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# A COMPARATIVE ANALYSIS ABOUT EV VS PETROL CARS

# AVINASH KP<sup>1</sup>, GUNASEKARAN B<sup>2</sup>

<sup>1</sup> Sri Krishna Adithya College Of Arts And Science, Coimbatore.

<sup>2</sup>Department/Faculty, Sri Krishna Adithya College Of Arts And Science, India.

#### ABSTRACT :

This study presents a comparative analysis of electric vehicles (EVs) and petrol-powered cars, focusing on key aspects such as environmental impact, cost efficiency, performance, and maintenance. As global concerns about climate change and fossil fuel dependence intensify, EVs are increasingly being viewed as a sustainable alternative to traditional internal combustion engine vehicles. The analysis draws on recent data, consumer trends, and technological advancements to evaluate the benefits and limitations of both vehicle types. Findings indicate that while EVs offer significant environmental advantages and lower long-term operating costs, petrol cars currently retain benefits in terms of infrastructure availability and initial purchase price. This paper aims to inform consumers, policymakers, and manufacturers by providing a balanced overview of both technologies, ultimately contributing to informed decision-making in the transition toward sustainable transportation.

KEYWORDS: Electric vehicles, Petrol cars, Comparative analysis, Environmental impact, Fuel efficiency

## INTRODUCTION

The global automotive industry is undergoing a significant transformation as electric vehicles (EVs) gain popularity over traditional petrol-powered cars. With growing concerns about climate change, rising fuel prices, and advancements in battery technology, EVs are increasingly seen as a sustainable alternative to internal combustion engine (ICE) vehicles. This research aims to compare EVs and petrol cars in terms of environmental impact, cost efficiency, performance, and infrastructure.

#### **OBJECTIVES OF THE STUDIES**

- To compare the environmental impact of EVs and petrol cars by assessing carbon emissions, energy consumption, and sustainability.
- To evaluate the economic feasibility of both vehicle types, considering initial purchase costs, maintenance, fuel/charging expenses, and long-term savings.
- To analyze the performance differences between EVs and petrol cars, including factors such as speed, acceleration, efficiency, and durability.

#### **RESEARCH AND METHODOLOGY**

#### **Research Design**

The study follows a comparative research design, aiming to analyze the differences and similarities between EVs and petrol cars in terms of sustainability, economic feasibility, and user preferences. It includes data collection from existing literature, industry reports, government policies, and consumer surveys.

#### Data Collection Methods

- 1. Secondary Data Analysis This involves reviewing research papers, market reports, government regulations, and statistical data from automotive and environmental agencies.
- 2. Surveys and Questionnaires A structured survey will be conducted to gather consumer opinions on EVs and petrol cars, focusing on factors such as cost, convenience, performance, and environmental concerns.
- 3. Case Studies Real-world case studies from countries with high EV adoption (e.g., Norway, China, and the U.S.) will be examined to understand the factors influencing EV growth.

#### Sampling Method

A random sampling technique will be used to ensure a diverse group of respondents. The sample population will include:

- Car owners (both EV and petrol users) To understand their experiences, preferences, and challenges.
- Potential buyers To analyze their willingness to switch to EVs.
- Industry experts and policymakers To gain insights into the future of EV adoption and government policies.

#### Sample Size

The study aims to survey 159 respondents from urban and suburban areas to ensure a balanced perspective on EV and petrol car adoption. Additionally, 5-10 industry experts will be interviewed for qualitative insights.

### LITERATURE REVIEW

- Bauer et al. (2015)<sup>8</sup> also supported this finding, noting that the environmental benefits of EVs increase as the electricity grid becomes greener.
- Peterson et al. (2015)<sup>9</sup> found that while EVs have higher upfront costs, their lower operating and maintenance costs make them more economical over time.
- Hagman et al. (2016)<sup>10</sup> highlighted the role of government incentives in reducing the TCO of EVs, making them competitive with petrol cars.
- Wu et al. (2015)<sup>11</sup> demonstrated that EVs have significantly lower fuel costs compared to petrol cars, especially in regions with low electricity prices.
- Needell et al. (2016)<sup>12</sup> noted that EVs require less maintenance due to fewer moving parts, further reducing long-term costs.

## DATA AND ANALYSIS

Age	No. of. Respondents	Percentage
18-25	64	40.3
26-35	62	39
36-45	30	18.9
46-55	3	1.9
56+	0	0
Total	159	100

TABLE 1 AGE OF THE RESPONDENTS

#### Interpretation:

The table shows that the majority of respondents (40.3%) are aged 18-25, followed by 26-35 (39%). Fewer respondents fall in the 36-45 (18.9%) and 46-55 (1.9%) age groups, with none above 56.

 TABLE 2

 VEHICLE OWNERSHIP STATUS OF THE RESPONDENTS

OWN A VEHICLE	No. of. Respondents	Percentage
Yes, an electric vehicle	45	28.3
Yes, a petrol or diesel car	76	47.8
No, but I plan to buy one	35	22
No, and I don't plan to buy one	3	1.9
TOTAL	159	100

**Interpretation:** The table indicates that most respondents (47.8%) own a petrol or diesel car, while 28.3% own an electric vehicle. Additionally, 22% do not own a vehicle but plan to buy one, whereas only 1.9% have no plans to purchase a vehicle

#### FINDINGS

- 1. The most of respondents are aged 18-25 (40.3%) and 26-35 (39%).
- 2. Most respondents own a petrol or diesel car (47.8%), followed by electric vehicle owners (28.3%).
- 3. Performance and efficiency (96.9%) are the most influential factors in vehicle purchase decisions, followed by cost (56.6%).
- 4. The majority (66.7%) are somewhat concerned about vehicle-related carbon emissions.
- 5. Most (45.3%) respondents disagree or strongly disagree that EVs are environmentally friendly.

#### SUGGESTIONS

To encourage the adoption of EVs, expanding charging infrastructure is crucial to address accessibility concerns and support widespread use. Governments should introduce more incentives such as tax breaks and subsidies to reduce the high upfront costs of EVs, making them more financially attractive. Additionally, advancements in battery technology should be prioritized to improve battery range, reduce replacement costs, and enhance overall energy efficiency. Public awareness campaigns should also be implemented to educate consumers on the long-term cost benefits and environmental advantages of EVs. Lastly, automakers should focus on improving EV performance, particularly in speed, acceleration, and durability, to match or exceed the expectations set by petrol cars.

#### CONCLUSIONS

In conclusion, the comparison between EVs and petrol cars highlights key differences in environmental impact, economic feasibility, performance, infrastructure, and consumer perception. EVs offer significant environmental benefits by reducing carbon emissions and dependence on fossil fuels, making them a sustainable choice for the future. However, their adoption is hindered by high initial purchase costs, concerns about battery life and replacement costs, and limited charging infrastructure. While EVs are perceived to have better performance in certain aspects, petrol cars are still considered more practical by many consumers due to their affordability and widespread refueling network. Expanding charging infrastructure, offering government incentives, and improving battery technology are essential steps to enhance the feasibility of EVs. As technology advances and the global push for sustainability strengthens, EVs have the potential to become the dominant mode of transportation, provided that economic and infrastructural challenges are effectively addressed.

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