

China

Drivers and Policies

Development Plan for an Energy-Saving and Alternative-Energy Automotive Industry (2012–2020)

The automotive industry is a main industry in the Chinese economy and plays an important role in the country's economic and social development. Along with China's sustained, rapid economic development and accelerating urbanization, automotive demands continue to increase, and the resulting energy shortage and environmental pollution problems will become more prominent. Speeding up the cultivation and development of energy-saving and alternative-energy vehicles is urgently needed to effectively alleviate energy and environmental pressures and promote the sustainable development of the automobile industry. It is also needed as a strategic initiative to accelerate the transformation and upgrading of the automobile industry and to cultivate new economic growth and give China a competitive advantage internationally. China's plan is especially formulated to implement the decisions of the State Council to develop a strategic emerging industry and to strengthen energy savings and emission reductions, as well as to accelerate the cultivation and development of an energy-saving and alternative-energy automotive industry. The plan spans 2012–2020.

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 roadmap indicates the direction of energy saving and new energy vehicles (NEVs) in the Chinese automotive industry until 2030. This technology roadmap is the newest comprehensive guideline for energy-saving vehicles and NEVs and takes into account China's "Made in China 2025" initiative, its 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 the pure electric and plug-in hybrid electric vehicles, China is also 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 would be 10%.

The latest plan (2017) is intended in part to use up aging stockpiles of corn, which total 270 million tons. The scale of consumption of biofuel ethanol is growing rapidly worldwide, increasing from 36.28 million tons in 2005 to 79.15 million tons last year. China ranks third globally, with only 2.6 million tons consumed per year.

On August 22, 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.”

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 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 2018, 189.28 million tons of crude oil were produced in China — a decrease of 1.1% year-on-year. Meanwhile 367.99 million tons of petroleum products were produced in China — an increase of 6.3% year-on-year. From January to December 2018, China consumed 325.14 million tons of petroleum products (including diesel and gasoline fuels) — an increase of 6.0% year-on-year. Of this total, the consumption of gasoline fuels increased by 7.8%, and diesel fuels increased by 4.1%. 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 2018, China produced 161.0 billion cubic meters (m³) of natural gas — an increase of 7.5% year-on-year. Meanwhile, China imported 125.6 billion m³ natural gas — an increase of 31.9% year-on-year. From January to December 2018, natural gas consumption reached 280.3 billion m³ — an increase of 18.1% from 2017.

In 2018, China’s auto production and sales were 27.8 million vehicles and 28.1 million vehicles, respectively, with a year-on-year decrease of 4.2% for production and 2.8% for sales.

In 2017, China had 0.414 million new CNG vehicles, while total ownership reached 5.73 million cars — an increase of 7.8% over 2017. In 2017, there were about 200 new CNG stations, and the total number of stations was 5,300 — an increase of 3.9% over 2017. In 2017, more than 90,000 new LNG vehicles were produced, while total ownership reached 0.350 million cars — an increase of 34.6% over the previous year. The total number of LNG stations increased to about 3,100 in 2017.

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 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 5 provincial governments had organized and implemented the pilot projects.

By the end of 2018, 1,024 methanol pilot vehicles were cumulatively utilized in Shanxi, Shanghai, Shaanxi, Guizhou, and Gansu provinces. The pilot cities included Jinzhong, Changzhi, Xi'an, Baoji, Yulin, Hanzhong, Lanzhou, Pinliang, Guiyang, and Shanghai. On March 13, 2013, Jinzhong took the lead in launching the methanol auto pilot in the country. The pilot vehicles included methanol passenger cars, buses, multi-purpose minibuses, and heavy-duty trucks. During the pilot, operating vehicles ran 184 million kilometers (km). The largest single vehicle operating range was 350,000 km. The total consumption of methanol fuel was 24,000 tons.

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 now, ethanol gasoline was promoted in Heilongjiang, Jilin, Liaoning, Henan, Anhui, and Guangxi provinces with a fully closed type. Hubei (9 cities), Shandong (8 cities), Hebei (6 cities), Jiangsu (5 cities), and Inner Mongolia (3 cities) provinces promoted the ethanol gasoline with a semi-closed type. The promotion was expanded in an orderly manner in 15 provinces, including Beijing and Tianjin.

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 2.54 million tons. According to the standard of adding ethanol, about 260,000 tons of fuel ethanol is needed every year.

Outlook

On June 28, 2012, the State Council officially issued the "Development Plan for Energy-Saving and Alternative Energy Vehicle Industry (2010–2020)," which defines the technical pathways and main goals of energy-saving and alternative-energy vehicle development. By 2050, the accumulative output of pure electric vehicles and plug-in hybrid vehicles will reach 500,000; by 2020, the capacity will reach 2 million, and the accumulative production and sales amount will reach more than 5 million. The plan clarified five tasks:

(1) technical innovation project for energy-saving and alternative-energy vehicles, (2) scientific plan for industry structure, (3) accelerated promotion of demonstrations, (4) active promotion of charging equipment manufacturing, and (5) enhancement of step utilization and recycling of power batteries.

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 vehicle (LNG and CNG vehicles) 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.

Plans are that by 2020 the use of methanol gasoline will be up to 2.4 million tons, the number of refitted vehicles will reach 120,000, and new methanol load vehicles will reach 40,000.

Additional Information Sources

- 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
- China EV Corporation, <http://www.chinaev.org/>
- National Development and Reform Commission, <http://www.ndrc.gov.cn/fzgggz/jjyx/gjyx/>
- *2013 Yearbook of Energy-Saving and New Energy Vehicles*, China Economic Publishing House, 2014, <http://www.chinabookshop.net/energysaving-energy-vehicles-yearbook-2013-english-p-19196.html?osCsid=sb14t34uh7lm5b88jdmcvd1v62>