FACTORS INFLUENCING THE MARKET SHARE OF NEW ENERGY VEHICLS ON CHINA - A CASE STUDY OF BYD

JIANG YUN
6317195861

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION
GRADUATE SCHOOL OF BUSINESS
SIAM UNIVERSITY
2023

FACTORS INFLUENCING THE MARKET SHARE OF NEW ENERGY VEHICLS ON CHINA - A CASE STUDY OF BYD

JIANG YUN
6317195861

This Independent Study has been approved as a Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

Advisor: Jidapa C.
(Dr. Jidapa Chollathanrattanapong)

Date: 12 / July / 2024

(Associate Professor Dr. Jomphong Mongkhonvanit)
Dean, Graduate School of Business

Date 1 / Aug / 2024

Title: Factors Influencing the Market Share of New Energy Vehicles on China - A Case Study of BYD

By: Jiang Yun

Degree: Master of Business Administration

Major: International Business Management

Advisor: .....Jidapa C.....

(Dr. Jidapa Chollathanrattanapong)

.....12...../.....July...../.....2024...

ABSTRACT

The new energy vehicle market is transitioning from policy-driven to market-led. To expand the market share of new energy vehicles, it is crucial to fully consider the factors influencing their market share. Only by doing so can the market transformation and sustainable development of the new energy vehicle industry be achieved.

To explore how to increase China's new energy vehicle market share, this study takes BYD as a case and conducts an in-depth analysis of the key factors influencing market share. The study aims to 1) To verify whether environmental awareness has a positive impact on the market share of new energy vehicles; 2) To verify whether government policies have a positive impact on the market share of new energy vehicles and 3) To verify whether technical characteristics have a positive impact on the market share of new energy vehicles.

This study is based on Rational Action Theory and employs quantitative analysis methods, using statistical software SPSS for data processing and analysis. By distributing online questionnaires, 200 valid responses were successfully collected to assess the factors influencing the market share of new energy vehicles. The findings indicate that: 1) Environmental awareness has a positive impact on the market share of new energy vehicles; 2) Government policies have a positive impact on the market share of new energy vehicles and 3) Technical characteristics have a positive impact on the market share of new energy vehicles.

The research conclusions can help companies enhance the rationality of their marketing strategies for new energy vehicles, facilitating faster and more effective market entry and development. Additionally, these insights can guide companies in optimizing product design, improving technology, adjusting pricing strategies, and formulating more attractive marketing plans. This, in turn, will help companies secure a more advantageous position in the competitive market and achieve steady growth in market share.

Keywords: New Energy Vehicle, Market Share, BYD, Environmental Awareness, Government Policies, Technical Characteristics

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my advisor, for her invaluable guidance,support, and encouragement throughout my independent study. Her insightful comments and constructive criticism have significantly improved the quality of my work.

Additionally, I am grateful to Associate Professor Dr. Jomphong Mongkhonvanit, Dean,Graduate College of Business, for his support and encouragement throughout my studies. His dedication to the graduate program and commitment to excellence have inspired me to strive for academic excellence.

Finally, I would like to extend my appreciation to all the faculty members and staff of the Siam University who have contributed to my growth and development as a student. Their unwavering support and encouragement have been a source of inspiration and motivation tome.

Declaration

I, Jiang Yun, at this moment certify that the work embodied in this independent study entitled "Factors Influencing the Market Share of New Energy Vehicles on China —A Case Study of BYD" is a result of original research and has not been submitted for a higher degree to any other university or institution.

Jiang Yun

(Jiang Yun)
June 26, 2024

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1 Introduction

1.1 Background of the Study

Climate change and air pollution are serious global challenges, prompting countries worldwide to change their energy consumption patterns and strive to build a clean, safe, and stable energy supply system. As the number of automobiles increases and their usage expands, the negative environmental impacts grow significantly. New energy vehicles (NEVs), employing innovative technological solutions, effectively reduce harmful gas emissions caused by fossil fuels (Chen et al., 2015). Therefore, NEVs have become the future direction of the automotive industry.

As the world's largest emitter of carbon dioxide, China officially announced its energy conservation and emission reduction plan in 2015, committing to peaking carbon emissions by 2030 or earlier. New energy vehicles (NEVs) are regarded as an effective strategy to address air pollution, mitigate climate change, and achieve carbon neutrality (Rao et al., 2022). Simultaneously, the high-quality development of the NEV industry is crucial for enhancing the international competitiveness of the automotive industry and achieving efficient coordination among urban transportation, energy, and environment (Prateek et al., 2016). The global NEV market is rapidly expanding, with China being a major market and leading manufacturer of NEVs worldwide.

The widespread application of new energy vehicles (NEVs) is a strategic initiative in a new stage of development aimed at promoting high-quality economic growth in China. It serves as a crucial driver and engine for deepening the integration of China's digital economy with the traditional economy. Therefore, the Chinese government has introduced a series of incentive policies to promote the development of the NEV industry. For instance, the "Made in China 2025" strategy launched in 2018 continues to support the development of electric and fuel vehicles, clearly positioning NEVs and energy-saving vehicles as the future direction of the automotive industry. The "13th Five-Year Plan" further emphasizes the promotion of industrial upgrading and support for the development of emerging industries, providing robust policy support for accelerating the adjustment and transformation of the automotive industry.

The market for new energy vehicles (NEVs) is gradually shifting towards market-led development. However, compared to traditional vehicles, NEVs still hold a relatively low market share, and consumer enthusiasm for purchasing NEVs remains subdued (Li et al., 2022). Therefore, to increase the market share of NEVs, it is essential to start from the perspective of consumers and fully consider the factors influencing NEV market share. Only by doing so can the market transformation and sustainable development of the NEV industry be achieved.

1.2 Questions of the Study

In the context of the global promotion of environmental protection and sustainable energy transformation, the market development of new energy vehicles (NEVs) is of great significance for reducing carbon emissions and promoting green transportation (Zhang & Qian, 2022). As one of the world's largest automobile markets, China's promotion and application of new energy vehicles have received strong support from government policies and have gradually become a new choice for consumers (Wang, 2021). In particular, BYD, as the leading domestic new energy vehicle manufacturer, has achieved remarkable results in technological innovation and market expansion. Understanding the impact of environmental awareness, analyzing the influence of government policies on the market, and studying the effects of new energy vehicle technological features on consumer choices are crucial topics in current research on the new energy vehicle market.Therefore, this study poses the following research questions:

1) Does environmental awareness have positive impact on the market share of new energy vehicles?

