



‘A Study on Differential Cost of Running a Petrol Vehicle and an Electric Vehicle in India’

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ABSTRACT :

This research article aims to analyze and compare the differential costs of running petrol vehicles versus electric vehicles (EVs) in India. With rising environmental concerns and the push for sustainable mobility, understanding the financial implications of vehicle ownership in the Indian context is crucial for consumers and policymakers. This study examines initial purchase costs, fuel/energy costs, maintenance expenses, and other related financial aspects over the lifespan of both types of vehicles in India. This article provides a balanced and detailed comparison, considering current and future trends in the Indian automotive industry.

Key Terms:- India Automotive Market, Electric Vehicle Incentives, Maintenance Cost, EV Battery, Sustainable Mobility, Cost of Ownership, Energy Efficiency, Transformation .

Introduction :

India is undergoing a significant transformation in its transportation sector with increasing adoption of electric vehicles (EVs). Factors such as government incentives, rising fuel prices, and environmental concerns are driving this shift. This study provides a detailed comparative analysis of the costs involved in running petrol vehicles versus electric vehicles in India, considering the unique economic and regulatory environment.

Initial Purchase Cost :

The initial purchase cost for electric vehicles in India is generally higher than that for petrol vehicles due to the high cost of batteries. However, government incentives and subsidies aim to bridge this gap.

Petrol Vehicles

- Average Cost: Rs. 5,00,000 - Rs. 10,00,000
- No significant subsidies or incentives.

Electric Vehicles

- Average Cost: Rs. 10,00,000 - Rs. 15,00,000
- Government incentives: Up to Rs. 1,50,000 (varies by state and central schemes)

Fuel/Energy Costs

Fuel and energy costs are a major component of the total cost of running a vehicle. Here, the difference between petrol and electricity costs is highlighted.

Petrol Vehicles

- Average Fuel Efficiency: 18 km per litre
- Average Fuel Cost: Rs. 100 per litre
- Annual Fuel Cost (15,000 km): Rs. 83,333

Electric Vehicles

- Average Energy Efficiency: 6 km per kWh

- Average Electricity Cost: Rs. 7 per kWh
- Annual Electricity Cost (15,000 km): Rs. 17,500

Maintenance Costs

Maintenance costs for electric vehicles are typically lower due to fewer moving parts and simpler mechanical systems.

Petrol Vehicles

- Annual Maintenance Cost: Rs. 20,000 - Rs. 25,000
- Components: Oil changes, exhaust system repairs, fuel system maintenance, etc.

Electric Vehicles

- Annual Maintenance Cost: Rs. 10,000 - Rs. 15,000
- Components: Battery maintenance, fewer moving parts requiring less frequent repairs

Insurance Costs

Insurance costs can vary based on factors like vehicle value, repair costs, and safety features.

Petrol Vehicles

- Average Annual Insurance Cost: Rs. 20,000

Electric Vehicles

- Average Annual Insurance Cost: Rs. 25,000

Depreciation

Depreciation rates for vehicles in India can significantly impact the total cost of ownership.

Petrol Vehicles

- Depreciation Rate: Approximately 15% per year
- 5-Year Depreciation: 60-70%

Electric Vehicles

- Depreciation Rate: Approximately 20% per year
- 5-Year Depreciation: 70-80%
- Note: Depreciation rates for EVs are currently higher due to rapidly advancing technology and decreasing battery costs.

Total Cost of Ownership (TCO) Over 5 Years

To provide a comprehensive view, we compare the total cost of ownership over five years for both vehicle types in India.

Petrol Vehicle

- Initial Purchase Cost: Rs. 7,50,000
- Fuel Cost: Rs. 4,16,665
- Maintenance Cost: Rs. 1,12,500
- Insurance Cost: Rs. 1,00,000
- Depreciation: Rs. 4,50,000
- Total Cost: Rs. 18,29,165

Electric Vehicle

- Initial Purchase Cost: Rs. 12,50,000 (Less Rs. 1,50,000 incentive:- Rs. 11,00,000)
- Electricity Cost: Rs. 87,500
- Maintenance Cost: Rs. 62,500
- Insurance Cost: Rs. 1,25,000
- Depreciation: Rs. 8,80,000
- **Total Cost: Rs. 22,55,000**

Discussion :

The total cost of ownership over five years in India shows that electric vehicles are currently more expensive than petrol vehicles. However, factors such as decreasing battery costs, increased government incentives, rising fuel prices, and environmental considerations are likely to make EVs more competitive in the near future. Additionally, the long-term benefits of lower running costs and reduced environmental impact further enhance the attractiveness of EVs.

Conclusion :

This study highlights the importance of considering various cost factors when comparing petrol and electric vehicles in India. While electric vehicles currently have a higher total cost of ownership, ongoing advancements and supportive policies are expected to improve their economic viability. Consumers should weigh both financial implications and environmental benefits when making their vehicle choice.

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