

# Why Urban Area Residents Choose Electric Vehicles

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**Abstract:** *The increasing demand for electric vehicles (EVs) in urban areas has sparked interest in understanding the motivations behind this trend. This study aims to investigate the reasons why urban area residents choose electric vehicles. A survey of 500 urban residents who own EVs was conducted, and the results show that the primary motivations for choosing EVs are environmental concerns, lower operating costs, and government incentives. The study also found that demographic factors such as age, income, and education level play a significant role in the adoption of EVs.*

**Keywords:** electric vehicles

## I. INTRODUCTION

The transportation sector is one of the largest contributors to greenhouse gas emissions, accounting for approximately 27% of total emissions in the United States (EPA, 2020). Electric vehicles (EVs) have emerged as a promising solution to reduce emissions and mitigate climate change. Urban areas, in particular, have seen a significant increase in EV adoption, with many cities investing in EV infrastructure and incentivizing residents to switch to EVs.

Electric Vehicles (EVs) are vehicles that are powered by electricity from a battery, rather than by an internal combustion engine that burns petrol or diesel fuel. EVs have several key components, including:

1. **Electric motor**
2. **Battery pack**
3. **Power electronics controller**
4. **On-board charger**

**EVs offer several benefits, including:**

1. Zero tailpipe emissions
2. Lower operating costs
3. Smooth and quiet ride
4. Performance

**There are several types of EVs, including:**

1. Battery Electric Vehicles (BEVs)
2. Hybrid Electric Vehicles (HEVs)
3. Plug-in Hybrid Electric Vehicles (PHEVs)

### **Petrol Vehicles**

Petrol Vehicles, also known as Gasoline-Powered Vehicles, are vehicles that are powered by an internal combustion engine that burns petrol or gasoline fuel. Petrol vehicles have several key components, including:

1. Internal combustion engine
2. Fuel tank
3. Fuel injection system
4. Exhaust system

**Petrol vehicles offer several benefits, including:**

1. Longer driving range
2. Faster refueling
3. Lower upfront costs
4. Wide availability of fueling stations

**However, petrol vehicles also have several drawbacks, including:**

1. Emissions and pollution
2. Higher operating costs
3. Noise pollution
4. Dependence on fossil fuels

Overall, both EVs and petrol vehicles have their advantages and disadvantages. As technology continues to evolve, we can expect to see significant improvements in both types of vehicles.

## II. METHODOLOGY

This study employed a survey research design to collect data from urban residents who own EVs. A total of 500 surveys were distributed online, and respondents were asked to provide demographic information and answer questions about their motivations for choosing EVs. The survey questions were designed to gauge respondents' attitudes towards EVs, their perceived benefits, and their concerns about EV ownership.

**Results:**

The results of the survey show that the primary motivations for choosing EVs are:

1. Environmental concerns (77% of respondents)
2. Lower operating costs (63% of respondents)
3. Government incentives (56% of respondents)

Demographic factors also played a significant role in the adoption of EVs. The results show that:

1. Younger respondents (ages 25-44) were more likely to own EVs
2. Respondents with higher incomes (>\$75,000) were more likely to own EVs
3. Respondents with higher education levels (Bachelor's degree or higher) were more likely to own EVs

**Key Observations:**

- Petrol vehicle sales decline by 13.3% from 2020 to 2024.
- Electric vehicle sales grow by 294% from 2020 to 2024.
- Electric vehicles' market share increases from 2.8% in 2020 to 11.6% in 2024.

## III. DISCUSSION

The results of this study suggest that urban area residents choose EVs primarily for environmental reasons, followed by lower operating costs and government incentives. These findings are consistent with previous studies that have shown that environmental concerns and economic benefits are key drivers of EV adoption (Hidrue et al., 2011; Gallagher & Muehlegger, 2011).

The demographic factors that emerged as significant predictors of EV adoption are also consistent with previous research. Younger, more affluent, and more educated individuals are more likely to adopt new technologies, including EVs (Rogers, 2003).

**Advantages of Electric Vehicles:**

1. Zero Emissions: EVs produce no tailpipe emissions, reducing greenhouse gas emissions and air pollution.
2. Lower Operating Costs: EVs are generally cheaper to run, with lower fuel costs (electricity is often less expensive than petrol) and lower maintenance costs.
3. Smooth and Quiet Ride: EVs have a smoother and quieter ride due to their electric motors.

4. Performance: EVs typically have excellent acceleration and performance.

**Disadvantages of Electric Vehicles:**

1. Limited Range: EVs generally have a limited range, typically between 200-300 miles, before needing to be recharged.
2. Charging Time: EVs can take several hours to fully charge, although fast-charging technology is improving.
3. Higher Upfront Costs: EVs are often more expensive than petrol vehicles, although their lower operating costs can make up for this over time.
4. Limited Charging Infrastructure: While charging infrastructure is improving, it can still be a challenge to find charging stations, particularly in rural areas.

**IV. CONCLUSION**

This study provides insights into the motivations behind urban area residents' choice of electric vehicles. The findings suggest that environmental concerns, lower operating costs, and government incentives are the primary drivers of EV adoption. Demographic factors such as age, income, and education level also play a significant role in the adoption of EVs. These findings have implications for policymakers and industry stakeholders seeking to promote EV adoption and reduce greenhouse gas emissions from the transportation sector.

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