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Review and Optimization of Legislation and Policy Formulation for China's Methanol Fuel Industry Under the "Dual Carbon" Goal

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Abstract: ***As a crucial component of clean energy, methanol fuel plays a pivotal role in advancing energy structure transformation and achieving the "dual carbon" goals. However, the development of China's methanol fuel industry currently faces numerous challenges, hindering its progress. An analysis of the current status of legislation and policy formulation for the industry reveals that inadequate legislation, contradictions in economic incentive policies, inconsistent standard systems, and insufficient attention to supporting infrastructure construction have weakened the role of policies and laws in promoting industrial development. Therefore, in the future, China should focus on improving the legal framework for the methanol fuel industry, optimizing economic incentive policies, refining the methanol fuel standard system, and rationally planning the construction of supporting infrastructure. This will help explore an energy consumption system that not only ensures energy security but also achieves clean utilization and environmental friendliness.***

Keywords: Clean Fuel, Methanol Fuel Industry, Legislation, Policy Formulation**.**

1. Introduction

With the global transformation of energy structures and the increasing awareness of environmental protection, the development and utilization of clean energy have become an important part of energy strategies worldwide. In China, methanol fuel, as a promising clean energy source, has attracted widespread attention due to its significant advantages in reducing greenhouse gas emissions and improving air quality. However, the current development of China's methanol fuel industry faces various challenges that restrict its further development and application. Identifying the root causes of these problems and exploring reasonable solutions are crucial for the development of the methanol fuel industry.

2. Practical Needs for Legislation and Policy Formulation of China's Methanol Fuel Industry Under the "Dual Carbon" Goal

Within the strategic context of advancing the dual carbon goals, to comprehensively safeguard national energy security and accelerate the low-carbon transition of energy, while promoting the standardised and sustainable development of the methanol fuel industry, China's methanol fuel sector exhibits significant multidimensional and systemic demands for legislation and policy formulation. Chin's energy structure is characterised by 'oil scarcity, gas deficiency, and coal abundance', with high dependence on imported petroleum and natural gas, making energy security a pressing priority. Meanwhile, China is rich in coal resources and has become the world's largest methanol producer. As a low-carbon fuel with diverse raw material sources, methanol can be produced through multiple methods—utilizing not only coal but also integrating coke oven gas, coalbed methane, biomass, carbon dioxide, and other resources. In particular, the "liquid sunshine" technical route of "green electricity to green hydrogen + carbon dioxide capture and synthesis" achieves a carbon-neutral cycle, featuring both large-scale absorption of renewable energy and resource utilization of carbon dioxide. This provides important support for China to build a new energy system that is clean, low-carbon, safe, and efficient. Therefore, promoting the application of methanol as a fuel and realizing its low-carbon and clean utilization is not only a demand for China to develop a diversified energy system but also a global consensus, as well as an important pathway to achieve the "dual carbon" goals.

From the perspective of regulating the development of the methanol fuel industry, methanol's nature as a hazardous chemical requires clear safety standards and responsibilities through legislation and policy formulation throughout the entire industrial chain, from raw material supply, production and preparation, storage and transportation to refueling and sales. Currently, issues such as unclear management attribution of methanol fuel and ambiguous approval processes for the construction of refueling stations highlight the practical urgency of improving laws and regulations on safe production and supervision. Additionally, as a strategic emerging industry, the methanol fuel industry has enormous market potential, attracting numerous new entrants and traditional energy enterprises to transform and deploy. To avoid disorderly competition and protect the interests of investors and consumers, legislation and policy formulation can guide the formation of stable market expectations. Relying on the construction of a standard system (such as the definition of green methanol, carbon footprint accounting, and specifications for refueling facilities) is conducive to promoting high-quality industrial development.

Furthermore, since public perception and social acceptance are key variables affecting the industrialization and promotion of methanol fuel, the long-standing misunderstanding that "methanol is toxic and cannot be used as fuel" urgently needs to be corrected through policy guidance and popular science publicity. The information disclosure and educational functions in the legislative process help highlight the advantages of methanol fuel in environmental friendliness (significantly reducing emissions of carbon monoxide, nitrogen oxides, and particulate matter compared to traditional fuels) and safety (controllable risks under standardized

management), thereby enhancing social consensus and creating a favorable social environment for the industry.