2) Do government policies have positive impact on the market share of new energy vehicles?

3) Do technical characteristics have positive impact on the market share of new energy vehicles?

1.3 Objectives of the Study

Based on the above background, this study aims to explore the key factors affecting the market share of new energy vehicles in China, and explore the mechanism of factors such as environmental awareness, government policies, and technical characteristics on the market competitiveness of new energy vehicles from multiple perspectives. Through in-depth analysis of the interrelationship between these factors, this study provided effective market strategy suggestions for BYD and other companies and promote the healthy development of China's new energy vehicle industry. This study has the following research objectives:

1) To verify whether environmental awareness has a positive impact on the market share of new energy vehicles.

2) To verify whether government policies have a positive impact on the market share of new energy vehicles.

3) To verify whether technical characteristics have a positive impact on the market share of new energy vehicles.

.

1.4 Scope of the Study

This study aims to explore the key factors influencing the market share of new energy vehicles (NEVs) in China, with a special focus on industry leader BYD (Build Your Dreams). Based on Rational Action theory, the research reviews literature on the multidimensional factors affecting NEV market share. The study covers critical factors such as environmental awareness, government policies, and technological characteristics, aiming to provide in-depth analysis and understanding of market strategies and consumer behavior in the NEV market.

The findings will offer insights and inspiration for manufacturers, especially BYD, and policy makers to enhance the market acceptance and sales growth of NEVs. Moreover, the research will provide valuable strategic insights for the sustainable development and innovation of the industry, facilitating the greater role of NEVs in future market development and global competition.

1.5 Significance of the Study

1) Theoretical Significance

From a theoretical perspective, conducting a comprehensive analysis of the key drivers influencing China's new energy vehicle market share holds profound academic significance. By thoroughly examining these drivers, it can provide theoretical foundations for formulating more effective policies and strategies.

Furthermore, it facilitates the integration of theory and practice within the automotive industry, while also promoting academic exchange and collaboration across different disciplines such as marketing and environmental science. This approach can offer new theoretical perspectives and profound insights into the developmental trajectory and market competition strategies of the new energy vehicle market.

2) Practical Significance

This study on the market share of China's new energy vehicles, focusing particularly on BYD (Build Your Dreams), provides insights into increasing market share through consumer willingness, government policies, and technological characteristics. By identifying the key factors influencing the market share of new energy vehicles, this research can assist new energy vehicle companies, especially BYD, in promptly identifying and resolving market and technological issues, enhancing service quality and product competitiveness, and strengthening brand visibility and appeal. Furthermore, the findings of this study provide policymakers with a basis for formulating more effective incentive measures and policies to support the development of new energy vehicles, contributing to the expansion of market share in the new energy

vehicle industry and supporting regional economic development and environmental protection. Additionally, the developmental experience of China's new energy vehicle industry offers valuable insights and inspiration for the global market, crucial for promoting the healthy growth and environmental sustainability of the global new energy vehicle industry.

Chapter 2 Literature Review

2.1 Introduction

This study focuses on the key drivers of growth in China’s new energy vehicle market and their impact on market share, with particular attention to BYD’s role as the industry leader. In recent years, the rise in environmental awareness, government policy support, and technological advancements have become crucial factors driving market growth. Therefore, based on rational theory, an in-depth examination of how these factors influence market share is essential for understanding the development of China ’s new energy vehicle market.

2.2 Literature Reviews

In the context of today's economic globalization, new energy vehicle manufacturers are facing not only the huge challenge of product development, but also the severe pressure of new energy vehicle marketing. In 2016, China began to implement the new energy vehicle promotion and application project, and the government further increased its support for new energy vehicles (Ding et al., 2022). The market for new energy vehicles has shown rapid growth, and its market share has gradually increased (Hu & Xia, 2023). Due to the high cost and durability of new energy vehicles, consumers do not make purchasing decisions based solely on personal preferences. They require extensive product information related to environmental awareness, government policies, and technological innovation to support their decisions (Zhang, 2022; Le et al., 2022).

2.2.1 Theory of Rational Action

The Theory of Reasoned Action (TRA), proposed by American scholars Fishbein and Ajzen in 1975, provides a novel analytical perspective for cross-sector data sharing. This theory is primarily used to analyze how attitudes consciously influence individual behavior, elucidating the causal relationships between behavioral attitudes, subjective norms, and behavioral intentions. The TRA model predicts individual behavior directly through behavioral intentions, which are influenced by two main factors: behavioral attitudes and subjective norms (Long, 2014).

Attitude refers to an individual’s or organization’s favorable or unfavorable feelings towards a particular behavior, encompassing both positive and negative attitudes (Lu & Li, 2019). This is determined by the individual’s or organization’s perceptions of the expected outcomes of the behavior and their evaluation of these outcomes. Subjective norms refer to the social pressure an individual or organization feels when evaluating whether to perform a certain behavior (Qiu, 2005). Generally, individuals who exhibit a more positive attitude towards a behavior and experience stronger subjective norms are more likely to have the intention to perform that behavior.

The Theory of Reasoned Action posits that people's behavior is influenced by rational thinking and calculation, rather than by emotions, biases, or other irrational factors (Duan et al., 2020). The theory primarily includes the following three assumptions: people's behavior is based on the pursuit of goals and interests, and they will choose the behavior that best aligns with their goals and interests among different options; people evaluate various available behavioral options based on their beliefs and values to determine the optimal choice; and people engage in rational thinking and calculation when making decisions to select the best course of action (Fishbein, 1977).

The Theory of Reasoned Action has a broad range of applications, including fields such as marketing, finance, and healthcare. In marketing, the theory can be used to study the consumer decision-making process, helping businesses design better marketing strategies. In finance, it can be applied to study investor decision-making processes and market behavior, aiding investors in making more rational investment decisions.

In summary, the Theory of Reasoned Action asserts that people's behavior results from rational decision-making, a process based on goals and interests. This theory helps in understanding and predicting human behavior.

2.2.2 Environmental Awareness

Environmental awareness can be defined as an individual's ability to understand and evaluate issues related to human consumption activities and behaviors that can have either positive or negative impacts on the environment. Generally, environmental awareness positively influences consumers' attitudes toward eco-friendly products, thereby leading to changes in their own behaviors (Nguyen et al., 2019).

