



FINANCIAL IMPACT OF EV TRANSITION ON BHUBANESHWAR'S AUTO AND FUEL SECTOR

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ABSTRACT :

The shift towards electric vehicles (EVs) presents significant financial challenges and opportunities for the traditional fuel industry. This research paper investigates the financial impact of EV adoption on petrol stations in Bhubaneswar, Odisha. The study examines how declining fuel demand, evolving consumer behavior, and government policies affect the revenue, investment decisions, and long-term sustainability of fuel stations. By literature review, owner interviews at fuel stations, and a focused survey of EV and non-EV users, the study reveals important findings on business adaptation strategies and diversification needs, including EV charging facilities. The study emphasizes the imperative for strategic planning and financial assistance to counter revenue loss and business resilience. The research ends with policy and industry stakeholders' recommendations to facilitate the transition while protecting the profitability of fuel retailers.

INTRODUCTION

The electric vehicle (EV) transition is transforming the fuel retail sector's dynamics, bringing both financial threats and strategic possibilities for conventional fuel stations. With changing consumer preferences and government policies favoring cleaner energy options, petrol stations are experiencing a slow decline in traditional fuel demand. This changing scenario requires greater insight into how such change affects the financial sustainability and business models of fuel retailers. The current study targets the estimation of the financial effect of EVs on petrol pumps in Bhubaneswar, Odisha. Through the analysis of variables like revenue loss, investment in infrastructure, business transformation, and policy-making, the study seeks to present insightful findings on how fuel stations can adapt through the change while remaining financially viable.

1.1 Research Aims

1. To evaluate the impact of increasing EV usage on revenue and profitability of fuel stations in Bhubaneswar.
2. To evaluate the scope and determinants driving consumer shift from fossil fuel-based vehicles to electric vehicles in Bhubaneswar.
3. To determine the infrastructure and financial changes fuel stations must undergo to support electric vehicles
4. To analyze the strategic responses and adaptation strategies of fuel stations in response to changing consumer tastes towards electric mobility.
5. To assess the overall financial implications of electric vehicle uptake on the operational sustainability of conventional fuel stations.

2.0 LITERATURE REVIEW

Changing Consumer Tastes and Financial Impacts (Singh & Kumar, 2021):

As per Singh and Kumar (2021), shifting consumer preferences—particularly among young, environmentally conscious car owners—have a direct monetary effect on fuel stations. The research indicates that decreased reliance on petrol and diesel means lower sales volumes, necessitating business diversification. This observation supports the notion that consumer trends have a significant influence on the financial performance of fuel stations.

Role of Government Incentives in Business Adaptation (Mehta & Sharma, 2019):

Mehta and Sharma (2019) analyzed how policies influence the willingness of petrol stations to adopt EV-related transformations. Their study shows that money, in the form of subsidy or tax rebate for EV infrastructure, plays an essential role for small enterprises bearing the cost of transition. Incentives have the ability to relieve financial strain and promote rapid adaptation, with policy being the major driver of sustainable transformation.

3.0 RESEARCH METHODOLOGY

3.1 Area of Study

The research is carried out in different industries with a mix of workforce composition in the firms. The research is intended to examine the effects of pay equity on employee motivation, job satisfaction, and employee retention, but not confined to one industry. The research will examine employee views of fairness in remuneration and its impact on workplace morale.

3.2 Sample of Study

132 people across various industries and occupations are chosen for the study. The sample consists of individuals of different ages, experience, and occupations to ensure a comprehensive understanding of the impact of pay equity on motivation in various working environments.

3.3 Sampling Technique

Random and convenient sampling techniques were used in this research to recruit participants, which enabled effective data collection while facilitating access to a diverse sample population.

3.4 Type of Study

This research utilizes a quantitative, cross-sectional survey design, with a structured questionnaire used to collect data from consumers at one point in time. The research will examine the relationship between equitable pay, motivation, and job satisfaction and evaluate the effect of pay transparency on employee engagement and retention.

3.5 Data Collection Tools

The data will be gathered through a guided multiple-choice questionnaire (MCQ) that is meant to evaluate employees' beliefs about pay fairness, its effects on motivation and job performance, and the influence of pay inequity on job satisfaction and turnover. The questionnaire will also investigate the function of pay transparency in building trust and motivation.

