

朱大碌：与 AI 关于新能源汽车的对话

Zhu Dalu: A Dialogue with AI on New Energy Vehicles

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This translation is part of a series where articles on Artificial Intelligence in China shall be translated from Chinese to English. This limited series on AI will be translated by Saranya. The first issue on AI in China, *ICS Translations* Issue No. 47, can be accessed [here](#).

A Milestone

It is a matter of great pleasure to announce the 50th publication in the *ICS Translations* series. This series was started in 2020 with the aim of bringing current and scholarly debates in China to the attention of the non-Chinese knowing audiences in India. An important component of the ICS' mission is to inform public discourse and provide expert inputs. In our collective pursuit of understanding China. It is important to comprehend how the Chinese look at and interpret various issues — political, economic, social and cultural — and what are the kind of themes that concern the public at large. Through this series, the ICS has endeavoured to bring the latest and most influential debates in China to the fore. Our team of highly motivated young scholars has worked hard over the years to ensure translations of high quality, and it is our goal to continue with this endeavour. The ICS has played a stellar role in providing a platform for the propagation of these translations and thereby the promotion of China studies in India.

Prof. Alka Acharya
Honorary Director, Institute of Chinese Studies, New Delhi



An AI avatar stands next to an electric vehicle

Note

This article is a transcript of the discussion between an artificial intelligence (AI) chatbot and Zhu Dalu on new energy vehicles, followed by his brief comments on AI's responses. Zhu Dalu is a Chinese writer and economist who has authored over 180 articles on economics and politics in various Chinese publications. The "AI" in this article refers to Ernie Bot 文心一言, a generative AI chatbot service product of Baidu, release in 2023.

Q 1: What are the characteristics of new energy? Can rechargeable batteries be considered new energy?

AI: Following are the main characteristics of new energy:

1. **Abundance:** New energy is generally renewable and sustainable.

2. **Low Energy Density:** The energy density of new energy is relatively low; hence, its development and utilisation require larger area/space.
3. **Low-carbon and Environment-friendly:** **new energy has a low or zero-carbon footprint** and has minimal impact on the environment. It contributes to reducing greenhouse gas emissions and mitigating climate change.
4. **Widespread Distribution:** New energy sources are widely distributed, making them suitable for small-scale decentralised use.
5. **Intermittent Supply:** The supply of new energy is intermittent and volatile, which makes continuous power supply challenging.
6. **Higher Costs:** Except for hydropower, the development and utilisation costs of renewable energy are higher than fossil fuels.

As for whether rechargeable batteries can be considered new energy, the answer is no. Rechargeable batteries are not a source of new energy, but an energy storage device. Batteries store energy in various forms, such as chemical energy and electrical energy, and then convert it into

electrical energy to power any electrical equipment. Batteries play a crucial role in NEVs by storing electrical energy and providing power to motors. However, they do not inherently possess the characteristics of a new energy source, such as renewability and direct energy generation. Therefore, rechargeable batteries cannot be classified as a new energy source.

Q2: If rechargeable batteries are not a new energy source, can battery-powered vehicles be called NEVs? Is there really anything called NEVs?

AI: Battery-powered vehicles can be called NEVs. The term “new energy vehicle” refers to automobiles that use unconventional fuels for propulsion (or use conventional fuels but new on-board power systems), incorporate advanced power control and driving technologies for power control and drive, resulting in vehicles with cutting-edge principles, new technologies, and innovative structures. Examples of NEVs include but are not limited to pure electric vehicles (EVs), extended-range EVs, hybrid vehicles, fuel cell EVs, hydrogen fuel cell vehicles, etc. There are indeed true NEVs. While the definition of NEVs is not limited to battery vehicles, battery vehicles (especially pure

EVs) constitute a significant portion of NEVs. According to the statistics in reference article 2, the production and sales of NEVs continue to grow, demonstrating the vitality and potential of this market.

More specifically, what is “new”_in NEV is primarily reflected in the following aspects:

1. **Power Source:** NEVs use unconventional automotive fuels like electricity or hydrogen instead of conventional fuels like gasoline or diesel.
2. **Technological Principles:** NEVs use advanced technologies in power control and driving, which leads to higher energy conversion efficiency and lower emissions.
3. **Eco-friendliness:** Since NEVs use clean energy and advanced emission control technology, these vehicles cause less environmental pollution.

The rapid development of NEVs has received strong government support and wide market recognition. Technological advancements and policy support together will lead to globally wider adoption of NEVs in the coming days.

Q3: Self-generated waste and waste management are two distinct concepts and should not be conflated. Are battery-powered cars the largest producers of hazardous waste in history?

AI: This question requires a logical analysis of environmental protection and waste management. We need to first clearly define the core concepts before inferring them to arrive at a conclusion.

Analysis of Core Concepts:

1. **Waste Generation vs. Waste Management:** These are two different processes; one is the generation of waste and the other is the handling or disposal of waste.
2. **Battery-Powered Cars:** This refers to electric vehicles i.e. automobiles powered by electricity and equipped with battery storage systems.
3. **Red Hazardous Waste:** This term generally refers to waste that poses significant environmental risks and requires special handling to prevent pollution.