Generally, the higher consumers' awareness and concern for environmental protection, the more likely they are to develop a green purchase intention (Netemeyer et al., 2005). This means that when buying goods or services, consumers tend to choose products that are environmentally friendly or have sustainable features. It reflects consumers' environmental awareness, attitudes, and behavioral intentions, serving as a crucial foundation for their purchasing decisions. It also demonstrates the increasing concern for environmental issues among consumers, as well as a sense of social responsibility and awareness of sustainable development (Li Ping et al., 2018). In this context, governments and organizations worldwide have started to implement relevant policies and standards to encourage and guide companies to produce and sell more environmentally friendly products and services. This helps meet the growing consumer demand for eco-friendly options and assists companies in increasing their market share.

Consumers with stronger environmental awareness and greater knowledge of household energy-saving practices are more likely to achieve energy conservation and environmental protection goals by changing their own behavior. However, when consumers are uninformed, possess incorrect environmental knowledge, or are entirely unaware of green ecological information, they find it challenging to engage in

environmentally friendly behaviors (Chen & Chang , 2013). For example, consumers often underestimate their own energy consumption and associate global warming issues with industries rather than personal behavior, reducing their acceptance of new energy vehicles (Wang et al., 2020). Additionally, some studies suggest that prior knowledge of new energy vehicles can negatively impact consumers' willingness to repurchase them.

Companies that effectively educate consumers and correct misconceptions about environmental impact and energy consumption will gain a competitive advantage, increasing their market share. By enhancing consumers' environmental awareness and knowledge, companies can boost the acceptance and adoption of eco-friendly products, such as new energy vehicles, thereby capturing a larger market share (Li & Deng, 2019). Conversely, failing to address these informational gaps may hinder market penetration and growth in the eco-friendly product segment.

In summary, enhancing environmental awareness is crucial for promoting consumers' green purchasing behavior and increasing market share. Strengthening consumers' environmental awareness is not only key to achieving sustainable development but also an important strategy for businesses to achieve commercial success.

2.2.3 Government Policies

Government policies on new energy vehicles refer to legislative, policy, and fiscal measures aimed at promoting and supporting the development, production, sale, and use of new energy vehicles. Government helps enhance companies' technological capabilities and competitiveness through relevant policies, aiding them in seizing market opportunities, increasing sales, and accelerating the development of the new energy vehicle industry (Xiong & Qin, 2023).

Various governments worldwide have implemented economic subsidies and incentive programs to stimulate the consumption of new energy vehicles and expand market share. Governments in Japan and Germany have already introduced policies of free charging for new energy vehicle users (Huang, 2019). Norway has pioneered its new energy vehicle industry with subsidies for the construction of both public and private charging infrastructure (Rezvani et al., 2019). In the United States, the government has initiated financial subsidy programs for new energy vehicle users and offers statewide income tax credits (Hoen & Koetse, 2014).

Lucas et al. (2019) identified the driving factors of the new energy vehicle market by analyzing data from 200 major metropolitan areas in the United States in 2016. The results indicate that the most significant factors include financial incentives, charging infrastructure, and the availability of new energy vehicle models. Helveston et al. (2015) found that economic incentives play a crucial role in the adoption of new energy vehicles

in the United States. Their study, based on state-level data, revealed that rebates, HOV lane access, emissions test exemptions, and annual fees are all significantly positively correlated with the market share of pure new energy vehicle sales.

Vergis and Chen's research found that, in addition to consumer, geographic, and energy market attributes, the availability of charging infrastructure affects the adoption of new energy vehicles (2017). Regarding charging infrastructure, the authors observed a significant correlation between new energy vehicle sales and the availability of charging infrastructure, although they noted that this effect appears to be smaller than that of financial incentives. Wee et al. (2020) found that for every $1000 increase in model-specific incentives, sales increased by 5-11%. Li et al. (2019) studied the effects of sales incentives and subsidies for charging infrastructure development, revealing that sales incentive measures have a substantial impact on new energy vehicle sales, but the effect is even greater when subsidies are directly allocated to charging infrastructure.

In summary, government policies play a crucial role in advancing the development of the new energy vehicle market. By providing economic incentives and subsidies such as tax benefits and sales rewards, governments can significantly boost the sales of new energy vehicles and expand market share. Simultaneously, subsidies for the construction and development of charging infrastructure also play a vital role in market expansion. These policies not only stimulate consumer adoption but also support the long-term sustainable development of the new energy vehicle industry.

2.2.4 Technical Characteristics

When users are more inclined to embrace emerging technologies, their intention strengthens to reshape their behavioral patterns and invest more effort and time in adopting cutting-edge technologies.

The technical characteristics are critical attributes influencing the market share of new energy vehicles. In the context of new energy vehicle products, consumers have limited understanding of the performance of new energy vehicles because they are relatively new compared to traditional fuel-powered vehicles. Specifically, the powertrain of new energy vehicles relies on batteries, which differs significantly from the fuel-driven systems of traditional combustion engine vehicles. Despite the advantages such as low operating costs, convenience of use, and ease of maintenance, issues with range anxiety and battery technology continue to trouble both new energy vehicle users and manufacturers. Once consumers become aware of the high risks associated with the performance aspects of new products, it is likely to deter them from adopting new energy vehicles.

According to Gautam and Bolia (2023), the driving range of electric vehicles is still a key consideration for consumers, which is of great significance for reducing emissions and promoting sustainable urban development. In addition, Yi et al. (2024) discussed

the trade-offs between fuel vehicles and new energy vehicles, fuel consumption reduction, and the impact of digital technology in automobile industry decision-making.

The limited driving range is a well-known technological constraint of new energy vehicles, which can be overcome through consumer awareness of charging convenience. However, factors such as insufficient charging infrastructure, vehicle safety concerns, and "range anxiety" continue to hinder widespread adoption of new energy vehicles. Consumers are primarily concerned about driving range and charging time (Gao et al., 2023), with the limited driving distance causing consumer apprehension.

In summary, technological features are crucial factors influencing consumer market share for new energy vehicles. To promote widespread acceptance and application of new energy vehicles, it is essential to address technological constraints and enhance consumer awareness and acceptance of new technologies.

2.3 Company Introduction

BYD, as a leader in China's new energy vehicle industry, has been committed to technological innovation and market expansion since its establishment to promote the global transition to sustainable energy and environmental protection. As the world attaches increasing importance to sustainable energy transformation and environmental protection, the development of new energy vehicles (NEVs) has become a key way to solve the environmental pollution problem of traditional energy vehicles. During this transformation, BYD, with its remarkable success in technological innovation and market strategy implementation, not only occupied an important position in the Chinese market, but also gradually became an important player in the global market.

