# IEA-Advanced Motor Fuels ANNUAL REPORT 2022

## China

Technology Collaboration Programme
by IEA

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## *Drivers and Policies*

China is making efforts to achieve peak carbon dioxide emissions and carbon neutrality targets before 2030, and carbon neutrality before 2060. China will promote the goals of new energy and clean energy development, actively developing solar energy resources, hydrogen energy resources, and other renewable energy resources. In addition, it would escalate the development of new energy resources, such as wind, solar, biomass, geothermal, ocean, and hydrogen energy.

### Opinions on Optimization of Energy Green Low Carbon Transformation System, Mechanism and Policy Measures

In February, the National Development and Reform Commission and National Energy Administration issued "Opinions on Optimization of Energy Green Low Carbon Transformation System, Mechanism and Policy Measures." It discusses optimizing the energy clean substitution program in the transport field, driving the transformation of green low carbon in transport, optimizing the transport structure and introducing green low carbon transport facilities and equipment. China proposes to promote large-capacity electric public transport and vehicles using clean energies such as electricity, hydrogen, advanced biological liquid fuel, and natural gas. It intends to optimize layout and service facilities such as charging/battery swap, hydrogen filling, and gas filling (LNG) stations while reducing the cost of clean energy consumption in the transport field. China expects to carry out the construction of multi-energy fusion transport energy supply yard/stations, promote pilot demonstrations for energy interactions between the new energy vehicle and the power grid, and explore the collaborative development of vehicle/pillar and boat/shore.

### Implementation Plan of Carbon Dioxide Emission Peaking in Industrial Field

In August, the Minisry of Industry and Information Technology, National Development and Reform Commission and the Ministry of Ecology and Environment jointly published and distributed the "Implementation Plan of Carbon Dioxide Emission Peaking in Industrial Field." This plan proposes to promote energy-saving and new energy vehicles; enhancing the development of such vehicles operating as urban buses, taxis, postal service and express delivery vehicles, environmental sanitation, and urban logistic distribution; and increase the proportion of private new energy vehicles. The plan intends to carry out research, development, and demonstration applications of electric heavy-duty trucks and hydrogen fuel vehicles. It will speed up the construction of charging pillars and innovations in the battery swap mode, and establish a convenient and efficient battery charging network system ahead of schedule. Using international standards as a benchmark, China will formulate and revise its standards on the energy saving and emission reduction of motor vehicles. In 2030, the proportion of new energy vehicles and clean energy vehicles newly added should reach approximately 40%, and the carbon dioxide emission intensity of new passenger cars and commercial vehicles should be reduced by more than 25% and 20%, respectively, compared to 2020 levels.

### Existing National Standards on Alternative Motor Fuels

- GB/T 23510-2009, "Fuel methanol for motor vehicles," was released on April 8, 2009, and implemented on November 1, 2009.
- GB/T 23799-2021, "Methanol gasoline (M85)," for motor vehicles was released on October 11, 2021, and will be implemented on May 1, 2022.
- GB/T 34548-2017, "The additive of methanol gasoline for vehicles," was released on October 14, 2017, and implemented on May 1, 2018.
- GB/T 31776-2015, "Determination method of methanol content in methanol gasoline for motor vehicles," was released on July 3, 2015, and implemented on October 1, 2015.
- GB/T 26127-2010, "Compressed coalbed methane as vehicle fuel," was released on January 14, 2011, and implemented on June 1, 2011.
- GB/T 26605-2011, "Dimethyl ether for motor vehicle fuel," was released on June 16, 2011, and implemented on November 1, 2011.
- GB 19159-2012, "Automotive liquefied petroleum gases," was released on November 5, 2012, and implemented on April 1, 2013.
- GB 25199-2017, "B5 diesel fuels," was released and implemented on September 7, 2017.
- GB 18351-2017, "Ethanol gasoline for motor vehicles (E10)," was released and implemented on September 7, 2017.

- GB/T 22030-2017, "Blendstocks of ethanol gasoline for motor vehicles," was released and implemented on September 7, 2017.
- GB 35793-2018, "Ethanol gasoline for motor vehicles E85," was released on February 6, 2018, and implemented on September 1, 2018.
- GB 18047-2017, "Compressed natural gas as vehicle fuel," was released on September 7, 2017, and implemented on April 1, 2018.
- GB/T 40510-2021, "Bio-natural gas as vehicle fuel," was released on August 20, 2021, and will be implemented on March 1, 2022.
- GB/T 34537-2017, "Hydrogen and compressed natural gas (HCNG) blended as vehicle fuel," was released on October 14, 2017, and implemented on May 1, 2018.
- GB/T 37178-2018, "Coal-based synthetic natural gas for vehicle," was released on December 28, 2018, and implemented on July 1, 2019.
- GB/T 37244-2018, "Fuel specification for proton exchange membrane fuel cell vehicles – Hydrogen," was released on December 28, 2018, and implemented on July 1, 2019.
- GB/T 40045-2021, "Fuel specification for hydrogen powered vehicles – Liquid hydrogen ($LH_2$)," was released on April 30, 2021, and implemented on November 1, 2021.

## *Advanced Motor Fuels Statistics*

In 2022, the output of industrial –crude oil above designated size was 204.67 million tons in China, showing an increase of 2.9% year-on-year. Meanwhile, the country imported 508.28 million tons of crude oil, a decline of 0.9% year-on-year. A total of 675.90 million tons of crude oil were processed, representing a decline of 3.4% year-on-year. In 2022, China produced 217.8 billion cubic meters ($m^3$) of natural gas: an increase of 6.4% year-on-year. It imported 109.25 million tons of natural gas, representing a 9.9% decline year-on-year. By the end of 2022, the installed capacity of wind power and photovoltaic power generation in China exceeded 700 million kilowatts.