3.6 Method of Analysis

The data is analyzed by quantitative methods. Statistical tools like percentages and graphical means (bar graphs, pie charts, and histograms) are employed to determine trends in employee feedback. The findings will give insights into how compensation equity has an effect on staff motivation, satisfaction, and stability in the workforce, enabling organizations to grasp the value of equitable compensation design.

4.0 LIMITATIONS OF STUDY

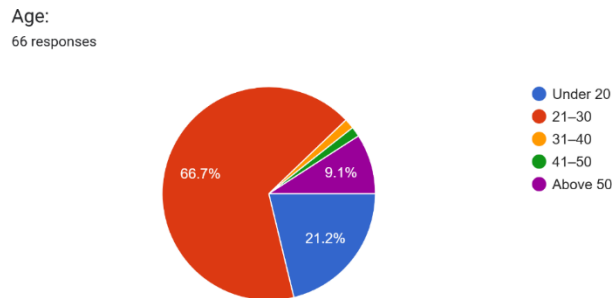
1. **Subjective Consumer Views** – Answers draw on personal opinions, which can differ from true financial effects or industry facts.
2. **Geographical Restriction** – Bhubaneswar is the location where research is conducted, so results could not be generalized to other cities or areas with varying rates of EV adoption.
3. **Possible Response Bias** – Respondents might have filled in answers they perceived as anticipated or socially correct, influencing objectivity of findings.
4. **Limited Diversity of Samples** – The sample group might not be representative of all stakeholder groups, including fuel station owners, government administrators, or automobile manufacturers.
5. **Lack of Longitudinal Data** – The research takes a snapshot at a point in time and does not account for changing trends or long-term effects of the adoption of EVs.

5.0 ANALYSIS AND INTERPRETATION

This research explores the economic impact of increasing the use of electric vehicles (EVs) on the conventional fuel retail industry in Bhubaneswar. A systematic questionnaire was distributed among 135 respondents, both EV users and non-EV users, in order to understand their usage habits, fuel demand, and views regarding the transition towards electric mobility. The answers provide good indications of changes in fuel demand, possible loss of revenue for fuel stations, and the willingness of companies to invest in EV infrastructure. The study seeks to reveal emerging trends and gain a better understanding of how the fuel sector can embrace this shift.

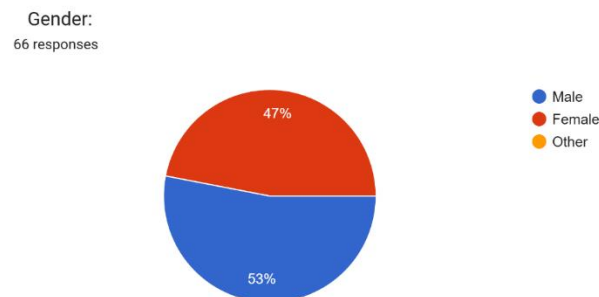
5.1 Graphical Representation and Interpretation of Data

1. AGE GROUP



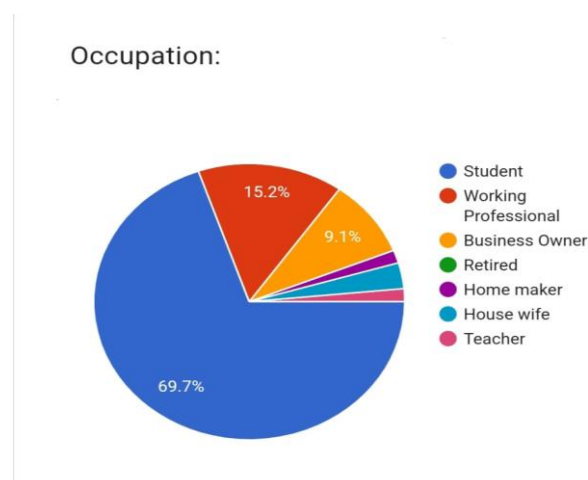
Interpretation: The findings reveal that a large portion of respondents (66.7%) are aged between 21 and 30, followed by those under 20 (21.2%), and a smaller group in the 31–40 range (9.1%). This suggests that the feedback is largely coming from younger individuals—mainly students and young professionals—who are typically more tech-savvy and open to change, although they may face financial constraints.