BYD's success is not only due to its strong technical strength and innovation capabilities, but also its keen insight into market trends and in-depth understanding of consumer needs. The company is committed to meeting the needs of different market segments by providing diversified products and comprehensive services, thereby occupying a leading position in the fierce market competition. As the global new energy vehicle market continues to develop, BYD will continue to promote its leadership in technological innovation and market expansion, and make greater contributions to the green transformation and sustainable development of the global automotive industry.

2.4 Conceptual Framework

This study takes environmental awareness, government policies and technical characteristics as core variables and constructs a conceptual framework to explore how these factors work together to increase the share of the new energy vehicle market. These three elements have been fully reflected in BYD's market strategy and technological innovation, allowing it to gradually gain advantages in the fierce market competition.

Therefore, this article focuses on the relationship between these three core variables and their impact on market share. The main content focuses on how to comprehensively enhance the market competitiveness of new energy vehicles through these factors to achieve sustained growth in market share. The conceptual framework is shown in Figure 2.1:

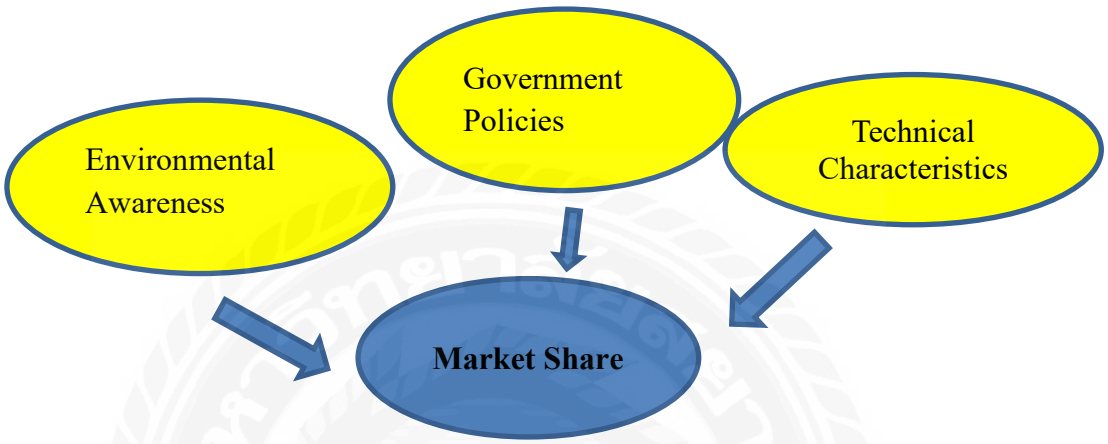

Figure 2.1 Conceptual Framework

Chapter 3 Research Methodology

3.1 Introduction

This study mainly uses questionnaire survey and data statistical analysis methods to explore the factors influencing the market share of new energy vehicles, proposes a research design, and designs a structured questionnaire. Based on this, relevant research hypotheses are put forward, and the questionnaire scale The reliability were systematically analyzed to ensure the accuracy of data analysis.

3.2 Research Design

The questionnaire employs a commonly used measurement tool, the five-point Likert scale, which divides the evaluation into five levels, ranging from strongly disagree to strongly agree. This approach enables a more accurate understanding of respondents' perceptions and attitudes towards the factors influencing the market share of new energy vehicles.

3.2.1 Environmental Awareness Scale

Consumers' environmental awareness is closely associated with the market share of new energy vehicles. Consumers with higher environmental awareness are more likely to choose new energy vehicles. Studies indicate that consumers' sense of environmental responsibility is gradually increasing, with a growing emphasis on environmental protection when considering purchasing vehicles, and they are willing to pay extra to reduce environmental pollution (He et al., 2018), thereby increasing the market share of new energy vehicles. Additionally, an increasing number of consumers have a growing understanding and awareness of new energy vehicles, believing that choosing new energy vehicles can improve their quality of life while simultaneously reducing their environmental impact (Lashari et al., 2021). Therefore, this study designed an environmental awareness scale, as shown in Table 3.1.

Table 3.1 Environmental Awareness Scale

Primary Index	Problem Statement
Environmental Awareness	I think buying new energy vehicles is an effective way to reduce environmental pollution.
	I am willing to pay extra to buy new energy vehicles for the sake of environmental protection.
	Environmental protection is one of the main considerations when you purchase a new energy vehicle.

	I believe that new energy vehicles can improve my quality of life while reducing the impact on the environment.
	Environmental performance is an important factor that I consider when choosing a car.

3.2.2 Government Policies Scale

Government policies have a significant impact on the market share of new energy vehicles, with the intensity of policy support being a crucial indicator affecting market share (Hu et al., 2022). Among all policies related to new energy vehicles, economic incentives have the most significant effect. Measures such as reducing purchase and value-added taxes are the most powerful incentives for encouraging the adoption of new energy vehicles by lowering upfront costs (Yang et al., 2023). Additionally, the government provides charging infrastructure for owners of new energy vehicles to increase their usage rates and market share (Li et al., 2021). Therefore, this study designed a government policies scale, as shown in Table 3.2:

Table 3.2 Government Policies Scale

Primary Index	Secondary Index	Problem Statement
Government Policies	Economic Incentives	The government-provided vehicle purchase subsidy makes me more inclined to buy new energy vehicles.
		The policy of exempting from purchase tax has increased my willingness to buy new energy vehicles.
		The price of electric vehicles is the primary factor for me when making a purchase.
		Government support for new energy vehicles makes me more optimistic about their market prospects.
	Construction of Charging Infrastructure	The construction of more charging infrastructure would encourage more people to switch to electric vehicles.
		The availability of charging infrastructure is very important in my decision to purchase an electric vehicle.
		The coverage of charging infrastructure is very important in your decision to purchase an electric vehicle.

