

# ***Comparative Analysis of Public Awareness of New Energy Vehicles***

## ***—Take the United States and China for Example***

**Fanhua Zhao<sup>1,a,\*</sup>**

<sup>1</sup>*College of Arts and Sciences, Ohio State University, Ohio, United States*

*a. zhao.3511@osu.edu*

*\*corresponding author*

**Abstract:** Electric vehicles are attracting increasing attention worldwide due to concerns about climate change and sustainability. However, global adoption of electric vehicles is still relatively low. This paper will investigate and analyze the public awareness of new energy vehicles in the United States and China, compare the differences in public awareness between the two countries, analyze the reasons for the differences, and suggest suggestions to improve public awareness of new energy vehicles. The study finds that, on the whole, the Chinese public's awareness of new energy vehicles is higher than that of the American public. The main reasons for the difference include the influence of cultural background and values, the role of media publicity and education, and the differences in policy and market environment. To improve public awareness of new energy vehicles, the United States needs to strengthen publicity and education, and improve policies and infrastructure, while China needs to increase media publicity, improve policy guidance, and improve product and service quality.

**Keywords:** Public awareness, new energy vehicles, China, United States.

## **1. Introduction**

One of the major barriers is the lack of public awareness and acceptance of this new technology. Therefore, it is important to examine and compare the public perception of EVs across different countries, which will shed light on improving awareness-raising strategies. The United States is one of the important markets for new energy vehicles globally. Although early market growth was slow, with new energy vehicle sales accounting for less than 0.5% of new vehicle sales in 2012, penetration rates have increased significantly in recent years, reaching about 2% in 2018-2019 [1]. This may be due to the combined effect of various factors, including policy incentives, technological progress, the introduction of new models, and increased public awareness and acceptance of new energy vehicles [1]. In order to advertising the electric cars, the U.S. federal and state governments have implemented several policies to promote the adoption of new energy vehicles, mainly including financial incentives and infrastructure construction [2]. Since 2010, the federal government has provided an income tax credit of up to \$7,500 for the purchase of new energy vehicles, but with a limit of 200,000 vehicles per manufacturer, after which the credit gradually decreases [3]. States have also introduced subsidy policies, such as California's Clean Vehicle Rebate Program, which provides purchase

subsidies of up to \$9,500 but mainly targets low- and middle-income groups [1]. In addition, non-financial incentives, such as free or discounted use of HOV lanes and public charging subsidies, have also helped to promote new energy vehicle sales [4].

Although policy incentives have helped to promote the adoption of new energy vehicles, empirical studies have shown that their cost-effectiveness is problematic. Most car buyers may have purchased new energy vehicles even without subsidies, resulting in subsidies being mainly obtained by high-income groups. Sheldon summarizes that the marginal effect of the federal tax credit is only 14-50%, meaning that for every 3 new energy vehicles sold, 2 are not purchased because of the subsidy [5]. The subsidy cost per additional new energy vehicle is as high as \$30,000-35,000, exceeding the price of some models [1]. To be more specific, new energy vehicles have advantages in reducing greenhouse gas and air pollutant emissions, but actual environmental benefits may be lower than expected. Studies have shown that due to the fossil fuel-based electricity structure in some regions, the net carbon emission benefits of new energy vehicles are limited or even negative [6]. Moreover, environmental benefits are more significant in high-income communities [6]. In addition, actual usage intensity far lower than traditional vehicles also limits the realization of overall emission reduction potential.

China is the world's largest new energy vehicle market. In 2023, the market size reached US\$90.9 billion and is expected to maintain an average annual growth rate of 17.82% in the coming years [7]. The Chinese government attaches great importance to the development of the new energy vehicle industry and has formulated a series of promotion policies and development plans, striving to achieve a 20% penetration rate of new energy vehicle sales by 2025. The reason why this will happen is mainly because financial and tax incentives are important policy tools to promote the development of new energy vehicles in China. Since 2009, the central government has successively introduced preferential measures such as purchase subsidies and tax reductions, and local governments have also formulated supporting policies [2]. In 2020, the central and local governments allocated a subsidy budget of over 30 billion yuan for new energy vehicles, with a maximum subsidy of 25,000 yuan per vehicle [8]. Tax incentives such as exemption from vehicle purchase tax and vehicle and vessel tax have also significantly reduced the ownership cost of new energy vehicles.

