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# Research on the application of new energy in vehicle engineering in china

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**Abstract.** Since the 21st century, the global car ownership has shown a trend of rapid growth. At the same time, the environmental pollution brought by it is also deeply affecting the people of the world. In addition, the shortage of fossil energy makes the fragile ecology worse. At present, ecological issues have become a global hotspot, and people's voice for environmental pollution control is also growing. In this context, energy saving, emission reduction, and environmental-friendly new energy vehicles have also become one of the current development directions. This paper focuses on introducing new energy vehicles and focuses on the application of new energy in vehicle engineering, so as to push energy conservation and emission reduction and environmental governance to a new height. This paper adopts the methodology of analysis of documents. This paper finds that new energy vehicles are one of the development directions of the automobile industry in the future. Researchers in this field should vigorously develop the infrastructure construction of new energy, constantly break through technological bottlenecks, and promote the widespread use of new energy in society and the market.

**Keywords:** new energy, vehicle engineering, conserving energy, reducing emissions, environmental governance.

## 1. Introduction

At present, environmental pollution is not only a thorny problem in China but also has become a common research topic for environmentalists from all countries in the international community. Among the various indicators of environmental pollution, the environmental pollution index is the most important and has the greatest impact on people's lives. At present, there are two main sources of air pollution in various countries[1]. One is industrial pollution, that is, highly polluting gases from various factories, and the other is automobile exhaust pollution, which is also one of the most important sources of pollution. With the increasing number of various motor vehicles, the impact of vehicle exhaust is also growing. Therefore, the future direction of automobile development should be to reduce the pollution of automobile exhaust to the environment and reduce energy consumption. This paper intends to analyze through literature review the status quo of the application of new energy in vehicle engineering in China and offers related suggestions for future development based on the status quo in China. This paper has played a very good role in popularizing the public's understanding of China's new energy vehicles.

## 2. Analysis of the prospect of new energy and new energy vehicles

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New energy means a new kind of energy with less pollution than traditional energy, including Solar energy, geothermal energy, wind energy, ocean energy, biomass energy, nuclear fusion energy, etc. At present, it is not widely applied in the international community. In practical application, it is still dominated by traditional petrochemical energy. At present, the bulk trading of the energy industry is dominated by coal resources, oil resources and natural gas. The common point of these traditional energy sources is that they are non-renewable, and they are one-time energy sources, In addition, the air pollution caused by insufficient combustion in the production and application process is also one of the important sources of air pollution.

Although its production scale and application reach are not as broad as those of traditional energy, new energy can lessen harm to the environment and ecology[2]. Future social progress will undoubtedly be aided by new energy as a result of the ongoing advancements in science and technology and the ongoing depletion of the world's non-renewable energy resources. The use of solar, geothermal, ocean, and wind energy is currently developing. They can be employed in the power system of a vehicle's engineering, replacing conventional fossil fuels like oil and natural gas to become one of the new generations of automotive energy in the future, in addition to fulfilling the most fundamental power generating needs.

At present, the most widely used new energy power vehicles are solar electric vehicles powered by solar energy. This kind of solar electric vehicles can, to a certain extent, compete with traditional cars, can be used as a means of transportation in the city, and can meet the travel needs of most people. The wide application of solar cars is the first step in the application of new energy in the automotive field. Although the technology of such cars is not yet mature and cannot compete with the traditional cars powered by fossil fuels in many aspects, this new energy car can effectively reduce the pollution of motor vehicle exhaust and greatly protect the ecological environment. In addition, people are buying more of these low-pollution vehicles as a result of national policies' encouragement and support, which has also encouraged the growth of an entirely new energy sector and decreased people's reliance on conventional energy sources. The creation and use of new energy have set the way for future energy development while simultaneously achieving sustainable development by addressing social development demands[3].

## 3. Application of new energy in new energy vehicles

### *3.1. Hybrid vehicles*

Hybrid electric vehicle, that is, the vehicle that uses oil and electricity as its driving power, uses traditional petroleum and its by-products as its driving power, and at the same time uses natural gas, ethanol, propane and other fuels as a part of the energy to transform the engine accordingly, so that these hybrid energies can jointly drive the motor to run and form a hybrid power. At present, the market share of this hybrid type of electric vehicle is low, but because this vehicle is the transition between traditional fossil energy vehicles and new energy vehicles and has the advantages of energy saving and low pollution, it is gradually accepted by people. At present, all countries in the world have begun to carry out environmental remediation, strictly control the vehicle exhaust emissions and power consumption, and with the constant fluctuation of oil prices in the international community, this oil-gas hybrid vehicle has begun to take shape. It is believed that in the near future, this kind of vehicle will also become the main force in the automotive market[4].