3.2.3 Technical Characteristics Scale

Consumers' primary focus on new energy vehicles still largely centers around their technical characteristics. Advanced technologies will lead to higher success rates for new energy vehicles. Wallis et al. pointed out that consumer unfamiliarity with new energy vehicles, such as range anxiety, uncertainty about battery life, and other factors associated with new vehicles, may inhibit consumer acceptance of new energy vehicles, thereby affecting their market share. Providing more information about safety, driving range, charging time, battery life, environmental performance, etc., will make consumers more familiar with new energy vehicles and more willing to adopt them. Therefore, this study designed a Technical Characteristics scale, as shown in Table 3.3:

Table 3.3 Technical Characteristics Scale

Primary Index	Secondary Index	Problem Statement
Technical Characteristics	Battery Technology	I consider rapid charging capability as an essential feature that new energy vehicles should possess.
		You have hesitated to purchase a new energy vehicle due to concerns about battery technology.
		If the battery of a new energy vehicle suddenly runs out while driving, it will cause a lot of inconvenience.
	Range Anxiety	The driving range of new energy vehicles meeting my daily needs is a crucial factor for my purchase.
		I believe that new energy vehicles meet my long-distance travel needs.

3.3 Hypothesis

H_a: Environmental awareness has a positive impact on the market share of new energy vehicles.

H_b: Government policies have a positive impact on the market share of new energy vehicles.

H_c: Technical characteristics have a positive impact on the market share of new energy vehicles.

3.4 Population and Sample Size

This study selects consumers in the Chinese market who already own BYD new energy vehicles as samples, focusing primarily on their environmental awareness, government policies, and perceptions of the technical performance of BYD new energy

vehicles. Consumers play a pivotal role in the development of BYD new energy vehicle market, and their purchasing behavior directly impacts the brand's market share. Therefore, the distribution of 200 questionnaires in this survey will contribute to a deeper understanding of the current market situation and potential challenges, providing valuable insights and guidance for the future development of BYD new energy vehicles.

3.5 Data Collection

A total of 200 questionnaires were distributed in this survey, and all 200 valid questionnaires were successfully retrieved, resulting in a 100% response rate. Through quantitative analysis of the collected data, we can gain deeper insights into consumer preferences. These analytical findings can also serve as scientific evidence for policymakers and business decision-makers, enabling them to better understand market trends and changes in consumer demand. Consequently, more effective marketing strategies and product planning can be formulated.

3.6 Data Analysis

To accurately assess the factors influencing the market share of new energy vehicles, the collected data was statistically analyzed using SPSS software. SPSS is a widely used statistical software capable of performing various complex data processing and analysis tasks. Through SPSS analysis, this study aims to deeply understand and identify the key factors driving the market share of new energy vehicles. During the analysis process, descriptive statistical analysis was first performed on the samples to understand the distribution of basic data. Then, reliability analysis was conducted to verify the consistency of the questionnaire. Finally, correlation and regression analyses were carried out to determine the impact of each factor on the market share of new energy vehicles.

3.6.1 Reliability Analysis of the Questionnaire

Reliability analysis is used to measure the consistency, stability and reliability of the questionnaire. The most commonly used reliability index is Cronbach's α. Generally speaking, the value of α coefficient is between 0 and 1, and the higher the value, the higher the reliability. The specific analysis results are shown in Table 3.4:

Table 3.4 Reliability Analysis of Overall Questionnaire

Variables	N	Cronbach's Alpha
Environmental Awareness	5	0.835
Government policies	7	0.813
Technical characteristics	5	0.776

Based on Table 3.4,Environmental awareness is measured by 5 items with a Cronbach's Alpha of 0.835, indicating a high level of consistency among the items for this variable Government policies measured by 7 items and has a Cronbach's Alpha of 0.813, suggesting a very high level of agreement among the items that comprise this scale, and implying that the questions are well-aligned in capturing respondents' acceptance of government policies. Technical characteristics is represented by 5 items with a Cronbach's Alpha of 0.776, which, while slightly lower than the other variables, still denotes a strong reliability and suggests that the items are cohesive.

3.6.2 Validity Analysis of the Questionnaire

Table 3.5 Questionnaire Validity Analysis Results

The KMO Values and the Bartlett's Sphericity Test		
Number of KMO Sampling Suitability Quantities		0.793
The Sphericity Test of the Bartlett	Approximate chi-square	2013.432
	df	168
	Sig.	0.000

This study assessed the validity of the questionnaire using KMO measurement and Bartlett's test of sphericity. The KMO measurement evaluates the correlation between variables, with a KMO value exceeding 0.6 indicating a certain degree of correlation among the variables in the questionnaire. Bartlett's test of sphericity assesses the adequacy of the sample data. According to the data analysis results from Table 3.5, the KMO value was found to be 0.793, indicating the rationality of the questionnaire's structure. Additionally, the significance level of Bartlett's test of sphericity was less than 0.001, further confirming the questionnaire's validity. Therefore, the questionnaire used in this study demonstrates a high level of scientific rigor and reliability in design and content, effectively reflecting the respondents' real situations.

Chapter 4 Findings

4.1 Introduction

This chapter mainly explores the key factors driving the growth of China's new energy vehicle market. Through the utilization of descriptive analysis, correlation analysis, and regression analysis methods, it delves into the impact of consumer environmental awareness, government policies, and technological performance on the market share of new energy vehicles. These analytical findings help reveal trends in the new energy vehicle market and serve as crucial reference points for formulating pertinent policies and market strategies.

4.2 Descriptive Statistical Analysis

The basic information of the sample mainly includes gender, age, Education Level. Table 4.1 below shows the following:

Table 4.1 Sample Basic Information Table (N= 200)

Survey Items	Category	Number of people	Percentage (%)
Gender	Male	143	71.5
	Female	57	28.5
Age	18-24	98	49
	25-34	81	40.5
	Over 35 years old	21	10.5
Education Level	High school/Technical secondary school	19	9.5
	Junior college	7	3.5
	Bachelor's degree	102	51
	Master's degree or above	72	16

The table provides information on the distribution of employees by gender, age, educational and do you own a New Energy Vehicle.

In terms of gender distribution, 143 men participated in the survey, accounting for 71.5%, while 57 women participated, accounting for 28.5%.

In terms of age distribution, there are 98 people aged 18-24, accounting for 49%, 81 people aged 25-34, accounting for 40.5%, and 21 people over 35 years old, accounting for 10.5%.

In terms of education level distribution, there are 19 people with a high school/technical school degree, accounting for 9.5%, 7 people with a college degree, accounting for 3.5%, and 102 people with a bachelor's degree, accounting for 51% , and 72 people have a master's degree or above, accounting for 16%.