In this way, to complement the financial and tax incentive policies, the Chinese government has vigorously promoted the construction of charging infrastructure. By the end of 2020, a total of 1.075 million public charging piles and about 1.5 million private charging piles had been built nationwide, with charging facilities coverage exceeding 50% in highway service areas [9]. Non-economic incentive measures such as license plate restrictions and parking discounts have also helped to increase the attractiveness of new energy vehicles in some cities. As a result, the central and local governments have guided enterprises to increase investment and promote breakthroughs in key core technologies through the formulation of industrial plans and support. Domestic enterprises have made significant progress in power batteries, motor electric control, and other fields, and their market competitiveness has been continuously enhanced [10]. International car companies have also accelerated their deployment in China, and the production of Tesla's Shanghai factory has made an important contribution to expanding the scale of China's new energy vehicle market. China's new energy vehicle industry has achieved leapfrog development, with significant improvements in technological level, enterprise competitiveness, and consumer acceptance.

This study compares the public awareness of EVs in the United States and China - the two largest EV markets. Specifically, it attempts to address the following research questions: first, what are the general perception levels toward EVs among American and Chinese consumers? Second, what factors shape public opinions on EVs in the two countries? Third, what are the major differences in awareness and acceptance levels of EVs? Forth, what policy suggestions can be provided to enhance public knowledge of EVs based on the identified perception gaps? By conducting surveys and

secondary data analysis, this study compares the recognition of EV advantages/disadvantages, attitudes towards government policies, influences of cultural values, and media publicity across the American and Chinese public. It further discusses the reasons behind awareness divergence and puts forward tailored recommendations for both countries to facilitate EV adoption by raising public knowledge and interest. The findings will contribute to the literature on the technology acceptance model and provide policy insights for leveraging public support toward sustainable transportation globally.

## **2. Current Development Status of New Energy Vehicles**

### **2.1. Survey Methods and Data Sources**

To have a better understanding of the American public's awareness of new energy vehicles, researchers have employed various survey methods, including questionnaires, focus group interviews, and in-depth personal interviews. The data mainly comes from consumer survey projects conducted by academic institutions and industry organizations, such as the "New Energy Vehicle Consumer Survey" by the Transportation Research Institute and the "Electric Vehicle Purchase Intention Study" by J.D. Power [11]. These databases contain consumer samples from different regions and demographic characteristics, which have a certain degree of representativeness. Overall, the American public's awareness of new energy vehicles is still relatively limited. According to the data, most respondents have insufficient knowledge about the basic characteristics of new energy vehicles, such as driving range and charging time, and there are many misunderstandings. Less than 1/4 of people believe that the driving range of pure electric vehicles can meet daily commuting needs. Compared with traditional vehicles, the public also has concerns about the environmental benefits, driving performance, and safety of new energy vehicles [12].

On the other hand, some consumers have a positive attitude towards new energy vehicles. According to survey, nearly 40% of American consumers said they would consider purchasing a new energy vehicle [3]. The main driving factors include environmental awareness, reduced operating costs, and the driving pleasure brought by advanced technology (Singer, 2016). The groups with a positive attitude towards new energy vehicles are mostly young, highly educated, high-income consumers living in metropolitan areas [11].

### **2.2. Factors Influencing American Public Awareness**

Several factors influence the American and China public's awareness of new energy vehicles including personal background characteristics, information channels, social influences, etc. For the American public, younger, highly educated consumers with strong environmental awareness are more likely to accept new energy vehicles [11]. Exposure to professional reviews and recommendations from friends and family helps to improve awareness levels [13]. The more opportunities to see new energy vehicles in life, the more intuitive the perception of their advantages [14]. In addition, the social atmosphere created by policy publicity and charging infrastructure construction will also affect public attitudes [11]. Overall, improving awareness relies on integrating multiple education and publicity channels and social support.

## **3. Chinese Public Awareness of New Energy Vehicles**

### **3.1. Survey Methods and Data Sources**

Domestic scholars use questionnaire surveys, in-depth interviews, and other methods to study the Chinese public's awareness of new energy vehicles. The samples are mainly concentrated in first-tier

cities such as Beijing, Shanghai, Guangzhou, and Shenzhen, and the representativeness needs to be improved. The "China New Energy Vehicle Consumer Awareness and Demand Survey" released by the China Automotive Technology and Research Center has been a relatively large-scale industry survey project in recent years [15]. In addition, institutions such as the China Society of Automotive Engineers and the China Consumers Association have also conducted relevant surveys.

### **3.2. Main Aspects and Characteristics of Awareness**

The Chinese public has a relatively high awareness of the environmental advantages and policy support for new energy vehicles but lacks awareness of technical principles and supporting facilities. According to a survey by the China Automotive Technology and Research Center, more than 70% of consumers know that new energy vehicles are conducive to energy conservation and emission reduction, but less than 40% of people understand concepts such as battery degradation and power consumption. Most people have range anxiety and worry about insufficient range and inconvenient charging. Compared with the United States, Chinese consumers have stronger concerns about the safety of new energy vehicles, with nearly 60% worried about the risk of battery self-ignition [15]. On the other hand, respondents generally recognize the social benefits of new energy vehicles and are willing to pay a premium for environmental protection and technological progress. With the rapid development of domestic brands, consumers' evaluation of the cost-effectiveness of independent new energy vehicles has increased [15]. Due to the demonstration and policy incentives in first-tier cities, public acceptance of new energy vehicles continues to increase.

