

IEA-Advanced Motor Fuels ANNUAL REPORT 2019

China



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Drivers and Policies

Technology Roadmap for Energy-Saving and New Energy Vehicles

The Chinese Society of Automotive Engineers released a “Technology Roadmap for Energy-Saving and New Energy Vehicles” for China in October 2016. This newest, comprehensive guideline indicates the direction of energy saving and new energy vehicles (NEVs) in the Chinese automotive industry until 2030. It also takes into account China’s “Made in China 2025” initiative, China’s policy for becoming a manufacturing powerhouse.

The energy-saving path of alternative fuel sharing will be executed in the field of commercial vehicles. The stable development of commercial vehicles using alternative fuels—mainly natural gas, supplemented by dimethyl ether, biofuel, and methanol/diesel—will be appropriately promoted. Demonstration operations and pilot applications will be conducted.

Expansion of Biofuel Ethanol Production and Promotion of Ethanol Gasoline for Vehicles

In addition to the focus on promoting the industrialization of pure electric and plug-in hybrid electric vehicles, China is expanding ethanol production and use. On September 13, 2017, China’s National Development and Reform Commission released a new policy paper on the expansion of biofuel ethanol production and the promotion of ethanol gasoline for vehicles in conjunction with 14 other government organizations, including the National Energy Administration and the Ministry of Finance.

The country aims to roll out the use of ethanol in gasoline nationwide by 2020, and by 2025, China will look to realize the large-scale production of cellulosic ethanol, which is made from plant fibers, making the nation a world leader in biological liquid fuel technology, equipment, and industry. The National Energy Administration gave no indication what level of ethanol would be required in ethanol gasoline, but it is expected to be 10%.

On August 22, 2018, Premier Li Keqiang proposed the overall layout of the biofuel ethanol industry at the State Council executive meeting: “insisting on volume cap control, limited producers, fair access, moderately deploying of grain-based fuel ethanol production; accelerating the construction of cassava fuel ethanol project, and carrying out the industrialization of fuel ethanol utilizing of cellulosic stalk and exhaust gas from steel industry.”

Guidance on the Application of Methanol Vehicles in Some Areas

On March 19, 2019, eight departments including the Ministry of Industry and Information Technology of the People's Republic of China issued guidance on the application of methanol vehicles in some regions. The relevant regions should actively create conditions for the application of methanol vehicles, and give preferential policies for the purchase and operation of methanol vehicles that meet the requirements of China's sixth-stage motor vehicle pollutant emission standards and methanol vehicle emission limits.

Policy support will also be offered to efforts to improve efficiency in producing methanol fuel and making equipment that absorbs carbon dioxide emissions. To promote the use of methanol-fueled cars, China will increase the number of methanol cars in places such as North China's Shanxi Province and Southwest China's Guizhou Province. The use of methanol cars for official trips, rental services and other areas will be encouraged.

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 23799-2009, "Methanol gasoline (M85) for motor vehicles" was released on May 18, 2009, and implemented on December 1, 2009.
- GB/T 26127-2010, "Compressed coalbed methane as vehicle fuel" was released on January 14, 2010, and implemented on December 1, 2009.
- 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/T 20828-2015, "Biodiesel blend stock (BD100) for diesel engine fuels" was released and implemented on May 8, 2015.
- 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 37178-2018, "Coal-based synthetic natural gas for vehicle" was released on December 28, 2018, and implemented on July 1, 2019.

Advanced Motor Fuels Statistics

In 2019, 191.12 million tons of crude oil were produced in China, an increase of 1% year-on-year. Meanwhile, 381.39 million tons of petroleum products were produced in China, an increase of 3.6% year-on-year. From January to December 2019, China consumed 329.61 million tons of petroleum products (including diesel and gasoline fuels), an increase of 1.4% year-on-year. Of this total, the consumption of gasoline fuels increased by 2.3%, and diesel fuels decreased by 0.5%. Fuel consumption by road transportation vehicles is the main source of total Chinese gasoline and diesel consumption.

Natural gas is another main energy source for vehicles in China. In 2019, China produced 177.7 billion cubic meters (m³) of natural gas, an increase of 11.5% year-on-year. Meanwhile, China imported 132.2 billion m³ of natural gas, an increase of 6.5% year-on-year. From January to December 2019, natural gas consumption reached 306.7 billion m³, an increase of 9.4% from 2018.

In 2019, China's auto production and sales were 25.7 million vehicles and 25.8 million vehicles, respectively, with a year-on-year decrease of 7.5% for production and 8.2% for sales.