4.3 The Impact of Environmental Awareness on the Market Share of New Energy Vehicles

Table 4.2 Correlation Analysis of the Environmental Awareness on the Market Share of New Energy Vehicle

Dimension	Environmental Awareness	Market Share
Environmental Awareness	1	
Market Share	0.723**	1

According to the correlation analysis (Table 4.2), there is a significant positive relationship between environmental awareness and market share ($r=0.723$, $p<0.01$). This result indicates that higher levels of environmental awareness are associated with a greater market share of new energy vehicles. This significant positive correlation means that as people's environmental awareness increases, they are more inclined to support and purchase environmentally friendly cars, thereby boosting the market share of new energy vehicles.

Table 4.3 Regression Analysis of the Environmental Awareness on the Market Share of New Energy Vehicle

	Non-standardized coefficient		Standardized coefficient	t	p	R^2	Adjusting R^2	F
	B	Standard Error	Beta					
(Constant)	0.721	0.073	-	5.751	0.000			
Environmental Awareness	0.781	0.068	0.872	13.413	0.000	0.695	0.621	171.65

The regression analysis (Table 4.3) of environmental awareness on the market share of new energy vehicles shows that the R^2 value of the regression model is 0.695.

This indicates that the environmental awareness variable can explain approximately 69.5% of the variation in the market share of new energy vehicles. This suggests that environmental awareness is an important factor influencing the market share of new energy vehicles. Additionally, the B is 0.892, and the significance level (p-value) is 0.000, indicating that this relationship is statistically significant. Overall, the regression analysis results demonstrate a strong positive impact of environmental awareness on the market share of new energy vehicles. Therefore, H_a is supported.

4.4 The Impact of Government Policies on the Market Share of New Energy Vehicles

Table 4.4 Correlation Analysis of Government Policies on the Market Penetration of New Energy Vehicles

Dimension	Economic Incentives	Construction of Charging Infrastructure	Government Policies
Economic Incentives	1		
Construction of Charging Infrastructure	0.779**	1	
Government Policies	0.883**	0.728**	1

According to the correlation analysis in Table 4.4, there is a significant positive relationship between government policies such as economic incentives and the construction of charging infrastructure, and market share ($r=0.883$ and 0.729, $p<0.01$). This suggests that government economic incentives and the development of charging infrastructure play a crucial role in promoting the growth of market share for new energy vehicles. Specifically, by offering economic incentives and expanding charging infrastructure, governments can effectively stimulate consumer demand and encourage investments in new energy vehicles, thereby fostering market share expansion.

Table 4.5 Regression Analysis of the Government Policies on the Market Share of New Energy Vehicle

	Non-standardized coefficient		Standardized coefficient	t	p	R^2	Adjusting R^2	F
	B	Standard Error	Beta					
(Constant)	0.677	0.069	-	4.383	0.000			
Government Policies	0.731	0.054	0.683	13.250	0.000	0.624	0.647	169.565

The regression analysis (Table 4.5) of government policies on the market share of new energy vehicles shows that the R^2 value of the regression model is 0.642. This

indicates that the government policies variable can explain approximately 64.2% of the variation in the market share of new energy vehicles. This suggests that government policies is an important factor influencing the market share of new energy vehicles. Additionally, the B is 0.731, and the significance level (p-value) is 0.000, indicating that this relationship is statistically significant. Overall, the regression analysis results demonstrate a strong positive impact of government policies on the market share of new energy vehicles. Therefore, H_b is supported.

4.5 The Impact of Technical Characteristics on the Market Share of New Energy Vehicles

Table 4.6 Correlation Analysis of the Technical Characteristics on the Market Share of New Energy Vehicle

Dimension	Battery Technology	Range Anxiety	Technical Characteristics
Battery Technology	1		
Range Anxiety	0.750**	1	
Technical Characteristics	0.821**	0.771**	1

According to the correlation analysis in Table 4.6, there is a significant positive relationship between technical characteristics such as battery technology and range anxiety, and market share ($r=0.821$ and 0.771, $p<0.01$). This indicates that advancements in technical features, particularly improvements in battery technology, and effective management of range anxiety, significantly influence the growth of market share for new energy vehicles. Specifically, as battery technology advances and consumer concerns about range anxiety diminish, consumers are more inclined to choose new energy vehicles, thereby driving the expansion of their market share.

Table 4.7 Regression Analysis of the Technical Characteristics on the Market Share of New Energy Vehicle

	Non-standardized coefficient		Standardized coefficient	t	p	R^2	Adjusting R^2	F
	B	Standard Error	Beta					
(Constant)	0.732	0.057	-	5.309	0.000			
Technological Characteristics	0.677	0.074	0.712	31.589	0.000	0.561	0.574	170.306

The regression analysis (Table 4.7) of technical characteristics on the market share of new energy vehicles shows that the R^2 value of the regression model is 0.561. This indicates that the technical characteristics variable can explain approximately 56.1% of the variation in the market share of new energy vehicles. This suggests that technical characteristics is an important factor influencing the market share of new energy vehicles. Additionally, the B is 0.677, and the significance level (p-value) is 0.000, indicating that this relationship is statistically significant. Overall, the regression analysis results demonstrate a strong positive impact of technical characteristics on the market share of new energy vehicles. Therefore, H_c is supported.

Chapter 5 Conclusion and Recommendations

5.1 Introduction

This chapter provides a summary of the entire study, focusing on the impacts of environmental awareness, government policies, and technological characteristics on the market share of new energy vehicles. Through empirical analysis, the effects of these factors have been specifically validated. The empirical test results are summarized, and research conclusions are distilled from them. Accordingly, policy recommendations are proposed. The chapter also discusses future research directions to further advance the sustainable development of the new energy vehicle industry.

5.1 Conclusion

5.1.1 Environmental Awareness Has a Positive Impact on the Market Share of New Energy Vehicles

The data analysis results indicate that consumers' environmental awareness significantly and positively impacts the market share of new energy vehicles. This further underscores that heightened environmental awareness among consumers significantly drives their decisions to purchase new energy vehicles. As consumers' environmental awareness increases, their inclination to purchase new energy vehicles also grows, highlighting the crucial role of fostering environmental consciousness in expanding the market share of new energy vehicles.

Implement a comprehensive education program to raise awareness of the environmental benefits of new energy vehicles. This can be achieved by working with educational institutions, environmental NGOs and the media. Use social media and digital marketing strategies to highlight the positive environmental impact of NEVs, showcasing real-world examples and testimonials from existing NEV users.