### **3.3. Factors Influencing Chinese Public Awareness**

Factors influencing Chinese public awareness of new energy vehicles include both individual-level and social-contextual factors. Environmental awareness and innovative spirit are intrinsic motivations for purchasing new energy vehicles [16]. Public recognition of energy conservation, emission reduction, and technological progress, as well as reactions to purchase and driving restrictions policies for traditional vehicles, objectively boost the acceptance of new energy vehicles [16]. Media publicity plays an important role in shaping the social image of new energy vehicles, linking them with environmental protection and technological progress [17]. At the same time, targeted activities such as test drives and technical seminars conducted by car companies and professional institutions help to enhance consumer confidence.

Overall, under government guidance and market promotion, the Chinese public's awareness of new energy vehicles continues to increase, and purchase intentions and social acceptance have significantly strengthened. However, there are still considerable concerns in terms of operating costs, charging convenience, after-sales service, etc. In the future, comprehensive publicity and education should be strengthened, industrial support and business models should be improved, and the consumer experience should be enhanced. At the same time, attention should be paid to the differentiated needs of different regions and groups to promote the comprehensive popularization of new energy vehicles.

## **4. Comparative Analysis of Public Awareness of New Energy Vehicles**

### **4.1. Comparison of Overall Awareness Levels**

Through surveys and research on the American and Chinese public, it has been found that the Chinese public has a higher overall awareness of new energy vehicles than the American public. According to data from the China Automotive Technology and Research Center, over 70% of Chinese consumers are aware of the basic characteristics and advantages of new energy vehicles. In contrast, Krause et

al.'s research shows that the American public's understanding of new energy vehicles is still relatively limited, with most people having misunderstandings about key indicators such as driving range and charging time [11]. This difference may be related to factors such as the development stage of the new energy vehicle industry and the intensity of government publicity in the two countries. Both the American and Chinese public recognize the advantages of new energy vehicles in terms of environmental protection, but their views on other aspects differ. American consumers are more concerned about the economics of new energy vehicles, such as fuel costs and resale value [6]. Chinese consumers, on the other hand, place more emphasis on the social benefits and technological attributes of new energy vehicles and are willing to pay a premium for environmental protection and innovation. In terms of disadvantages, the Chinese public has stronger concerns about safety, while the American public is more concerned about charging convenience and limited vehicle model choices [11].

#### **4.2. Support for and Views on Government Policies**

There are some differences in the attitudes of the two countries' publics towards new energy vehicle-related policies. For instance, Chinese consumers generally support the government's preferential policies in terms of subsidies and taxes, believing that they are conducive to improving the economics of new energy vehicles [5]. However, some people are also worried about price increases after the phase-out of subsidies. The American public has relatively low awareness of support policies such as federal tax credits and holds different views. Krause et al., pointed out that American consumers who support new energy vehicle policies are mostly environmentalists, while opponents may place more emphasis on the free market [11]. The main differences in the American and Chinese public's awareness of new energy vehicles are partly due to different cultural backgrounds and value orientations. Chinese traditional culture values collective interests and long-term development, which is conducive to public acceptance of the social benefits of new energy vehicles. American culture, on the other hand, emphasizes individualism and free choice, making consumers more concerned about the private benefits of new energy vehicles [11]. In addition, Chinese consumers generally accept government guidance, while the American public is more inclined towards market mechanisms. These differences influence the attitudes of the two countries' publics toward new energy vehicle policies.

#### **4.3. Role of Media Publicity and Education**

There are differences in media publicity and public education in the field of new energy vehicles between the United States and China. Chinese media coverage of new energy vehicles focuses on positive themes such as environmental protection and technological innovation, which have played a role in promoting social image and awareness. In contrast, although some environmental organizations in the United States promote the benefits of new energy vehicles, mainstream media coverage is relatively neutral [11]. In terms of education, the Chinese government and enterprises have organized various forms of popular science activities, such as new energy vehicle exhibitions and test drives, while the United States lacks systematic consumer education programs [8].

#### **4.4. Differences in Policy and Market Environments**

There are significant differences between the United States and China in terms of the development stage of the new energy vehicle industry and infrastructure levels, leading to different public awareness and acceptance. The Chinese government has prioritized the cultivation of the new energy vehicle industry as a strategic emerging industry and has introduced a comprehensive policy support system. In contrast, policy support from the U.S. federal government is limited, relying mainly on

market pull [1]. In terms of infrastructure, the construction speed of China's charging network is relatively fast, while the number of public charging piles in the United States is relatively insufficient. The differences in policy guidance and supporting facilities objectively affect public perception and willingness to purchase new energy vehicles.

