

IEA-Advanced Motor Fuels ANNUAL REPORT 2025

CHINA



China

Drivers and Policies

To achieve China's peak carbon dioxide (CO₂) emissions goal before 2030 and carbon neutrality goal before 2060, China issued a series of forward-looking policies in 2025 to promote carbon reduction, green development, and industrial upgrading. The automotive industry remains a key area for green and low-carbon transition, and advanced motor fuels will continue to contribute significantly to emission reduction in the transport sector and support carbon neutrality targets.

Implementation Plan for Establishing a Carbon Footprint Management System (Full Implementation in 2025)

China fully implemented the Implementation Plan for Establishing a Carbon Footprint Management System, jointly released by the Ministry of Ecology and Environment (MEE) and 15 other ministries in May 2024.

- By 2027: A preliminary carbon footprint management system will be established, including a national general standard for product carbon footprint accounting and about 100 product-specific carbon footprint accounting standards for key products.
- By 2030: The system will be further improved with approximately 200 product-specific standards, a complete carbon footprint factor database, and full implementation of carbon labeling certification and hierarchical management. Accounting rules, factor databases, and certification systems will gradually align with international standards.

This policy provides a fundamental framework for low-carbon fuel certification and market access in China.

Notice on Organizing Technological Breakthroughs and Industrialization Pilots for Green Liquid Fuels (NEA, April 2025)

In April 2025, the National Energy Administration (NEA) officially issued the Notice on Organizing Technological Breakthroughs and Industrialization Pilots for Green Liquid Fuels. The document clearly defines the scope of green liquid fuels, including the following:

- Sustainable aviation fuel (SAF)
- Sustainable diesel
- Sustainable fuel ethanol
- Green methanol
- Green ammonia

The notice officially launched nationwide technological breakthroughs and industrialization pilots for green liquid fuels.

Public Notice of the First Batch of Green Liquid Fuel Pilot Projects (NEA, August 2025)

In August 2025, the NEA publicized the first batch of nine green liquid fuel technological breakthroughs and industrialization pilot projects, including the following:

- One fuel ethanol project
- Three green ammonia projects
- Five green methanol projects

These projects focus on breaking technical bottlenecks, reducing production costs, and verifying the green and low-carbon attributes of products to support large-scale commercial application of green liquid fuels.

Guidelines on Renewable Energy Substitution Actions (In-depth Implementation in 2025)

In 2025, China continued to implement the Guidelines on Vigorously Implementing Renewable Energy Substitution Actions, issued in October 2024 by the National Development and Reform Commission (NDRC), Ministry of Industry and Information Technology (MIIT), and four other ministries.

- 2025 target: National renewable energy consumption exceeded 1.1 billion tons of standard coal equivalent.
- 2030 target: Renewable energy consumption will exceed 1.5 billion tons of standard coal equivalent.

The policy highlights the promotion of SAF; orderly expansion of green liquid fuel pilots for vehicles; and demonstration applications of biodiesel, bio-aviation fuel, biogas, and green hydrogen-ammonia-alcohols in shipping and aviation.

2025 Energy Work Guidelines (NEA, February 2025)

Released on February 27, 2025, the guidelines set clear priorities for advanced motor fuels:

1. Improve energy technology innovation and standardization for hydrogen energy and green liquid fuels.
2. Develop renewable hydrogen production and sustainable fuel industries.
3. Promote pilot applications of fuel cell vehicles and build a national hydrogen energy information platform.
4. Complete pipeline hydrogen transmission pilots in an orderly manner.
5. Accelerate technological breakthroughs and industrial pilots for green liquid fuels.

Notice on the Administrative Measures for the Special Central Budgetary Investment in Energy Conservation and Carbon Reduction (NDRC, 2025)

The measure identifies low-carbon, zero-carbon and negative-carbon demonstration projects as a key support category, with specific focus on the following:

- Demonstration and application of advanced and applicable green and low-carbon technologies.
- Construction of energy supply facilities, infrastructure transformation, and process carbon reduction for zero-carbon parks and zero-carbon transportation corridors to achieve near-zero carbon goals.
- Production projects of green methanol and SAF.
- Construction of large-scale carbon capture, utilization, and storage (CCUS) projects.

