Study on Development of New Energy Vehicles in China
You-lin ZHANG\textsuperscript{1,a}, Zhou-xia LIU\textsuperscript{2,b,*} and Nian-qi DENG\textsuperscript{3,c}
\textsuperscript{1,2}Shanghai University of International Business and Economics, Shanghai, China
\textsuperscript{3}Shanghai University, Shanghai, China
\textsuperscript{a}youlinzhang1964@163.com, \textsuperscript{b}2217816521@qq.com, \textsuperscript{c}18225527055@163.com
*Corresponding author

Keywords: New Energy Vehicles, Energy Problem.

Abstract. New energy vehicles have a great development in China, and contribute to China’s energy structure adjustment and industrial upgrading. However, a series of problems are exposed in the process of development. This paper mainly analyses the situation of new energy vehicles, and makes some suggestions for the future development.

1. Introduction

New energy vehicles refers to some vehicles which using new power systems, wholly or mainly dependent on the new energy-powered, including pure electric vehicles, plug-in hybrid vehicles and fuel cell vehicles. Development of new energy vehicles has a strategic significance for resolving environmental pollution and protecting national energy security. China’s 12th Five-Year Plan determined new energy vehicles industry as one of the seven new strategic industries, 13th Five-Year Plan put forward a promotion plan for new energy vehicles, enhance industrialization levels of electric vehicle. With the increasing government’s support for new energy vehicles, China’s new energy automobile industry has achieved rapid development. Up to September 2015, has produced new energy vehicles 274,000, however, produced 17,000 in 2013, equivalent to the combined output of 4 years before. At the first half of 2015, Chinese brand passenger car sales 4.18 million units, new energy passenger cars accounted for 1.4% (0.32% in 2014). Although the proportion is still small, the increment is far more than the whole market.

2. The Urgency of Development of New Energy Vehicles

2.1 The scarcity of energy

China’s energy issues are very serious. Mainly contains: 1) low level of per energy consumption level. Less than half of the world’s average level, and family power consumption less than 5% compared with the developed countries; 2) low energy efficiency. Many economic departments quite backward in technology and management, causing high energy consumption, energy utilization rate is only about a third of developed countries; 3) the difficult of energy structure. Coal is the mainly energy, according to BP 2011, ultimately proved reserves of coal in China is 114.5 billion tons, but per consumption is only 86 tons. And because of the great consumption, produce-store ratio only 35 years, below the world’s average of 118; 4) the shortage of per energy resources. For oil resources, in particular, China has been a net oil import country in 1993, crude oil import dependency beyond 50% of internationally recognized cordon in 2009. In 2015, China’s oil consumption is as high as 543 million tons, and foreign oil dependency is above 60%. The limitation China’s energy threatens the nation’s energy security seriously, so it is very urgent to seek alternative sources of energy [1].

2.2 The necessity of low carbon economy

Low carbon economy is refers to a development patterns, which is, under the guidance of the concept of sustainable development, through technical innovation, system innovation, industrial
transformation, new energy development and other means, as far as possible to reduce the consumption of the coal, oil, and other high carbon energy and reduce green house gas emissions, achieving economic and social development and ecological environment protection. Comparing with the traditional combustion engine automobile, the main difference of new energy vehicles is environment friendly, to reduce the reliance on oil resources and reduce carbon dioxide emissions. New energy vehicles use electricity, gas, and biomass energy or hybrid energy, less fuel consumption and carbon dioxide emissions [2].

According to *Annual Report of China’s Motor Vehicle Pollution Prevention in 2015*, in 2014 motor vehicle emission pollutant total more than 40 million tons, including 6.27 million tons nitrogen oxides and 0.57 million tons hydrocarbons. Motor vehicle emission pollution has become the most prominent cause in the atmospheric environment pollution.