2. GENDER



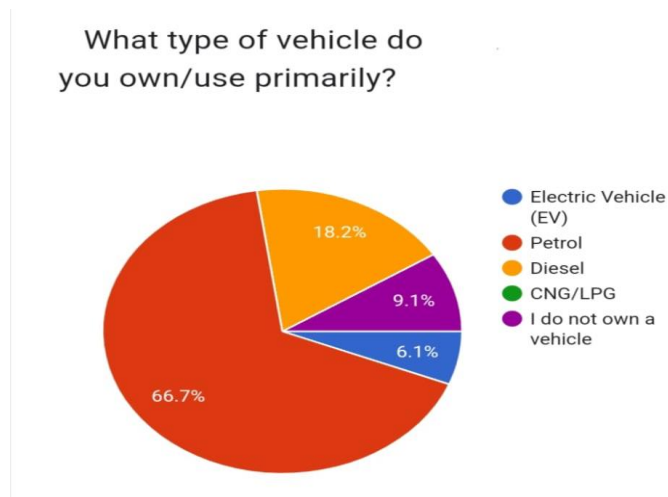
Interpretation: There is a nearly equal representation of genders, with 53% male and 47% female respondents. This balance adds value to the data, ensuring that the views reflect both perspectives and allowing for more inclusive insights, especially in terms of preferences and behavior related to vehicle use and electric mobility.

3. OCCUPATION



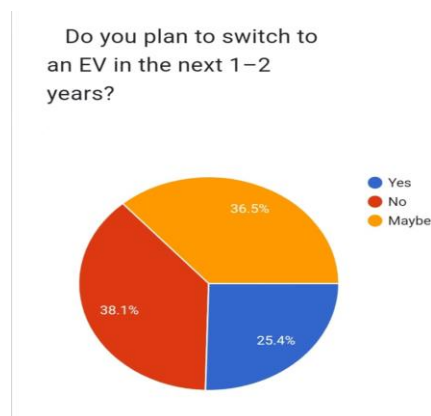
Interpretation: Students made up the largest portion of participants at 69.7%, with working professionals accounting for 15.2%. Other categories such as business owners, homemakers, teachers, and retirees were represented in smaller numbers. This heavy student participation reflects a population likely interested in future-oriented topics like EVs but potentially constrained by income or access.

4. TYPES OF VEHICLES USED



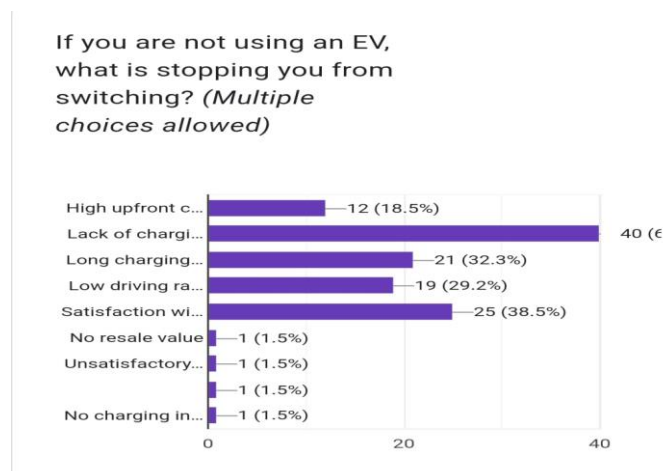
Interpretation: The majority of respondents (66.7%) primarily use petrol vehicles, while only 9.1% currently own an electric vehicle. Diesel (6.1%) and CNG/LPG (0%) users formed a minor segment, and 18.2% indicated they don't own a vehicle. These findings underline the dominance of petrol-based mobility and point to the nascent stage of EV adoption within the sample group.