In 2022, China's auto production and sales volume were 27.021 million units and 26.864 million units, respectively, with a year-on-year increase of 3.4% for production and 2.1% for sales. The production and sales volume of new energy vehicles were 7.058 million units and 6.887 million units, showing a year-on-year increase of 96.9% and 93.4%, respectively, and accounting for 25.6% of market share. The production and sales volume of hydrogen fuel cell electric vehicles were more than 4,000 units produced and 5,000 units sold. The sales volume of natural gas heavy-duty vehicles was 37,300 units and the top five provinces by sales were Shanxi, Xinjiang, Hebei, Shaanxi, and Ningxia.

## *Research and Demonstration Focus*

### Promotion of Methanol Gasoline Vehicles Pilot Project

In 2019, the Ministry of Industry and Information Technology and other relevant ministries jointly issued the "Guiding Opinions on the Application of Methanol Vehicles in Some Areas," supporting areas (such as Shanxi, Shaanxi, Guizhou, and Gansu provinces) with resources and experiences in operating methanol vehicles, to accelerate the application of M100 methanol vehicles.

Shanxi Province has formed a green industrial chain system from methanol fuel production and supply to methanol vehicle production and application. Jinzhong, a city in Shanxi, is one of the earliest pilot cities in China to engage in the application of methanol fuel and methanol vehicles. After 30 years of development, Jinzhong has initially formed the industrial chain system of methanol production and development, equipment manufacturing, methanol transmission, and distribution. The promotion of methanol heavy trucks will help, the city to achieve low carbon emissions.

In August 2022, Jinzhong introduced an incentive policy for the promotion and use of methanol heavy trucks, providing a subsidy of RMB 30,000 Yuan per buyer. Jinzhong took the lead in incorporating methanol heavy trucks into "green card" management, and methanol heavy-duty trucks enjoy the same right of way as new energy vehicles. Jinzhong planned to build 16 methanol refueling stations by the end of 2022. In June 2022, Geely Jinzhong Base commenced production of methanol heavy trucks with an annual output of 10,000 units. In addition, more than 300 units of methanol heavy-duty trucks have

been put into operation in Shanxi, Shaanxi, Xinjiang, Gansu, and Guiyang. In December 2022, 500 methanol heavy-duty trucks were delivered in Jinzhong.

In March 2022, Guizhou issued several policies and measures for promoting methanol gasoline vehicles. The goal is that by the end of 2023, the population of methanol vehicles will reach 25,000, with 100 methanol refueling stations for vehicle use; by 2025, the population is expected to reach 50,000, with 200 refueling stations. By July 2022, Guizhou had promoted about 17,000 methanol gasoline vehicles and more than 60 methanol refueling stations. Guizhou encourages government agencies to buy methanol gasoline vehicles for government use and promotes the application in the public area of taxis and online hailing cars. Private customers are encouraged to buy and use methanol cars.

**Promotion of Hydrogen Fuel Cell Electric Vehicles Pilot Project**

In September 2020, the Ministry of Finance, Ministry of Industry and Information Technology, Ministry of Science and Technology, National Development and Reform Commission, and the National Energy Administration jointly issued the "Notice on Developing Demonstrative Application of Fuel Cell Vehicles," supporting the key technology breakthrough and application of hydrogen fuel cell electric vehicles. In September 2021, the first batch of three fuel cell vehicle demonstration city groups was announced; the three groups are led by Beijing, Shanghai, and Foshan of Guangdong Province.

In January 2022, the second batch of two fuel cell vehicle demonstration city groups was approved. They are as follows:

1. The Hebei city group led by Zhangjiakou, together with 13 cities or districts such as Tangshan, Baoding, Handan, and Qinhuangdao.
2. The Henan city group led by Zhengzhou, together with 11 cities or districts such as Xinxiang, Luoyang, Kaifeng, Anyang, Jiaozuo, three districts of Shanghai (Jiading, Lingang, and Fengxian), Zhangjiakou, Weifang, and Foshan.

At this point, China has five fuel cell electric vehicles demonstration city groups; during the next four years, about 33,000 units of fuel cell electric vehicles would be promoted. The vehicle models are mainly buses, heavy-duty trucks, and special vehicles.

## *Outlook*

China will consistently implement the strategy of carbon peaking and carbon neutrality, accelerate the green transition, and make contributions to combating global climate change.

New energy vehicles in China have entered a comprehensive market development stage. In the future, new energy vehicles will maintain a steady and positive development trend. The application scale of hydrogen fuel cell electric vehicles will grow fast. Natural gas vehicles and methanol gasoline vehicles will be encouraged where local resources are available; for example, Jinzhong in Shanxi Province will actively promote methanol-fueled heavy trucks and cars.

## *Additional Information Sources*

- National Development and Reform Commission, https://www.ndrc.gov.cn/fggz/jjyxtj/mdyqy/
- China Association of Automobile Manufacturers (CAAM), http://www.caam.org.cn/
- China Automotive Technology and Research Center (CATARC), http://www.catarc.ac.cn/ac_en/index.htm
- Methanol Institute, A Brief Review of Chinas Methanol Vehicle Pilot and Policy, https://www.methanol.org/methanol-news-en/
- Ministry of Industry and Information Technology (MIIT), http://www.miit.gov.cn/
- http://www.cvworld.cn/
- http://jzkfq.sxjz.gov.cn/