3. Current Status of Legislation and Policy Formulation for China's Methanol Fuel Industry Under the "Dual Carbon" Goal

As of December 2025, there is no national-level legal document titled "Clean Fuel" in China. At the local level, there is only one valid policy and legal document named "Clean Fuel"—the "Regulations on the Administration of Clean Fuel Vehicle Refueling Stations in Beijing." This regulation mainly governs the management of clean fuel vehicle refueling stations in Beijing and is not a comprehensive legal document regulating the production, operation, use, disposal, and other links of clean fuel. The "Measures for the Administration of the Use of Clean Fuel in Automobiles in Harbin" adopted by the Harbin Municipal People's Government in 2009, which aimed to strengthen the management of clean fuel use in the automobile sector, has been abolished. To prevent and control air pollution, two local normative documents—the "Announcement of the Changsha Municipal People's Government on Promoting the Use of Clean Fuel in the Catering Service Industry in Urban Areas" (1999) and the "Notice of the General Office of the Hohhot Municipal People's Government on Promoting the Use of Clean Fuel in Taxis Citywide" (2004)—respectively stipulate the promotion of clean fuel use in the local catering service industry and taxi sector.

Among the legal documents mentioning "clean fuel," from the perspective of more stable and authoritative laws, Article 45, Paragraph 2 of the "Energy Conservation Law" stipulates: "The state encourages the development and promotion of clean fuels and petroleum alternative fuels for use in transportation vehicles." Article 16 of the "Renewable Energy Law" states: "The state encourages the clean and efficient development and utilization of biomass fuels and the development of energy crops." It also stipulates: "The state encourages the production and utilization of bio-liquid fuels. Petroleum sales enterprises shall incorporate bio-liquid fuels that meet national standards into their fuel sales systems in accordance with the provisions of the competent energy department of the State Council or the people's government of a province, autonomous region, or municipality directly under the Central Government." At the administrative regulation level, none of the 599 currently effective administrative regulations in China mention "clean fuel." However, 7 normative documents issued by the State Council refer to "clean fuel," mainly encouraging the use of new types of clean fuel and the development and promotion of clean fuel vehicles. Among the currently effective normative documents issued by State Council departments, 146 mention "clean fuel," with issuing departments mainly focusing on the Ministry of Transport, the Ministry of Ecology and Environment, the National Development and Reform Commission, the Ministry of Industry and Information Technology, the Ministry of Science and Technology, and the National Energy Administration. The content mainly involves encouraging the use of clean fuel, promoting the application of clean fuel in transportation vehicles, clean fuel substitution in civil stoves and industrial kilns, clean fuel production technology, and requirements for clean fuel in the coal chemical industry.

At the local level, there are 40 provincial and municipal local regulations, 5 autonomous regulations and separate regulations, 6 local government rules, 443 local normative documents, and 1,862 local working documents that mention "clean fuel" in their provisions. This largely reflects the attention paid to clean fuel by various regions. Most content related to clean fuel is stipulated in local regulations on air pollution prevention and control and ecological environmental protection, reflecting the positive environmental effects of clean fuel. Issued local regulations such as the "Measures of the Inner Mongolia Autonomous Region for the Implementation of the Energy Conservation Law of the People's Republic of China" (revised in 2022), the "Ordinance of Ordos City on the Ecological Environmental Protection of Natural Gas Development" (formulated in 2023), and the "Regulations of Nanchang City on Promoting Low-Carbon Development" (revised in 2019) not only explicitly encourage, support, and promote the use of clean fuel in transportation vehicles, heating, rural energy construction, and other fields but also specify situations where the use of clean fuel is mandatory, such as in ancient cities, scenic spots, and business premises. These provisions are beneficial to the development of the clean fuel industry, including the methanol fuel industry. In addition, a large number of guiding documents, administrative approvals, outlines, and specific work arrangements formed by local governments in the implementation of clean fuel-related regulations also play an important role in promoting the development of related industries.

Table 1: Statistics of Policies Mentioning "Clean Fuel"

Document Type	Quantity (pieces)
Departmental Normative Documents	43
Departmental Working Documents	102
Local Normative Documents	443
Local Working Documents	1862

Regarding methanol fuel, its legal normative system mainly includes two parts: first, generally applicable laws, mainly legal norms regulating fuel promotion and application, safe production, etc., such as the "Energy Conservation Law of the People's Republic of China" and the "Work Safety Law of the People's Republic of China"; second, relevant policies targeting the development of the methanol fuel industry, mainly including policies regulating methanol production, such as the "Medium and Long-Term Development Plan for the Hydrogen Energy Industry (2021-2035)", the "Implementation Plan for Science and Technology Supporting Carbon Peaking and Carbon Neutrality (2022-2030)", and the "Benchmark Energy Efficiency Levels for Key Industrial Sectors (2023)"; policies regulating the application of methanol fuel—To build a methanol economy, governments at all levels from the central to local have issued relevant policies focusing on methanol vehicles in recent years, such as the "Guiding Opinions on Carrying out the Application of Methanol Vehicles in Some Regions", the "14th Five-Year Plan for Green Transportation Development", the "14th Five-Year Plan for Industrial Green Development", the "Measures for the Collection and Management of Pilot Technical Data of Methanol Vehicles", the "Specifications for the Construction of Methanol Fuel Refueling Stations for Vehicles", and the "Safety Specifications for Methanol Fuel Operations for Vehicles". In addition, the application of methanol has been