5. EV ADOPTION PLANS



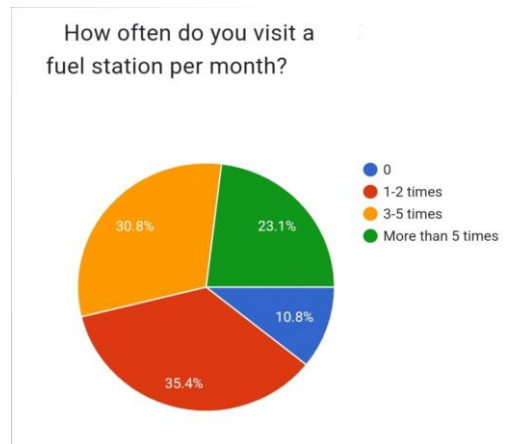
Interpretation: When asked about plans to switch to an EV within the next 1–2 years, 25.4% responded “Yes,” while 38.1% said “No,” and another 36.5% were uncertain. This indicates a considerable openness to transition, but also reveals hesitancy and a need for better information or incentives to encourage adoption.

6. BARRIERS TO EV ADOPTION



Interpretation: The most cited reason for not switching to an EV was a lack of charging stations (61.5%), followed by long charging times (32.3%) and low driving range (29.2%). High upfront costs were a concern for 18.5% of respondents. Other reasons like dissatisfaction with performance and resale value were cited less frequently. This data illustrates that infrastructural and technological limitations remain significant deterrents for potential EV users.

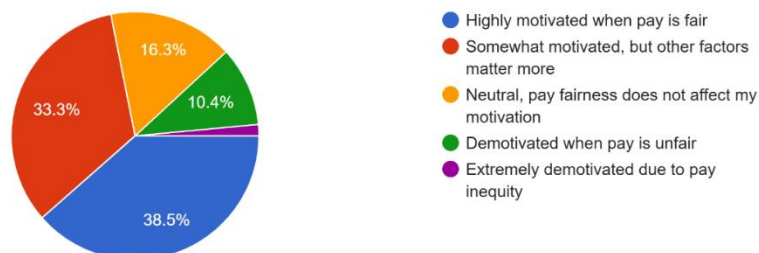
7. FUELING FREQUENCY



Interpretation: Among the respondents, 35.4% visit a fuel station 1–2 times per month, followed by 30.8% who go 3–5 times and 23.1% who visit more than 5 times. Only 10.8% reported not visiting at all, likely EV users or non-vehicle owners. This highlights moderate engagement with fuel stations, suggesting a significant number of vehicle users still rely regularly on traditional fuel sources.

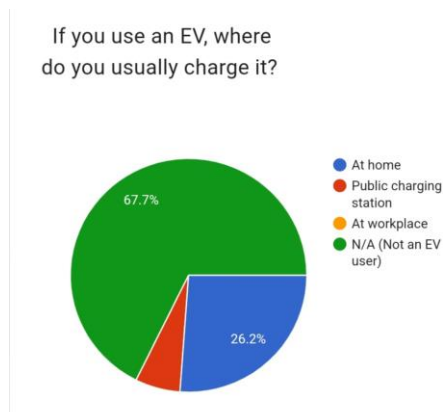
8. MONTHLY FUEL/CHARGING EXPENSE

How does your perception of pay equity impact your motivation at work?
135 responses



Interpretation: Spending patterns show that 42.4% of participants spend ₹1000–₹3000 per month on fuel or charging, while 28.8% spend less than ₹1000. Another 15.2% spend ₹3000–₹5000, with fewer respondents reporting higher expenses. This indicates a moderate cost burden for most users, reflecting mid-range travel needs and vehicle types.

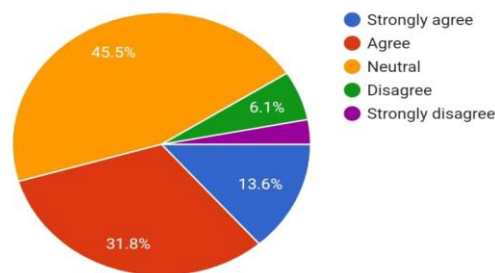
9. EV CHARGING LOCATION



Interpretation: The analysis shows that 67.7% of EV users prefer home charging, while charging stations are used by 26.2%, and office charging accounts for 6.1%. This indicates that the convenience of home charging is a major factor in EV usage, highlighting the importance of private charging infrastructure.