### *3.2. Electric vehicle*

As the name implies, purely electric vehicles are all powered by electricity. This kind of vehicle with electricity as its main driving force has no exhaust pollution because this kind of vehicle does not emit exhaust.

At present, this new energy vehicle has not been promoted on a large scale.

First, the technology is not mature enough. Second, the survival of the traditional automobile industry should also be taken into account. However, this kind of vehicle, which is mainly driven by electricity,

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is one of the most effective ways to solve automobile exhaust pollution. This kind of car takes electric power as the main driving force and does not consider pollution at all. Moreover, because the power system is electric power, it is very convenient to supplement energy[5].

In addition, the current application technology for electric power is very mature, so there is very little waste in this process. The research shows that the utilization rate of fossil energy is much lower than that of various new energy sources, such as wind energy, geothermal energy, tidal energy, and even thermal power generation, from the refining and processing of crude oil to finished products and finally being burned into automobile power. At present, for pure electric vehicles, the biggest problem is still the technical threshold and infrastructure. Traditional fossil energy vehicles have been very mature, and various related research and supporting facilities have also been very complete. But electric vehicles, need more basic supporting facilities, which not one or several enterprises can complete, but requires the joint efforts of the whole society, At the same time, the immaturity of technology is also one of the main reasons why people do not trust this electric vehicle.

### *3.3. Gas vehicles*

The main fuel of gas vehicles is natural gas, also known as natural gas vehicles, which are mainly divided into compressed natural gas vehicles and liquefied petroleum gas vehicles. Because the fuels of these two vehicles have been purified, they will be more sufficient than traditional gasoline and diesel when burning and will also cause less pollution to the environment[6].

According to research, the carbon monoxide emissions of gas vehicles are one-tenth of those of traditional gasoline vehicles, the hydrocarbon emissions are one-third, and the nitrogen and oxygen emissions are two-thirds, greatly reducing the air pollution caused by vehicle exhaust, It is a very practical low emission vehicle. Because the main component of natural gas is methane, which is not toxic or carcinogenic, and the products after full combustion are only carbon dioxide and water, this energy is also known as "clean energy". At present, gas vehicles have been widely promoted around the world, and many countries have taken the promotion of natural gas as one of the important means of pollution control.

### *3.4. Fuel cell vehicles*

In essence, both fuel cell vehicles and pure electric vehicles use electricity as their main driving force. The difference is that pure electric vehicles store electricity, while fuel cell vehicles store fuel that can be transferred to electricity[7].

This fuel is generally hydrogen oxygen mixed fuel, which produces some oxidation and reduction reactions when the vehicle starts, some electrical energy generated in these chemical reactions drives the motor of the car to rotate, thus driving the car forward. At present, this kind of fuel cell vehicle is still an ideal model, which has not been applied to the market on a large scale, mainly because the technology is not mature enough. This kind of fuel vehicle will not produce harmful substances during operation, and the energy conversion efficiency is more than twice that of the internal combustion engine. Therefore, it has a very broad development prospect in environmental protection and energy utilization.

## 4. Application and improvement suggestions for new energy and new energy vehicles

### *4.1. The strengthening of the cooperation between industry, university and research and break through the technical bottleneck*

In the application of new energy vehicles, the difficulty in breaking through the technical bottleneck has always been one of the hard wounds of the current new energy industry. In order to promote the application effect of new energy in vehicle engineering in China, and strengthen the cooperation between industry, university and research, it is very necessary to drive innovation with interests. In terms of innovation of new energy vehicles, we should actively promote cooperation between enterprises and local universities and research institutes. At the same time, we should also introduce foreign advanced technologies, learn from their development experience, innovate boldly, and truly put the trinity of

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production, teaching and research into place. Only then can we truly guarantee the future development of new energy[8].

### *4.2. Tripartite cooperation to strengthen infrastructure*

Because the traditional fossil energy has gone through the joint research and development of several generations, various technologies have been matured, and relevant facilities have been completed, the new energy is at a disadvantage compared with the traditional energy in terms of market competitiveness, so it is also very necessary to strengthen the infrastructure of new energy. Strengthen the cooperation among the government, the society and the market. The government should guide the development of new energy vehicle infrastructure by introducing funds, technology and talents. Society and the market will be encouraged to make rational allocations of resources, concentrate the market's superior resources, and coordinate comprehensively to provide sufficient support for infrastructure construction.

### *4.3. The strengthening of personnel training of vehicle engineering related majors*

At this stage, students majoring in vehicle engineering are facing increasingly fierce employment competition, and colleges and universities also need to face more severe tests. Under such a development situation, colleges and universities should further strengthen the analysis of the market situation and scientifically plan the employment development path of students, so as to effectively enhance their comprehensive competitiveness[9].