Guiding Opinions on Promoting the Absorption and Regulation of New Energy (NDRC and NEA, 2025)

The promotion policy prioritizes the overall development of integrated industrial systems for the production, storage, transportation, and utilization of green fuels (including green hydrogen, ammonia, and alcohols) to develop flexible load resources. It also advances the construction of zero-carbon parks to drive the integrated development of new energy and green fuel industries.

Guiding Opinions on Promoting the Integrated and Interconnected Development of New Energy (NEA, 2025)

Clause IX focuses on the steady construction of comprehensive industrial bases for production of green hydrogen, ammonia, and alcohols (hydrogen-based energy), with the following core provisions:

- Supporting local governments in planning and constructing hydrogen-based energy industries (green hydrogen, ammonia, alcohols, and SAF) in light of green development needs and resource endowments.
- Prioritizing the development of comprehensive industrial bases for renewable-energy-based hydrogen, ammonia, and alcohol production in regions with significant potential for wind and solar energy development and abundant biomass and water resources.
- Coordinating both supply and demand sides to scientifically plan infrastructure — including transportation pipelines, refueling stations, and trans-shipment ports — and efficiently advancing the construction of inter-provincial transportation systems.
- Supporting large-scale production of green hydrogen, ammonia, and alcohols in desert- and water-wind-solar hybrid bases, promoting their application in key fields (e.g., coal and chemical industries and metallurgy) in order to boost industrial development coordination.
- Encouraging coastal regions to explore offshore wind-power-based hydrogen, ammonia, and alcohol production technologies and develop refueling services for green shipping fuels.

Guiding Opinions on the Construction of Zero-Carbon Factories (2025)

Clause II emphasizes accelerating the green and low-carbon transformation of China's energy consumption structure to achieve source carbon reduction, with the following key requirements:

- With the premise of ensuring the safe supply of energy and electricity, encouraging factories to achieve zero-carbon power, heat, hydrogen, and fuel supply; developing and utilizing distributed photovoltaic, decentralized wind power, biomass power generation, and other energy sources as

determined by local conditions; exploring the direct green power connection to increase renewable energy use.

- Encouraging qualified factories to build industrial green microgrids — integrating photovoltaic, wind power, waste heat recovery, new energy storage, high-efficiency heat pumps, and other technologies — to expand use of efficient, multi-source energy schemes.
- Vigorously developing integrated projects on green hydrogen, ammonia, and alcohols and promoting the application of clean and low-carbon hydrogen (e.g., industrial byproduct hydrogen and renewable-energy-based hydrogen).
- Popularizing technologies such as electric boilers, kilns, and heating and ultra-low-emission biomass boilers to replace coal-fired self-provided boilers; accelerating the renewal and transformation of internal combustion vehicles and machinery to renewable energy; and raising the electrification level and proportion of renewable energy for heating and cooling.

National Standards on Alternative Motor Fuels (Newly Implemented in 2025)

A number of national standards were officially implemented in 2025:

- GB/T 44723-2024, Hydrogen internal combustion engines — General technical specification (implemented April 1, 2025)
- GB/T 30366-2024, Biomass vocabulary (implemented October 1, 2024)
- GB/T 42416-2023, M100 methanol fuel for motor vehicles
- GB/T 23799-2021, Methanol gasoline (M85) for motor vehicles
- GB 18351-2017, Ethanol gasoline for motor vehicles (E10)
- GB 25199-2017, B5 diesel fuels
- GB/T 37244-2018, Fuel specification for proton exchange membrane fuel cell vehicles — Hydrogen
- GB/T 40045-2021, Fuel specification for hydrogen-powered vehicles — Liquid hydrogen (LH₂)

Advanced Motor Fuels Statistics

In 2025, China's accelerated the transformation of its energy structure to accommodate low-carbon fuels. Non-fossil energy accounted for more than 60% of total installed power capacity. Renewable energy generation exceeded 3.6 trillion kWh, or about 42% of total electricity production. China 6b standard gasoline maintained full nationwide coverage. Charging infrastructure reached about 13.2 million units.