10. PERCEPTION OF FINANCIAL EFFICIENCY

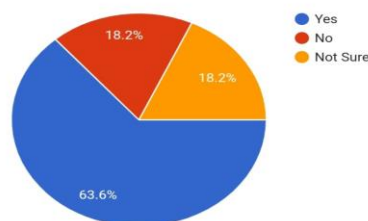
Do you believe EVs are financially more efficient than fuel-based vehicles?



Interpretation: The analysis shows that 41.7% of respondents believe EVs are more financially efficient, while 27.1% are unsure, and 21.9% disagree. This reflects a growing but cautious optimism around the financial benefits of EVs, with a significant portion still needing more convincing or awareness.

11. SALARY IMPACT ON FUEL STATION ON EV ADOPTION

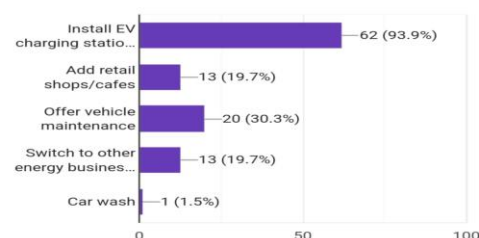
Do you think EV adoption will reduce the number of people visiting petrol pumps in the future?



Interpretation: The analysis shows that 63.6% of respondents believe EV adoption will reduce visits to petrol pumps, while 18.2% are unsure and 18.2% disagree. This suggests a strong perception that fuel stations will face declining footfall as EV use rises.

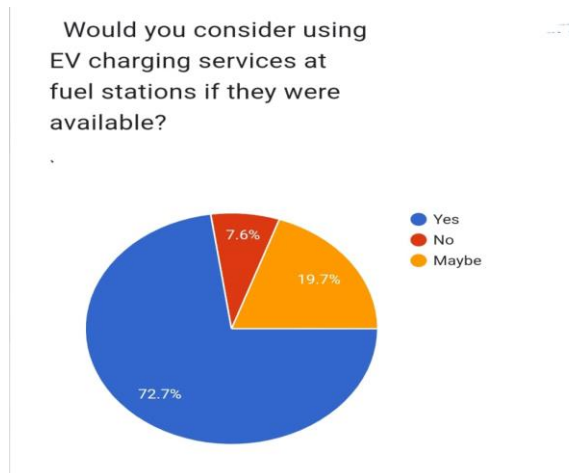
12. SUGGESTION FOR FUEL STATION SURVIVAL IN EV ERA

What do you think fuel stations should do to survive in the EV era?
(Multiple choices allowed)



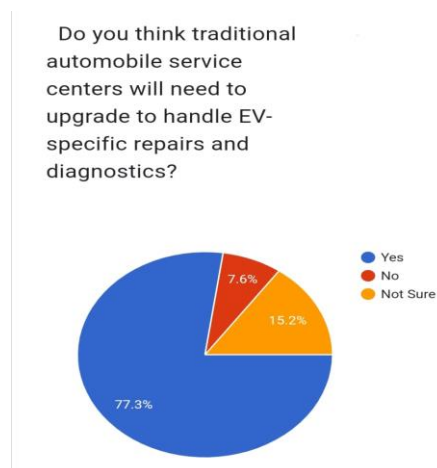
Interpretation: The analysis shows that the most favoured survival strategy is installing EV charging stations (93.9%), followed by diversifying services (30.3%) and partnering with clean energy brands (19.7%). This indicates a clear expectation from consumers that fuel stations must adapt to remain relevant in an EV-dominated future.

13. INTEREST IN USING EV SERVICES AT FUEL STATIONS



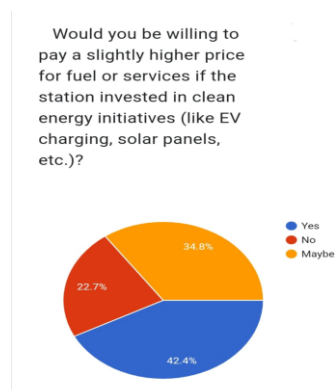
Interpretation: The analysis shows that 72.7% of respondents believe traditional service centre's must upgrade to handle EV-specific diagnostics and repairs, while 7.6% are unsure. This highlights a strong awareness of the technical shift required in the automobile service ecosystem.