Enhancing the brand influence of new energy vehicles in the field of environmental protection. New energy vehicle companies can emphasize their environmental advantages through advertising, media coverage, and other means to increase brand awareness and reputation among the public. Additionally, expanding sales channels such as online sales, automotive supermarkets, and exclusive stores allows consumers to conveniently learn about and purchase new energy vehicles, thereby supporting environmental conservation efforts. Hosting environmentally themed auto shows to showcase the company's strengths in eco-friendly technology and sustainable development attracts more attention and recognition. By optimizing the environmental performance of new energy vehicles, enhancing user experience and satisfaction, the brand's reputation and influence in the environmental protection sector can be strengthened.

5.1.2 Government Policies Have a Positive Impact on the Market Share of New Energy Vehicles

Government policies have a significant impact on the market share of new energy vehicles, demonstrating a potent effect in enhancing their market penetration. Specifically, there is a strong correlation between economic incentives and the construction of charging infrastructure, highlighting the importance of well-designed government policies. These policies not only incentivize the purchase of new energy vehicles but also create a favorable market environment conducive to the growth of the new energy vehicle industry.

For consumers purchasing new energy vehicles, maintaining certain purchase tax reductions to lower the cost of acquiring these vehicles is essential. Additionally, providing tax incentives for new energy vehicles, such as vehicle and vessel taxes, insurance premiums, and annual inspection fees, further reduces the operational costs associated with using new energy vehicles. This approach aims to stimulate demand in the new energy vehicle market. Furthermore, establishing and enhancing charging infrastructure with policy-supported investments in charging stations and piles is crucial. This includes installing charging piles in urban centers, commercial districts, and residential areas to alleviate the challenges of charging new energy vehicles and improve their convenience. Strengthening the guidance, operation, and management of charging infrastructure, gradually integrating them into public transportation service management, enables diverse energy supply methods.

Supportive policies should establish a recycling system for new energy vehicles, ensuring the proper handling and recycling of discarded batteries, scrap vehicles, and other components. This initiative aims to enhance the environmental sustainability of new energy vehicles, boost consumer confidence and acceptance, and strengthen their environmental credentials. Governments can implement recycling subsidies as part of these policies, offering economic incentives for the recycling of batteries, scrap vehicles, and other components to encourage consumer adoption of new energy vehicles. Establishing regulatory mechanisms for the recycling of new energy vehicles is essential to ensure standardized and transparent recycling processes. This enhances consumer trust in the recycling policies for new energy vehicles, promotes their active adoption, and stimulates the development of the new energy vehicle market.

5.1.3 Technical Characteristics Have a Positive Impact on the Market Share of New Energy Vehicles

Technological characteristics significantly influence the expansion of market share for new energy vehicles, with technological advancements playing a key role in driving consumer choice towards these vehicles. The strong positive correlation between battery technology and range anxiety with market share underscores the critical impact of charging-related innovations on consumer satisfaction and decision-making. This

emphasizes the ongoing need for innovation and development in the new energy vehicle sector to address consumer concerns, enhance vehicle performance, and ultimately promote widespread adoption of these environmentally friendly transportation options.

There is a need to increase government support for the new energy vehicle industry, encouraging companies to enhance investment and supporting the research and development of new energy vehicle technologies to reduce production costs. Accelerating the standardization and normalization of new energy vehicles is essential, establishing unified standards and regulations to improve their quality and safety. Promoting the integration of new energy vehicles with renewable energy sources is crucial, establishing a coordinated development mechanism to foster sustainable energy. Expanding new approaches to promote the use of new energy vehicles involves encouraging companies to engage in vehicle leasing services, thereby lowering the barriers for consumers to purchase and use new energy vehicles.

5.2 Recommendation

1) Leverage Government Policies to Support Markets:

Encourage the formulation and implementation of policies that are conducive to the expansion of new energy vehicle charging infrastructure and provide more convenience for potential and existing new energy vehicle users.

Cooperate with government agencies to incorporate new energy vehicles into public transportation fleets and government service vehicles, and set a public example for the application of new energy vehicles.

2) Leveraging Technological Advances:

Continue to invest in research and development to improve new energy vehicle battery technology to achieve longer driving range, shorter charging time and longer battery life. This addresses one of the main concerns consumers have about NEV adoption.

Based on the unique advantages of new energy vehicles, it integrates advanced technologies such as autonomous driving functions, intelligent connectivity, and innovative interior design to enhance user experience.

Partner with technology companies to co-develop new features and services, such as vehicle-to-grid services, that can be enabled by the electric powertrain and connectivity of new energy vehicles.

By implementing these recommendations, companies in the new energy vehicle industry can not only increase their market share in China, but also make significant

contributions to global environmental sustainability. The synergy among environmental awareness, government policies, and technological advancements is crucial for achieving widespread adoption of new energy vehicles and driving the transformation of the green vehicle industry.

References

Chen, Y. S., & Chang, C H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics*, *114*(3), 489-500.

Chen, L., & Wang, B. (2015). Evaluation of the effectiveness of "demand-side" innovation policies for new energy vehicles based on the full life cycle cost theory. *Science of Science and Management of S&T*, *36*(11), 15-23.

Ding, P., Ma, T., & Ma, Y. (2022). Factors influencing sales of new energy vehicles based on online reviews. *Systems Science & Mathematics*, *42*(10), 2647-2664.

Duan, S., Yu, F., & Guan, L. (2020). Government governance innovation in the data era: A perspective based on data openness and sharing. *E-Government*, (9), 74-83.

Fishbein, M., Ajzen, I., & Hill, R. J. (1977). Belief, attitude, intention and behavior: An introduction to theory and research. *Contemporary Sociology*, 6(2).

Gao, J., Tong, X., & He, C. (2023). The impact of leading markets on the new energy technology transition of China's automotive industry. *Journal of Peking University (Natural Science Edition)*, 1-11.

Helveston, J. P., Liu, Y., & Feit, E. M., et al. (2015). Will subsidies drive electric vehicle adoption? Measuring consumer preferences in the U.S. and China. *Transportation Research Part A: Policy and Practice*, 73, 96-112.

Hill, R. B. R., & J. B. (1977). Belief, attitude, intention and behavior: An introduction to theory and research by Martin Fishbein, Icek Ajzen. *Contemporary Sociology*, *6*(2), 244-245.

Hoen, A., & Koetse, M. J. (2014). A choice experiment on alternative fuel vehicle preferences of private car owners in the Netherlands. *Transportation Research Part A: Policy and Practice*, 61, 199-215.

Hu, W., & Xia, B. (2023). Disruptive technology policy: Construction and empirical analysis of technology roadmap framework—A case study of China's new energy vehicle industry. *Science and Technology Progress and Policy*.

