambitious goal to achieve net zero by 2070. Electric vehicles (EVs) are essential to achieving this aim. The entire environmental impact of electric vehicles is dependent on the source of the power needed to charge them, even though EVs themselves have no exhaust emissions. The environmental advantages are increased if the electricity is produced using renewable resources like solar or wind. In India's economy, the automobile industry is extremely important. The future of the Indian automobile industry lies with electric vehicles. The best alternatives to lessen reliance on foreign imports of fossil fuels and environmental impact are electric automobiles. Electric car models continue to compete poorly in the market with traditional vehicle types. With the price of fossil fuels rising, consumer confidence and popularity rising, consumer awareness of the environmental impact of conventional vehicles rising, and the "scheme and policies" put forth by the government for promoting electric vehicles, the sales of electric vehicles will rise in the Indian market.

REFERENCES

- Raut, S. M. (2022). A Study of Sales Trend of E-vehicles in India and Maharashtra.
- Meisel, S., & Merfeld, T. (2018). Economic incentives for the adoption of electric vehicles: A classification and review of e-vehicle services. *Transportation Research Part D: Transport and Environment, 65,* 264-287.
- Alia, M. M., & Deshmukh, A. A. (2022). E-vehicle: Literature review. *International Management Review*, 18(2), 87-92.
- Cabrera-Tobar, A., Blasuttigh, N., Massi Pavan, A., Lughi, V., Petrone, G., & Spagnuolo, G. (2022). Energy scheduling and performance evaluation of an evehicle charging station. *Electronics*, *11*(23), 3948.
- Alagarsamy, M., Kasinathan, P., Manickam, G., Duruvarajan, P. R., Sakkarai, J., & Suriyan, K. (2022). IoT based E-vehicle monitoring system using sensors and imaging processing algorithm. *Int J Reconfigurable* & Embedded Syst ISSN, 2089(4864), 4864.
- Kurien, C., Srivastava, A. K., & Molere, E. (2020). Emission control strategies for automotive engines with scope for deployment of solar based e-vehicle charging infrastructure. Environmental Progress & Sustainable Energy, 39(1), 13267.
- https://vahan.parivahan.gov.in/vahan4dashboard/vahan/v ahan/view/reportview.xhtml.

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