In summary, there are certain differences in the American and Chinese public's awareness of new energy vehicles, with China having a higher overall level of awareness. These differences are influenced by multiple factors such as cultural background, values, media publicity, policy, and market environments. In the future, the two countries should carry out targeted public education and guidance based on their characteristics and improve society's understanding and acceptance of new energy vehicles. At the same time, international exchanges and cooperation should be strengthened to share experiences and lessons, and jointly promote the healthy development of the global new energy vehicle industry.

## **5. Suggestions for Improving Public Awareness of New Energy Vehicles**

### **5.1. Suggestions for the United States**

To address the limited public awareness of new energy vehicles in the United States, it is essential to strengthen publicity and educational activities. Government agencies, industry associations, and automakers should collaborate to launch targeted campaigns to introduce the benefits, policies, and technological advancements of new energy vehicles [11]. Educational programs in schools and communities can help cultivate environmental awareness and promote the acceptance of new energy vehicles among younger generations [11]. Organizing test drives, exhibitions, and other experiential activities can provide consumers with opportunities to directly interact with new energy vehicles and better understand their advantages [8].

For America, they should Improving policies and infrastructure is crucial for creating a supportive environment for new energy vehicle adoption in the United States. The federal government should consider extending and optimizing the tax credit policy to make it more accessible and beneficial to a wider range of consumers [1]. State and local governments can introduce more targeted incentives, such as rebates, preferential parking, and HOV lane access, to encourage the purchase and use of new energy vehicles. Accelerating the construction of charging infrastructure, especially in public spaces and along highway networks, can alleviate range anxiety and enhance the convenience of using new energy vehicles. What's more, promoting technological innovation and cost reduction is key to making new energy vehicles more attractive to American consumers. Increased investment in research and development can help advance battery technology, improve vehicle performance, and extend driving range [1]. Collaborations between industry, academia, and government can accelerate the pace of innovation and bring cutting-edge technologies to market faster [11]. As production scales up and technology matures, the cost of new energy vehicles is expected to decline, making them more affordable and competitive with traditional vehicles [1].

### **5.2. Suggestions for China**

For China, they should further increase media publicity efforts to maintain and enhance public awareness of new energy vehicles. Mainstream media outlets can continue to highlight the environmental and social benefits of new energy vehicles, as well as showcase the latest technological advancements and policy support [14]. Social media platforms can be leveraged to engage younger audiences and foster a positive image of new energy vehicles. Collaborations with industry influencers, such as automotive experts and eco-conscious celebrities, can help amplify the reach and impact of publicity campaigns [8].



Strengthening policy guidance and support is essential for sustaining the growth momentum of China's new energy vehicle market. As subsidies phase out, the government should explore alternative incentive mechanisms, such as tax breaks, preferential financing, and carbon trading schemes, to continue encouraging the adoption of new energy vehicles. Policies should also focus on supporting the development of a robust domestic supply chain, including battery production, charging infrastructure, and after-sales services. Clear long-term policy signals can provide stability and confidence for industry players and consumers alike.

Improving product quality and service levels is critical for addressing consumer concerns and enhancing the overall user experience of new energy vehicles in China. Automakers should invest in research and development to improve vehicle safety, reliability, and performance, particularly in areas such as battery technology and thermal management. Strengthening quality control and implementing stricter safety standards can help alleviate public concerns about battery fires and other potential risks [8]. Expanding the network of authorized service centers and improving after-sales support can provide consumers with more convenient and reliable maintenance options[8]. In conclusion, improving public awareness and acceptance of new energy vehicles requires concerted efforts from governments, industry stakeholders, and society as a whole. The United States should focus on strengthening publicity and education, improving policies and infrastructure, and promoting technological innovation and cost reduction. China should continue to increase media publicity efforts, strengthen policy guidance and support, and improve product quality and service levels. By tailoring strategies to their specific contexts and learning from each other's experiences, both countries can accelerate the transition to a more sustainable transportation future.

## 6. Conclusion

This paper compares the American and Chinese public's awareness of new energy vehicles (NEVs) through surveys and literature reviews. Findings show that the Chinese public has a higher overall awareness of NEVs due to cultural differences, positive media coverage, and comprehensive government support. However, both countries face challenges such as lack of understanding of NEV technologies, range anxiety, and limited beneficiary groups. What's more, in order to improve NEV awareness and acceptance, the study suggests that the United States should strengthen publicity and education, improve subsidy policies and infrastructure, and increase investment in innovation. For China, recommendations include increasing media publicity, improving long-term support policies, and enhancing product quality and service.

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