Chinese government attaches great importance to the development of new energy cars. Since the 10th five-year plan, China’s energy conservation and development of new energy vehicles have experienced a great change in support of national science and technology. 2015 annual sales volume has exceeded 300000, at the first place in the world. China is a large market, and new energy vehicles have a bigger development space in the future.

3. The Development Model of New Energy Vehicles

New energy vehicles experience integration, vertical separation, and optimize integration. New energy vehicles and production services in form of the value chain to mutual penetration, integration, separation. With the expanding of China’s auto market, the automobile industry chain is derived from a huge service industry, and tends to be cluster evolution. Gradually lead research, maintenance, logistics, supply chain finance, business and other industries, becoming the driving mode of value chain. The development model of new energy vehicles can be summed up in the following two kinds:

The micro fusion model of technology complementary and product complementary. Industry fusion can be divided into technology alternative, technology complementary, product alternative and product complementary. New energy cars rely on generic technology, basic technology of complementary and external environment influence, through the real car complement of products and services, achieve the industrial convergence. As penetration and innovation in technology in the manufacturing and service industries, it's necessary to provide products and services, eventually break the boundary between the industry, with a new mode of production, business model, new technology and new industries.

Value chain development model from driven by manufacturing to driven by service. Shanghai international automobile city “time-sharing lease” is a model of new energy vehicles from production to provide personalized service. With the integration and penetration of computer, Internet and new energy technology, personalized needs are more obvious, the traditional pattern of industrial division, integration, integration of production are turning to network organization and personalized small batch production, new energy automobile manufacturing enterprise with advanced information and communications, logistics and network platform, breakthrough the limitation of geographic space, gradually toward virtualized manufacturing enterprise development, to provide whole process service, value chain driven mode from manufacturing to service.

4. The Influence Factors of New Energy Vehicles

4.1 Channel factors

Today, “eyeball economy” is becoming the mainstream. How to effectively catch the consumer’s attention is the issue for businessman to consideration. Among these, the transmission channels play an important role, especially in the Internet age. Tesla is the success model of using the Internet thinking: Tesla has no traditional media advertisement, it depends on regular user who is keen on low carbon consumption, and these consumers will upload own driving experience to Internet,
through the Internet word of mouth spread quickly. Tesla also applies Internet thinking in marketing mode, adopt the direct sales mode, alone make supply chain which match the new company’s management system and procurement system. In terms of selling, Tesla built e-commerce platform and information acquisition system, which brings a unique purchase experience to consumers according to customer’s consumption habits and demand.

4.2 Policy factors

China’s support for new energy industry began in 2001, and in 2009, the new energy vehicles industry was promoted to a strategic height. Policy factors play a fundamental role in the spread and promotion process of new energy vehicles. Government policy supports the dissemination and promotion of new energy vehicles to win a certain market share. The current policy supports are mainly concentrated on the following three aspects:

First, infrastructure construction. Infrastructure construction has a positive correlation with new energy car sales. For example, charging pile inadequate will limit the promotion of new energy vehicles, so the improvement of the infrastructure is the necessity for development of new energy vehicles. Because of this, in March 2012, 12th five-year Special planning of the Electric Vehicle Technology Development said: until 2015, China will form a system power supply network, more than 20 model city will built 400,000 charging pile and 28,000 charging station.

Second, the fiscal and taxation policy support. Through tax relief, infrastructure construction incentives, research and development incentives, further strengthening the application of new energy vehicles. Moreover, each new energy car’s subsidies are ranging from 3,000 yuan to 60,000 yuan.

Third, research investment and talented strategy. Highlight on key parts of technology, vehicle integration technology plat form public technology. Particularly with regard to electric vehicle research and development policy, by 2014, China’s investment in research and development has reached more than 2 billion.