In 2018, China had 0.53 million new CNG vehicles, while total ownership reached 6.26 million cars, an increase of 9.2% over 2018. In 2018, there were about 300 new CNG stations, and the total number of stations was 5,600, an increase of 5.7% over 2018. In 2018, more than 90,000 new LNG vehicles were produced, while total ownership reached 0.44 million cars, an increase of 25.7% over the previous year. The total number of LNG stations increased to about 3,400 in 2018.

Research and Demonstration Focus

Promotion of Methanol Gasoline Vehicles Pilot Project

At the end of February 2012, the Ministry of Industry and Information Technology announced the launch of three pilot projects involving methanol vehicles — one each in the Shanxi, Shanghai, and Shaanxi provinces. This indicated that methanol gasoline had entered a new era of development. By the end of 2013, 26 provinces had entered the field, to different degrees, where five provincial governments had organized and implemented the pilot projects.

Under the pilot program, 1,024 methanol fueled vehicles were placed into operation in Jinzhong, Changzhi, Xi'an, Baoji, Yulin, Hanzhong, Lanzhou, Pingliang, and Guiyang, including 904 Geely M100 methanol taxis, 100 M100 methanol buses of Zhengzhou Yutong Bus, five methanol/diesel dual fuel trucks from Shaanxi Heavy Auto Enterprise, and 15 M100 multi-function automobiles from Shaanxi Tongjia Automobile Co., Ltd.

Average vehicle running time is over two years, with the longest running time of three years. The total pilot mileage is over 184 million kilometers, with methanol fuel consumption over 24,000 metric tons. Thirty-two models of methanol vehicle were certified in the pilot. Some cities expanded their methanol vehicle operation fleets, and the total number of methanol vehicles being operated in China reached over 7,000 units in 2019.

In the pilot, health checks were conducted on 1,199 people from a variety of occupations with potential methanol exposure, including vehicle drivers, maintenance workers, fueling station staff, and operators in methanol fuel blending. No human health issues were observed.

Chinese original equipment manufacturers (OEMs) have produced a number of new light- and heavy-duty methanol vehicle models, with 32 models certified by MIIT for commercial sales. Leading the mass production of methanol vehicles, Geely Auto has established production facilities capable of producing 300,000 to 500,000 units of methanol engines and cars at manufacturing bases in China.

Promotion of Ethanol Gasoline Vehicles Pilot Project

China first developed an ethanol fuel industry 15 years ago, when ethanol was employed for the increased utilization of corn in the country. In 2004, 11 provinces used ethanol gasoline, making up one-fifth of the country's total gasoline consumption.

Until the end of 2019, ethanol gasoline was promoted in the Heilongjiang, Jilin, Liaoning, Henan, Anhui, Guangxi, Shangxi, Hebei and Tianjin provinces with a fully closed type. Hubei (nine cities), Shandong (eight cities), Jiangsu (five cities), Guangdong (one city) and Inner Mongolia (three cities) provinces promoted ethanol gasoline with a semi-closed type. Ethanol gasoline has not been rolled out as quickly as expected.

The promotion of ethanol gasoline for motor vehicles in Tianjin started before August 31, 2018. The closed operation in Tianjin was realized on September 30. Ordinary gasoline was basically replaced by ethanol gasoline in the entire city. Tianjin has 874 fuel stations in the city, with an annual

sales volume of about 2.5 million tons. According to the standard of adding ethanol, about 260,000 tons of fuel ethanol is needed every year. By the end of July 2019, a total of 1.6 billion liters of ethanol gasoline for vehicles were sold in Tianjin, with 52.5 million vehicles filled with ethanol gasoline.

Outlook

According to the study of the China Industrial Gases Industry Association, China will usher in the golden age of natural gas vehicle development over the next 10 years. According to the national plan, by 2020, China's natural gas (LNG and CNG) vehicle output could reach 1.2 million vehicles per year, including buses and trucks at 200,000 (LNG cars accounting for 50%) and passenger cars at 1 million (LNG cars accounting for about 20%). By 2020, the population of natural gas vehicles will reach 10.5 million, which means the position of natural gas as the number one alternative vehicle fuel will be unshakable.

Plans call for China to develop a demonstration facility by 2020 that can make 50,000 tons of ethanol a year from cellulose, according to the Cabinet's National Energy Administration. The administration said that would expand to commercial scale by 2025. Ethanol gasoline for motor vehicles (E10) will be used in almost 34 provinces of China by 2020.

Within five years, the fleet of M100 vehicles in China could reach 50,000 cars, trucks and buses, consuming more than 500,000 metric tons of methanol.

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 Society of Automotive Engineers (China-SAE), <http://www.sae-china.org/>
- China Automotive Technology and Research Center (CATARC), http://www.catarc.ac.cn/ac_en/index.htm
- Asia Pacific Natural Gas Vehicles Association (ANGVA), <http://www.angva.org/>
- 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/>