First of all, colleges and universities should fully recognize the development trend of new energy vehicles in the current market and combine this trend to reform and innovate the teaching plan, so as to ensure that they can highlight more competitive advantages in the new energy vehicle market, and also strengthen students' understanding of new energy vehicles, laying a solid foundation for their smooth employment and comprehensive development.

Secondly, colleges and universities should timely adjust the development plan of students, and further strengthen the teaching and training of new energy and other knowledge to meet the needs of society for talents.

Finally, the university can also establish a distinctive new energy major in combination with the market trend in the development process, which can not only reflect its own advantages in the competition of universities but also help the university to establish a good social image. In addition, the school can also establish a corresponding talent training system based on the development of new energy vehicles, so as to cultivate more professional high-quality talents needed for social development.

### *4.4. The strengthening of education*

In order to further improve the application level of new energy electric vehicles, education and publicity on relevant technologies should be strengthened to ensure that more people can recognize and affirm new energy vehicles.

Enterprises can publicize the use characteristics and development value of new energy electric vehicles through various new media and network means, thereby helping consumers to recognize the outstanding advantages of new energy vehicles and establish a good concept of environmental protection, which is reflected in consumers' market purchasing power for new energy vehicles.

At the same time, we can further guide more professional and technical personnel to participate in the research and development of new energy vehicles through education and publicity activities, so as to realize the opening and expansion of new energy vehicle products in the market. It is worth noting that in the process of actually carrying out the innovation and research and development of new energy vehicle products, enterprises can establish a certain exchange and cooperation mechanism with colleges and universities, effectively realize the application and implementation of science and technology and practical experience with the help of special docking mode, so as to develop new energy vehicle products with higher quality.

Through this cooperation mode, on the one hand, we can accelerate the full use of new energy vehicles and promote the modernization of China; On the other hand, it can also provide more talent

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support and technical support for the research and development of new energy vehicles, laying the foundation for the sustainable development of China's new energy industry.

## 5. Conclusion

This paper focuses on introducing new energy vehicles and focuses on the application of new energy in vehicle engineering, so as to push energy conservation and emission reduction and environmental governance to a new height. The introduction of new energy technology in vehicle engineering has played a key role in improving economic efficiency, improving resource utilization efficiency and reducing the environmental pollution. Therefore, the promotion and application of new energy vehicles also have practical significance that cannot be ignored.

New energy vehicles are one of the development directions of the automobile industry in the future. Although the application and promotion of such vehicles are not strong enough at present, with the continuous reduction of fossil energy and other disposable fuels and the continuous deterioration of the world environment, new energy will replace fossil energy as the driving force of human society in the future, which is a long and complex process. During this period, researchers should vigorously develop the infrastructure construction of new energy, constantly breakthrough technological bottlenecks, and promote the widespread use of new energy in society and the market. The paper has its limitations, lacking the analysis of new energy vehicle users and specified ways to promote new energy to the general public, which could be the direction for future studies.

## References

[1] Xiao Pan, Wang Haobo, “Application of solar energy technology in new energy industry of automobile”, Computer Nik, no.3 (2017):25-26.

[2] Xu Wenbo, Chang Cheng, “Teaching Research on New Energy Vehicle Technology Course for Vehicle Engineering Major of Applied Undergraduate”, Hebei Agricultural Machinery, no.10 (2020):33-34.

[3] Wu Jing, Xu You, Du Canyi, Fu Ninglu, Chen Xiao, “Research on Applied Practical Teaching Method for Vehicle Engineering Undergraduates Based on New Energy Vehicle”, Scientific and Technological Wave, no.19 (2019):70-72

[4] Fu Chuqing, Fu Xianfeng, Yan Ningning, Zheng Runnv, “Application of Virtual Simulation Software in Experimental Teaching of New Energy Vehicle Engineering Specialty in Colleges and Universities”, Internal combustion engine and accessories, no.1(2020):263-264

[5] Jin Lina, “Research on the Application of New Energy in Vehicle Engineering”, Agricultural Machinery of the Times, no.3 (2020) :64-67

[6] Qian Gongxuan, “Application of new energy in vehicle engineering”, China Equipment Engineering, no.24 (2019):213-214

[7] Gu Lianxi, “Construction and thinking of new energy vehicle direction for vehicle engineering specialty”, Reading and Writing (Journal of Education and Teaching), no.11(2019):63

[8] Xu Yifan, “Construction and thinking of new energy vehicle direction for vehicle engineering in university”, Strategies in Agriculture, no.7(2018):226.

[9] Weng Huishan, “Application of New Energy in Vehicle Engineering”, Science and Technology Outlook, no.26 (2016):136