14. UPGRADE OF AUTO SERVICE CENTERS



Interpretation: The analysis shows that 77.3% of respondents would consider using EV charging services at fuel stations, with only 7.6% saying no and 15.2% unsure. This indicates significant consumer openness to using hybrid service models, supporting the case for fuel stations investing in EV infrastructure.

15. WILLINGNESS TO PAY MORE FOR GREEN INVESTMENT



Interpretation: The analysis shows that 42.4% are willing to pay a slightly higher price for fuel if the station invests in clean energy, while 34.8% are unsure, and 22.7% are unwilling. This reflects a moderately positive attitude toward sustainability, with room to grow through education and awareness.

5.2 Analysis of the Data

The research identifies a clear consensus among consumers that the increasing uptake of electric vehicles (EVs) will have a significant effect on the financial performance of conventional fuel stations, mainly through a reduction in petrol and diesel sales. But the respondents also indicated that fuel stations that are willing to change by investing in EV charging infrastructure can access new sources of revenue and achieve long-term growth. This shift in consumer behavior, entailing that EV users drive to fuel stations less often, further accelerates the requirement for business model innovation. Financial preparedness issues of fuel stations to accommodate this change imply a necessity for government incentives and policy encouragement. Higher environmental consciousness and pro-EV government policies are also considered key drivers in expediting this trend. Although short-term pressures are anticipated, the participants acknowledge that fuel stations which expand their services and adopt a sustainability agenda could unlock great long-term opportunities, becoming key stakeholders in the mobility ecosystem of the future.

Overall Analysis Summary:

- **Impact of EV Adoption on Fuel Station Revenue:** EV adoption is seen to impact fuel stations' revenue negatively, indicating that fuel stations need to seek alternative revenue streams, such as EV charging infrastructure.
- **Change in Consumer Behavior:** Users of electric vehicles go to fuel stations much less frequently than users of conventional fuel vehicles. This change in consumer behavior also underlines the importance of fuel stations diversifying their offerings to include EV charging stations.
- **Financial Preparedness of Fuel Stations:** Consumers feel that fuel station owners are not financially prepared to shift towards electric vehicle infrastructure. Fuel stations might have to look for other sources of funding, such as government incentives or collaborations, to make this shift.
- These findings highlight the need for fuel stations to adapt to the increasing EV market and the economic obstacles fuel stations have in doing so. As these issues are resolved with innovation and investment, fuel stations can be sure to stay relevant in a rapidly electric world.

6.0 Conclusion

Overall, the use of electric vehicles (EVs) is sure to drastically change the fuel stations and automobile sectors. The transition to EVs can cut into fuel station profits from fewer customer visits in traditional vehicles. Fuel stations that make the investment in EV charging infrastructure, though, will be more likely to thrive. While consumers think fuel station owners will struggle financially to make the transition, it's obvious that embracing this shift is key to long-term success. The automobile sector has to change by elevating its concentration on the manufacturing of EVs so that it can be competitive in the changing market.

7.0 Recommendations

1. **Invest in EV Charging Infrastructure** – Gas stations have to put the installation of EV charging points on their agenda in order to remain competitive as demand for electric cars increases and capture new sources of revenue.
2. **Investigate External Financing and Collaboration** – Fuel station owners ought to pursue government incentives, grants, as well as possible collaboration with EV-related companies to ease the financial strain of making the shift to EV infrastructure.
3. **Diversify Services Beyond Fueling** – Fuel stations ought to invest in diversification of services like convenience stores, car washes, as well as furnishing maintenance facilities since these can mitigate the reduction in sales from fuel and bring in a larger customer base.
4. **Educate Consumers on EV Schemes and Advantages** – Fuel stations ought to actively inform consumers regarding government EV schemes, incentives, and advantages. Utilizing awareness campaigns, pamphlets, or digital screens can assist in promoting informed decisions and increasing EV uptake, particularly in low-awareness areas.
5. **Monitor and Adapt to Consumer Trends** – Fuel stations must continually analyze consumer patterns and remain informed about trends within the market concerning EV uptake, so they can adjust and orient their services to address the changing requirements of their customers.

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