4.3 Technical factors

Technical factors play a decisive role in the spread and promotion process of new energy vehicles. As a new industry, new energy vehicles in the field of technology have many shortcomings, requests more research and innovation. China in the field of technology has made a series of breakthroughs, in terms of key parts, power battery technology, motor driver technology, automotive fuel cell technology, electric accessories, in terms of the vehicle, pure electric vehicle technology, plug-in hybrid electric vehicles, and fuel cell vehicles. These technological breakthroughs and innovation, support and promote the development and popularization of new energy vehicles, also promote the adjustment of energy structure of China.

5. Problems and Suggestions of New Energy Vehicles

5.1 Problems of new energy vehicles

New energy automobile industry in the process of rapid development has also exposed many problems, such as: infrastructure is imperfect, lack of charging places; difficult to leasing; automotive finance market development is slow. The impact of these issues on marketing and further research and development must be solved. The main problems are:

First, due to the tendency of policies, new energy vehicles in China is currently mainly used in public transport, leasing, sanitation, rent, postal services, logistics, and other public places, particularly large new energy bus sales. In private consumption promote starts late, slow, poor battery life, charging hard, and fewer choices, higher cost is a key factor holding back new energy vehicles for people to buy [3].

Second, difficulties in charging. The speed of charging infrastructure construction is seriously behind with the promotion of new energy vehicle, especially for private consumption. In addition, lack of a clear national standards, charging pile firms and new energy automobile enterprises
perform their own corporate standards, leads to disunity charging interface, can not charging phenomena, adds difficulty to the charging problem.

Third, while the States issued several policy documents clearly requested not to sets the threshold of field new energy vehicles, but some local governments tend to promote local products. Local protectionism has severely hampered market economy, but also hindered the pace of innovation, slowing down the development process as a whole, restricting the overall progress of popularization of new energy vehicles.

Fourth, a typical technical problem is battery life, for many consumers, driving distantly is a problem. Compared with the traditional fuel vehicles, mileage short has severely restricted the popularization of new energy vehicles. In addition, electric vehicle has some problems such as battery capacity deficiency, mileage “inflated”, leakage, can not charging, and so on. In case of charging hard, battery life is particularly valued by consumers, so it is necessary to technically solve these problems.

5.2 Suggestions for the development of new energy vehicles

In response to these major challenges to the development of new energy vehicles, from management and policies put forward a number of improvement measures for the further development of new energy vehicles.

First, improve management level, and further improve the product access and exit system, building the product type approval system, and the production consistency verification system. Encouraging genuinely competitive businesses to enter new energy automobile industry, enhance the competitiveness of their products, and promote the healthy development of the industry [4].

Second, current promotion policy is dominated by subsidies, and subsidies lack of differentiation motivation for excellent products, resulting in companies lack of motivation. It is not conducive to the development of enterprises and the upgrading of product quality. Need to introduce the market mechanism, and gradually optimize marketing policies, reduce financial aid to encourage innovation. To build a new energy vehicle as an integral system, encourage enterprises to actively develop new energy vehicles, and enhance endogenous impetus of development to create a policy environment for sustainable development.

Third, beating local protection resolutely and the Central Government should according to the severity of protection, reduce province’s awards and subsidies. In upgrading new energy products convenience aspects, innovating new energy car traffic management mode, through classification registration, upgrade user in parking spaces distribution, high-speed charges, limited purchased, limited line, license plate, purchasing and using link of integrated experience. In addition, speeding up Infrastructure construction, and creating a good using environment for consumer.

Fourth, strengthening the support of technology innovation. China’s research and development support is still relatively weak and fragmented, resulting in key parts and whole vehicle technology is still a certain gap with foreign countries, products lack of competitiveness [5]. It is better for government to increase its support for technology enterprises, guide enterprises to focus on technical upgrading and improving the funding system, set up a special investment fund to attract the participation of large enterprises, financial institutions and social capital. Enlarge investment in innovative products and key technologies of key enterprises, solving technical problems, improve product competitiveness.

Acknowledgment

This research was financially supported by National Social Science Foundation: Research on the path and mechanism of the industrialization of cultural resources (NO.14BJY007).

Reference