Now, let's further discuss these core concepts:

1. **Self-generated Waste and Battery-powered Vehicles:**

Battery-powered vehicles do indeed produce waste during their operational lifespan, including items like used batteries and tyres. However, the nature and handling of such waste are different from the waste produced by conventional fossil-fuel-powered vehicles, such as waste oil and exhaust gas.

2. **Waste Management and EVs:**

The waste from EVs, especially used batteries, requires special recycling and handling techniques to safeguard against environmental pollution. But this also shows that we are making efforts to find solutions for managing this waste, rather than merely creating problems.

3. **Largest Producer of Hazardous Waste:**

Labelling electric vehicles as “the largest producer of red hazardous waste in history” is an overstatement. EV adoption rates are far behind those of conventional fossil-fuel-powered vehicles. Moreover, the type and quantity of waste generated by EVs depend on various factors such as

the type of battery and lifespan of a vehicle.

In conclusion, even though EVs generate waste that requires special handling during their operational lifespan, labelling them “the largest producers of hazardous waste in history is oversimplified, biased, and does not give the complete picture. A comprehensive assessment of the impact of EVs requires a holistic evaluation of various factors such as environmental benefits, development of waste management technology, and comparative advantages over conventional fossil-fuel-powered vehicles.

Q4: There are two types of true NEVs – smart EVs compatible with wireless electric roads and vehicles using renewable energy like biogas, hydrogen, etc. Can these NEVs using clean and renewable energy replace fossil-fuel-powered vehicles and highly polluting rechargeable battery-powered vehicles?

AI: Here is my analysis of whether electric road-compatible smart EVs or vehicles using renewable energy such as biogas and hydrogen can replace fossil-fuel-powered vehicles and highly polluting rechargeable battery-powered vehicles:

1. Electric Road-compatible Smart EVs:

- i. Advantages: These vehicles play an important role in the renewable new energy system. They use electricity as their power source, thus significantly reducing tailpipe emissions. Moreover, the electric drive mode provides a better driving experience and better fuel economy.
- ii. Challenges: At present, however, the pseudo new energy rechargeable battery vehicles are still faced with technical and economic limitations, such as heavy battery, short battery life, long battery-charging time, and inadequate charging infrastructure. Moreover, the source of power for EVs that rely entirely on electricity raises another concern. Their eco-friendliness is questionable, especially when the electricity is supplied from thermal power plants.
- iii. Conclusion: As a type of new energy vehicle, electric road-compatible smart EVs have the potential to replace fossil-fuel vehicles and high-pollution rechargeable battery vehicles.

However, the new type NEVs still need breakthroughs in battery technology, battery charging facilities, and power generation resources.

2. Renewable Energy

(Biogas, Hydrogen) Powered NEVs:

- i. Advantages: Renewable energy sources such as biogas and hydrogen are clean, efficient, and safe. Vehicles powered by these fuels can significantly reduce tailpipe emissions and environmental pollution.
- ii. Challenges: However, such vehicles still face some technical bottlenecks and economic limitations. For example, technological advancements in hydrogen extraction, storage, and transportation as well as the swift development of hydrogen supply infrastructure are essential. Besides, higher prices and high maintenance cost of the NEVs are making these vehicles market unfriendly.
- iii. Conclusion: NEVs powered by renewable energy sources such as biogas and hydrogen offer

substantial environmental benefits but require breakthroughs in their technology and economy to gradually supplant fossil-fuel-powered vehicles and highly polluting rechargeable battery-powered vehicles.

To sum up, electric road-compatible smart EVs and vehicles powered by renewable energy, such as biogas and hydrogen have the potential to replace fossil-fuel-powered vehicles and highly polluting rechargeable battery-powered vehicles. However, breakthroughs and progress in several areas are necessary. As new energy technologies develop and mature, these two types of NEVs may supplant fossil-fuel-powered vehicles in future and become the choice of the mainstream.

Following is the summary of AI's responses to the above four questions:

In response to the first question, AI clearly states that rechargeable batteries are not a new energy source.

However, for the second question, AI affirms that cars using rechargeable batteries are indeed NEVs.

AI avoids directly answering the third question of whether “battery-powered

vehicles are the largest producers of hazardous waste in history” by providing a vague response.

As for the fourth question, the AI surprisingly states that “the pseudo-NEVs with rechargeable batteries currently available still have shortcomings in terms of technology and economy.” This statement is diametrically opposite to its earlier response asserting that battery-powered vehicles are indeed NEVs. Furthermore, AI agrees that electric road-compatible smart EVs and vehicles powered by renewable energy, such as biogas and hydrogen, have the potential to replace fossil-fuel-powered vehicles and highly polluting rechargeable battery-powered vehicles. These two types of NEVs may supplant fossil-fuel-powered vehicles to become the mainstream choice.

This shows that AI is not infallible. However, AI has the remarkable ability to rectify itself, unlike some people who refuse to acknowledge their mistakes and make amends due to their self-interests, positions, or pride.

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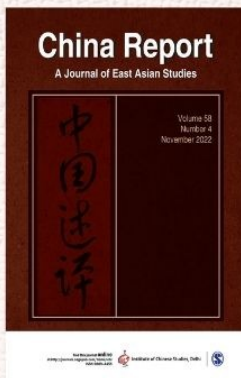


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