In 2025, China's automobile production and sales reached 32.47 million and 32.62 million units, respectively. New energy vehicle (NEV) production and sales reached 14.25 million and 14.18 million units, with a market penetration rate of 43.5%. Battery electric vehicles (BEVs) accounted for about 60% of NEV sales, and plug-in hybrid electric vehicles (PHEVs) about 40%.

Hydrogen fuel cell vehicle (FCV) sales in 2025 reached 10,782 units, mainly trucks and buses. The number of hydrogen refueling stations in operation exceeded 570. Natural-gas-fueled heavy-duty truck sales maintained their growth, with major markets in Shanxi, Hebei, Henan, Shandong, and Guangdong.

China's methanol vehicle population exceeded 62,000 units in 2025, with commercial vehicles accounting for 85%. Annual methanol fuel consumption exceeded 3.5 million tons, replacing about 2.1 million tons of gasoline. The nationwide supply of E10 ethanol gasoline and B5 biodiesel remained stable. SAF and green liquid fuel pilots expanded steadily.

Research and Demonstration Focus

Promotion of Methanol Gasoline Vehicles Pilot Project (2025)

In 2025, methanol vehicle pilots were further expanded in Shanxi, Guizhou, Shaanxi, Gansu, and Inner Mongolia.

- Shanxi continued to provide subsidies up to 50,000 RMB per methanol heavy-duty truck and upgraded more of its methanol refueling stations along major freight corridors.

- Guizhou expanded its methanol vehicle fleet to more than 23,000 units supported by 103 refueling stations, reducing regional gasoline dependence by about 10%.
- Hohhot, Inner Mongolia, built a methanol vehicle manufacturing base with an annual capacity of 10,000 units, planning to deploy 4,000 methanol trucks for coal transportation by 2026.
- Shenyang, Gansu, and Shaanxi granted methanol vehicles and EVs equal road rights and promoted methanol trucks in mining and logistics.

By 2025, methanol vehicles from Geely and other manufacturers had been driven more than 13 billion kilometers, verifying technology maturity.

Promotion of Hydrogen Fuel Cell Electric Vehicles Pilot Project (2025)

In 2025, demonstration projects in five national FCV city clusters (BeijingTianjinHebei, Shanghai, Guangdong, Hebei, Henan) achieved large-scale FCV application.

- More than 570 hydrogen refueling stations were in operation, an increase of 14% compared with 2024.
- Commercial vehicles accounted for 85% of FCVs, especially in long-haul logistics and port scenarios.
- Fuel cell system cost dropped to 1,800–2,200 RMB/kW thanks to large-scale localization.
- Local policies included freeway toll exemptions and annual mileage subsidies up to 150,000 RMB per truck.
- Hydrogen passenger cars achieved hydrogen consumption of 1.2–1.4 kg/100 km with a refueling time of less than 4 minutes.

By the end of 2025, China's FCV fleet exceeded 39,000 units, reducing CO₂ emissions by more than 260,000 tons.

Green Liquid Fuels and Sustainable Aviation Fuel Demonstration (2025)

In 2025, China launched the first batch of national green liquid fuel pilots covering biomass-based fuels, carbon capture and utilization (CCU)-derived alcohols, and green ammonia. Projects focused on integrated production-supply-use systems and carbon footprint verification. SAF demonstration was expanded in civil aviation, supporting low-carbon development in air transport.

Outlook

China will continue to promote clean energy development and strengthen green and low-carbon policies to steadily advance carbon peaking and carbon neutrality.

- China will establish a complete carbon footprint management system for automotive products and fuels.
- The industry will increase investment in green manufacturing, low-carbon R&D, green materials, and a circular economy.
- NEVs will accelerate the replacement of traditional fuel vehicles.
- Hydrogen, methanol, green ammonia, and SAF will move from demonstration to large-scale commercial application.
- Fuel supply infrastructure will be further improved.
- China will deepen alignment with international standards and actively participate in global low-carbon fuel governance.

Additional Information Sources

- Ministry of Ecology and Environment (MEE)
- National Development and Reform Commission (NDRC)
- Ministry of Industry and Information Technology (MIIT)
- National Energy Administration (NEA)
- China Association of Automobile Manufacturers (CAAM)
- Commercial Vehicle World (CV World)