Why people want to buy electric vehicle: An empirical study in first-tier cities of China

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Abstract

Electric vehicles are considered to be one of the most important ways for China to solve a series of energy problems such as urban smog, energy supply security and turning to green development. With the powerful support provided by the government, China has become the world’s largest electric vehicle market and continues to maintain a high-speed growth. This paper examines the factors that may affect the public’s purchasing intention of electric vehicles via a survey. An electric vehicle purchasing intention model is proposed based on the literature review and the reality in China. The model takes into consideration a number of demographic characteristic factors and attitude factors. A survey was conducted in China’s four largest cities which include: Beijing, Shanghai, Guangzhou and Shenzhen. Based on the survey data, the paper examines the public’s cognition of each influencing factor and analyses the impacts of these factors. The results reveal that attitude factors such as network externality, price acceptability, government subsidies, vehicle performance, environmental concerns, and demographic characteristics such as gender, age and marital status have significant impact on respondents’ willingness to purchase electric vehicles. The finding of this paper provides constructive advices to diverse stakeholders.

1. Introduction

Air pollution has become a serious problem in urban areas of China. Especially in the large cities, highly concentrated contaminants, including airborne particulate matter, SO₂ and NOₓ, have caused millions of people to die every year (Rohde and Muller, 2015). Smog is the most familiar form of air pollution, which is now one of the most important public concerns in China. In the Hazardous smog days, the government often issues “red alert” and impose regulatory measures such as traffic restrictions based on even and odd numbered license plates. Emissions generated by driving vehicles are considered to be a critical factor causing the smog pollution (Zhang et al., 2014; Huang et al., 2016). Vehicle ownership of China has grown rapidly in recent years (Lin and Xie, 2013). If the oil consumption rate of vehicle rises to the level of United State, which is as high as 70% (Davis et al., 2016), China may consume more than 1 billion ton oil per year. The rapid and sustained growth of vehicle energy consumption has raised concerns over local air pollution, carbon dioxide emissions, and national energy security (Yin et al., 2015; Du and Ouyang, 2017). If no restrictions are exerted to the use of vehicles in China, the support of such large energy consumption may be unsustainable in the future years (Wang et al., 2014).

The adoption of electric vehicles (EV), which is considered as the main trend in the future’s development of China transportation sector, is now implemented as a long-term solution to the problems mentioned above. Benefiting from the powerful supports offered by the government, China is now the largest EV consumer and manufacturer in the world. Table 1 lists the sales number of new energy vehicle (NEV) and EV of China in recent years. The NEV market of China is often segmented into EV, plug-in hybrid vehicle (PHEV) and others like fuel cell vehicle (FCV) and capacitance vehicle (CV). Most of the market share is occupied by EV which is powered solely by electricity and the PHEV which having both electric motor and internal combustion engine. Presently, support policies in China are focused on the EV market and...
Table 1
Sales of new energy vehicle in China.

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<tbody>
<tr>
<td>New energy vehicle</td>
<td>8159</td>
<td>12,791</td>
<td>17,642</td>
<td>74,763</td>
<td>331,092</td>
<td>493,806</td>
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<tr>
<td>Electric vehicle</td>
<td>5579</td>
<td>11,375</td>
<td>14,604</td>
<td>45,049</td>
<td>247,482</td>
<td>400,916</td>
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<td>Overall vehicle</td>
<td>18,505,114</td>
<td>19,306,435</td>
<td>21,984,079</td>
<td>23,491,893</td>
<td>24,597,583</td>
<td>28,028,175</td>
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<td>EV proportion</td>
<td>0.03%</td>
<td>0.06%</td>
<td>0.07%</td>
<td>0.19%</td>
<td>1.01%</td>
<td>1.43%</td>
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* The sales number of new energy vehicle include the electric vehicle and other type of vehicle such as PHEV, PCV and CV.
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