Huang, X., & Jianping, G. (2019). Electric vehicle development in Beijing: An analysis of consumer purchase intention. *Journal of Cleaner Production*, 216.

Jia, J., & Zhao, X. (2022). Battery range and recycling strategies in the supply chain of new energy vehicles under government subsidies. *Journal of Systems Engineering*, *37*(03), 330-343.

Le, W., Xie, J., & Liu, Q., et al. (2022). Study on the correlation and coupling effects of policies in the new energy vehicle industry. *Management Journal*, *35*(05), 65-81.

Li, C., & Deng, W. (2019). A review of the spillover effects of corporate environmental behavior. *Environmental Protection Science*, *45*(4), 98-104.

Li, C., Ye, L., & Wang, L. (2021). The impact of new energy vehicle consumption promotion policies on potential consumers' purchase intentions. *China Management Science*, *29*(10), 151-164.

Li, P., Wang, A., & Yang, Y. (2018). A review of the factors influencing green consumption intentions. *Soft Science*, *32*(2), 136-140.

Li, X., Gu, Z., & Xu, Y. (2022). The impact of public environmental demands on corporate pollution emissions: Micro evidence from Baidu environmental searches. *Journal of Finance and Economics*, *48*(01), 34-48.

Long, J. (2014). Research progress and implications on factors influencing inter-departmental sharing of government information resources. *Information and Documentation Services*, 2014(2), 44-51.

Lu, Y., & Li, G. (2019). Analysis of users' continuous knowledge sharing behavior in the online environment: A comparison of TRA, TPB, and the theory of continued use. *Library Theory and Practice*, (3), 50-55.

Lu, Y., & Li, G. (2019). Analysis of users' sustained knowledge sharing behavior in online environment: A comparison of TRA, TPB, and the theory of continued use. *Library Theory and Practice*, (3), 50-55.

Lucas, S., Will, G., & Gordon, B., et al. (2019). Quantifying the impact of U.S. electric vehicle sales on light-duty vehicle fleet CO 2 emissions using a novel agent-based simulation. *Transportation Research Part D*, 72.

Netemeyer, R. G., Maxham, J. G., & Pulling C. (2005). Conflicts in the work-family interface: Links to job stress, customer service employee performance, and customer purchase intent. *Journal of Marketing*, *69*(2), 130-143.

Prateek, M., Nitin, S., Anoop, K. G. (2016). An empirical approach to consumer buying behavior in Indian automobile sector. *Industrial and Commercial Training*, *48*(3).

Qiu, Z. (2005). The co-construction of technology and organization: A case study of information technology application in manufacturing enterprises. *Sociological Studies*, (2), 32-54.

Rao Y, Xiong Y, Xu W. (2022). Heterogeneous impacts of dual credit policy on financial performance of upstream and downstream enterprises in the new energy vehicle industry. *Systems Engineering-Theory & Practice*, *42*(9), 2408-2425.

Rezvani, Z., Jansson, J., & Bodin, J. (2015). Advances in consumer electric vehicle adoption research: A review and research agenda. *Transportation Research Part D: Transport and Environment*, 34, 122-136.

Wang, H., Ma, B. L., & Bai, R. B. (2020). The spillover effect of greenwashing behaviours: An experimental approach. *Marketing Intelligence & Planning*, *38*(3), 283-295.

Xiong, Y., & Liu, H. (2022). The role and differences of "non-subsidy" policies in promoting the application of new energy vehicles. *Science Research Management*, *43*(09), 83-90.

Yang, K., Zhang, Q., & Yu, L. (2023). Research on purchase intention and nudging policies for new energy vehicles based on consumer values and bounded rationality. *Management Review*, *35*(01), 146-158.

Zhang, T., & Qian R. (2022). German road traffic law entering the era of autonomous driving: Exploration and implications of Germany's automated driving act. *German Studies*, *27*(01), 85-101.

Zhang, C. (2022). Reconsidering the marketing value of television advertising in the context of deep integration. *Television Research*, (389), 80-82.

Appendix

Questionnaire on New Energy Vehicle Market Insights

Hello, Sir/Madam!

Thank you very much for taking the time to participate in our survey - “New Energy Vehicle Market Insights”. Your opinions and feedback are crucial to our understanding of the current status of the new energy vehicle market and its development trends.

We know your time is valuable, so your participation and support are especially appreciated. Please be assured that all information collected will be used for academic research purposes only, and we are committed to protecting your personal privacy.

We look forward to your valuable comments and suggestions to help us deeply understand consumer needs and thereby contribute to the development of new energy vehicles.

I. Basic information

1) Your gender: □ male □ female.
2) Your age: □ 18-24 □ 25-34 □ Over 35.
3) Educational level: □High school/Technical secondary school
   □Junior college □Bachelor's degree
   □Master's degree or above

II. The New Energy Vehicle Market Insights Survey

According to the actual situation, please use Likert five-point scale to evaluate the following statements about fine management. Among them, 1 means "Strongly disagree" and 5 means "Strongly Agree".

	Questions	Option				
		1	2	3	4	5
Environmental Awareness	I think buying new energy vehicles is an effective way to reduce environmental pollution.					
	I am willing to pay extra to buy new energy vehicles for the sake of environmental protection.					
	Environmental protection is one of the main considerations when you purchase a new energy vehicle.					
	I believe that new energy vehicles can improve my quality of life while reducing the impact on the environment.					

	Environmental performance is an important factor that I consider when choosing a car.					
Government Policies	The government-provided vehicle purchase subsidy makes me more inclined to buy new energy vehicles.					
	The policy of exempting from purchase tax has increased my willingness to buy new energy vehicles.					
	The price of electric vehicles is the primary factor for me when making a purchase.					
	Government support for new energy vehicles makes me more optimistic about their market prospects.					
	The construction of more charging infrastructure would encourage more people to switch to electric vehicles.					
	The availability of charging infrastructure is very important in my decision to purchase an electric vehicle.					
	The coverage of charging infrastructure is very important in your decision to purchase an electric vehicle.					
Technical Characteristics	I consider rapid charging capability as an essential feature that new energy vehicles should possess.					
	You have hesitated to purchase a new energy vehicle due to concerns about battery technology.					
	If the battery of a new energy vehicle suddenly runs out while driving, it will cause a lot of inconvenience.					
	The driving range of new energy vehicles meeting my daily needs is a crucial factor for my purchase.					
	I believe that new energy vehicles meet my long-distance travel needs.					