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## Assessment of the incentives on electric vehicle promotion in China



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### ABSTRACT

New Electric vehicles (NEVs) will not only solve the energy and environmental problems, but also promote reform and transformation of Chinese automotive industry. To promote the market acceptance of NEVs, Chinese government has launched NEV demonstration projects and issued numerous policies since 2009, which absolutely promoted NEV sales, but also resulted in a subsidies-oriented NEV market. Therefore, Chinese government decided to decrease NEV subsidies gradually in next 5 years. In order to explore the key factors that promote NEV sales, and based on which to offer suggestions on designing and formulating matching policies when subsidies decrease, we utilized multiple linear regression method to analyze electric vehicle (EV) sales with incentive measures and socio-demographic data of 41 pilot cities for year 2013–2014. The result shows that chargers' density, license fee exemption, no driving restriction, and give priority to charging infrastructure construction lands are the four most important factors, which could be continued and strengthened in next few years to keep EV market still present a perfect performance.

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## 1. Introduction

### 1.1. The background of developing NEVs

Since China became the world's largest car market in 2009 ([Ministry of Commerce of the People's Republic of China, 2010](#)), the Chinese car ownership has been maintaining a stable and continuous growth. As of the end of 2015, China civilian car ownership has exceeded 170 million vehicles, car ownership per thousand population reached 125 ([National Bureau of Statistics of the People's Republic of China, 2016](#)). It is estimated that in 2020, China civilian car ownership will reach 250 million units, car ownership per thousand population to 174 ([China Association of Automobile Manufacturers, 2015](#)). Compared to the number of the major developed countries (over 500 cars) and world average level (183 cars), Chinese car market still has a large growth space ([China Association of Automobile Manufacturers, 2012](#)). China automobile industry is in a rapid development, but it also brings energy safety, environmental pollution, traffic congestion and a series of problems at the same time. China's dependency on imported oil exceeded 60 percent for the first time in 2015 and is expected to rise to 80 percent by 2030 ([Rühl and Giljum, 2012](#)), the national energy security situation is extremely grim. China's oil import dependency degree and fuel consumption of vehicles from 2000 to 2015 are as shown in [Fig. 1](#).

In addition to energy security issues, the issue of carbon emissions caused by the automobile industry has become more and more severe. The automobile carbon dioxide emissions in the developed countries accounted for 25 percent of total

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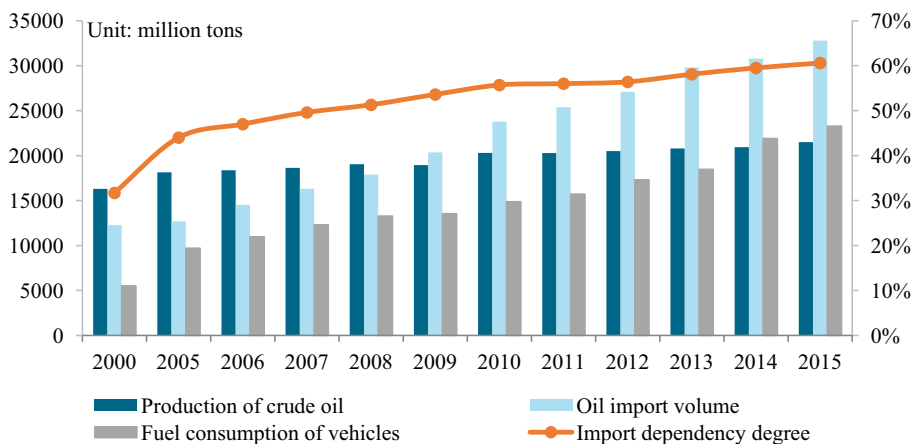


Fig. 1. China's oil import dependency degree and fuel consumption of vehicles for 2000–2015.

amount. According to the data, experts predict that the value in China is about 8–10 percent. A cooperative research project jointly carried out by the Development Research Center (DRC) of the State Council of China, National Development and Reform Commission (NDRC) and Tsinghua University indicated that greenhouse gas emissions from China's transport sector are likely to be double by 2020 (Development Research Center of the State Council, 2009). On December 30, 2015, an important speech was delivered by President Xi Jinping in the opening ceremony of the Paris Conference on climate change, promising that China's carbon dioxide emissions per unit of gross domestic product in 2030 will dropped by 60–65 percent compared to 2005 (Sina News, 2015). Therefore, as one of the main sources of carbon emissions, Chinese automobile industry must reduce carbon emissions so that the target can be realized in due time.

Serious energy and environmental issues press for the reform and transformation of the Chinese automotive industry. NEVs, as an alternative to traditional vehicles, have energy-saving and environmental protection benefits Arar (2010), Smith (2010), are supposed to be the focus of the future development of the automotive industry.

## 1.2. NEV incentives and demonstrations in China

In order to promote the commercialization of NEVs, Chinese government launched two rounds of NEV demonstration project. The first round started from January 2009 to December 2012, which covered Beijing, Shanghai, Hangzhou, Dalian, Shenzhen and so on, a total of 25 pilot cities. The demonstration project first focused on the public domain (buses, special vehicles), then extended to private domain in May 2010. As the result of the first round demonstration project was far from the expectation, Chinese government issued Notice on the Continued Work to Promote the Development of NEVs, deciding to continue the demonstration project in the following three years, which was known as the second round of NEV demonstration project. The second round project covered 39 cities (city groups), a total of 88 cities. As of September 2015, the promotion results of the 39 cities (city groups) are as shown in Fig. 2. During the two rounds of NEV demonstration projects, Chinese government promulgated a series of incentives to achieve set goals, covering various aspects including production, purchase, use and charging infrastructures, as shown in Table 1.

Under the joint efforts of the central and local government as well as automobile manufacturing enterprise and other industries, the demonstration projects have made great progress so that China surpassed the United States to become the largest EV market in 2015. But with the deepening of the project, the immaturity of the NEVs' technology and infrastructure constraints were increasingly obvious. Overall, the completion rate of the demonstration was still low, only 12.8% of the cities (city groups) completed the promotion goal.

At present, the promotion of NEVs in China has gradually shifted from public domain to private domain, and there is even a bigger gap to reach the goal in private domain. What's more, NEV promotion is too dependent on policy support. To make subsidies oriented NEV market turn to market oriented and force the enterprises to develop core competitiveness, the central government decided to decrease the subsidies of NEVs step by step in the coming years and cancel the subsidies completely in 2020 (MOST, 2015). The government, experts and enterprises are all worried about if NEVs in Chinese market that have been growing up by relying on financial subsidies can fly alone after leaving "warm nest". Therefore, exploring what factors that affected NEV promotion and based on which to give suggestions for designing and formulating matching policies for the future period when subsidies decrease are extraordinarily necessary, which is this paper's main contribution. To avoid the probable "cliff" fall of NEV sales in the situation that subsidies decrease in the next few years, central and local governments could refer to the suggested measurements to alleviate the short-time negative effects (Li et al., 2016) of decreasing subsidies.

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