China’s Participation is an Upturning for the Battery Electric Vehicles’ Development

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ABSTRACT

Development and use of battery electric vehicles and light trucks will yield remarkable benefits environmentally and economically to nations by reducing reliance on importing petroleum, urban air pollution, and greenhouse gas emissions. Battery electric vehicles industry could revolutionize energy and transportation markets, increase their worth by more than $1 trillion US dollars annually in the next 20-25 years. Battery electric vehicles strategy is vital to every long-sighted country in the long run, both in sustainable development and industrial restructuring. Meanwhile, given the superiority in advanced material science, Internet technology, and strong governmental executive ability, China’s participation is an upturning for the development of battery electric vehicles.\(^1\)

KEYWORDS

Battery electric vehicle; Sustainable development; Auto industry

INTRODUCTION

Transportation has played a significant role in the fastest-growing volume of the world’s greenhouse gas (GHG) emissions, with cars contributing 8.7% of global energy-related carbon dioxide emissions in 2013. Besides, the car sales is predicted to double by 2050\(^1\)\(^,\)\(^2\)\(^,\)\(^3\). Every long-sighted country is vigorously trying to find renewable energy replacing traditional fossil fuels. Meanwhile, sustainable

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development of energy has become a pressing eternal issue in World Energy Congress. Under the pressure of energy and environment, the traditional Auto industry is facing increasingly strict emission standards. In 2017, UK and France announced that the sale for regular internal combustion engine vehicle would be ceased by 2040. Holland, Norway and Germany made the similar statement coincidentally of forbidding merchandising diesel engines from 2025 to 2030. Only the new energy vehicle with nearly zero-carbon emission and light trucks will be supplied after the ban. There is no doubt that these strategies will make more room for the progress of battery electric vehicles (BEV) due to its petrol-free character, high environmental affinity and alternative-fuel fungibility. Considering the potential mass market worldwide, the development of BEV industry must be an inevitable result of Auto industry evolution. Meanwhile, as nuclear electricity, hydro electricity, wind power, and solar power are the main energy resources in most western countries, this would considerably reduce the dependence on petroleum. In China, on the contrary, coal is the most used energy and almost 67% of electricity is produced by coal combustion. So for China, advancing national new-energy automobile industry is a promising way of cutting the national dependence on oil, leading resources pattern to energy diversification and guiding the structural reform of energy distribution from a industry-oriented situation to a green-energy-oriented future.

![Figure 1. The oil price in the past two decades.](image)

Recent scientific studies have indicated that the cost of hydrogen fuels is reasonable (less than $0.04/km in 34 km/L gasoline equivalent vehicles; $0.06/mile in 80 mpg) from using off-peak electricity or natural gas to either produce hydrogen on site at fueling stations, or delivering liquid hydrogen (LH2) by truck from larger, centralized plants. With the expansion of nanotechnology and material science like metal-organic frameworks (MOF material) and carbon fibers, systems storing high-pressure (34.4 MPa; 5000 psia) hydrogen gas in composite vessels into...
fuel cell vehicles can weigh less than the equivalent-range of full gasoline tank in an internal combustion engine vehicle at room temperature. Consequently, all these technical assistants make battery electric vehicles (BEVs) emerge as a viable technology in the market.

Hence, for China, the strategy of new energy vehicles development is not only the environmental protection duty for a responsible power, but also a golden opportunity to enhance the competitiveness of our Auto industry in the already crowded Auto market. China’s participation is definitely an upturning for the battery electric vehicles’ development. Notably, three congenital advantages of China will make BEV flourishing rapidly.

PREVIOUS INVESTMENT IN SCIENCE TECHNOLOGY MAKE CHINA OUTSTANDING IN MATERIAL SCIENCE AND NANOTECHNOLOGY

The key to BEV is the fuel storage, fuel releasing kinetic, and fuel efficiency. With the previous sufficient investment in science and technology, especially the monopolistic advantage in rare earth materials, more Chinese scientific achievements in BEV are dominant throughout the world than other traditional fields.

EXTRAORDINARY INTERNET TECHNOLOGY MAKES THE BEV MORE CONVENIENT AND ACCEPTABLE

With the prevalence of sharing technique, Chinese people have developed the habit of searching something on Internet. So it would be much more easier for the further utilization of unmanned remote changing pile on the road. In addition, the rise of Alipay scan or Wechat scan have made the identification of personal information so simple that consumers could easily pay the recharging commission fee on their own smart phones. Thirdly, wireless charge and quick charge is getting increasingly popular in almost every city in China. It is likely that people would fill up the battery when they were parking or having a lunch in the near future.

THE STRENGTH OF GOVERNMENT IS THE FOUNDATION FOR NEW ENERGY INDUSTRIAL CHAIN SYNERGIES

As a well-known infrastructure fanatic, Chinese government is equipped with the industrial chain synergies, which means they could concentrate on the modernization of new-energy industry by constructing factories in centralized electricity plants, so the integrated control are convenient for further pollution control and maintenance. For the weak foundation of traditional Auto industry markets, Chinese government would try their best to clutch at straws for further
manufacturing industry. At the same time, rare earth reservation is one of the most important factors for BEV’s development.

CONCLUSIONS

The strategy of Battery electric vehicles development is not only an environmental protection duty for a responsible power, but also a golden opportunity to enhance the competitiveness of Auto industry for every long-sighted country. Meanwhile, China plays and will play an important part in the booming BEV industry due to its own advantages.

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