expanded to encourage the promotion of methanol-fueled ships, such as the "Catalogue for the Guidance of Industrial Structure Adjustment (2024)" and the "Guiding Opinions on Accelerating the Green Development of the Manufacturing Industry"; to promote the wider application of methanol fuel, the central government has also introduced economic incentive policies, including financial subsidies, tax reductions and exemptions, R&D expense deductions, and special local government support. Regions such as Shanxi, Guizhou, and Shaanxi have also issued relevant policies to encourage the production and promotion of methanol vehicles and the construction of methanol refueling stations. Furthermore, a preliminary standard system for methanol fuel has been established, covering four levels: national standards, local standards, industry standards, and group standards. Clean fuels for automotive, industrial, civil, and other purposes are regulated by standards, providing legal basis for their production, testing, distribution, and application. Examples include the national standard GB/T 23510-2009 "Methanol for Motor Fuel", the local standard DB14/T 1043-2015 "Design and Construction Specifications for M85 and M100 Methanol Fuel Refueling Stations for Vehicles", the industry standard NB/T 34013-2023 "Agricultural Alcohol-Ether Diesel Fuel", and the group standard T/AHJC 0005—2023 "Alcohol-Based Clean Fuel".

In summary, China has adopted multi-level and multi-field measures in advancing legislation and policies for the methanol fuel industry, covering methanol fuel production, promotion and application, public incentives, and technical standards. These efforts aim to promote the industrialization of methanol fuel, accelerate energy structure transformation, reduce pollutant emissions, and assist in achieving the "dual carbon" goals.

4. Analysis of Problems in Legislation and Policy Formulation for China's Methanol Fuel Industry Under the "Dual Carbon" Goal

After long-term development, China's methanol fuel industry has made considerable progress. The strong vitality of the new market urgently calls for relevant legal norms, which in turn should play a role in encouraging and guiding the development of the methanol fuel industry. By sorting out the current situation of legislation and policy formulation for the methanol fuel industry, existing problems are identified to more effectively formulate feasible solutions.

4.1 Inadequate Legislation and Lack of High-Level Legislation

China lacks high-level and systematic legal norms to regulate the clean fuel industry. Although the "Energy Conservation Law" mentions clean fuels used in the transportation sector and the "Renewable Energy Law" provides principled provisions for the development of clean fuels to a certain extent, their relevance is low and they are too principled to produce practical effects. The absence of high-level laws and regulations has led to a lack of stability in the normative basis for the clean fuel industry. In practice, the methanol fuel industry is mainly regulated by policy documents, which are unstable. This means that the methanol fuel industrial chain faces uncertainties caused by policy changes. Problems such as increased operational risks, higher compliance costs, reduced R&D and innovation motivation, and a deteriorating financing environment have brought significant challenges to this "sunrise industry" in the clean energy field.

4.2 Contradictions in Economic Incentive Policies

Policies and laws are the basis for incentive systems such as financial subsidies and tax reductions and exemptions, and are important guarantees for the promotion of clean fuels. However, there are certain contradictions between China's economic incentive policies and the national "dual carbon" goals. Taking the upstream sector of methanol fuel—the coal-to-methanol industry—as an example, as the world's largest methanol producer, China produces more than 80% of its methanol using abundant coal resources. Although coal-to-methanol is in line with the national strategy of energy substitution, some coal-to-methanol projects, especially large-scale demonstration projects, have received financial support from the central and local governments, providing capital subsidies for enterprise technological upgrading and environmental protection technology investment. In addition, some regions rich in coal resources have established local industrial funds to promote the development of the local coal chemical industry and coal-to-methanol industry. However, this contradicts China's "dual carbon" goals, as the production process consumes a large amount of coal, resulting in high emissions of carbon dioxide and other pollutants. Although the state has attached great importance to energy efficiency issues in the coal-to-methanol industry in recent years and issued a number of restrictive policies—for example, in June 2023, the National Development and Reform Commission and other departments issued the "Benchmark and Baseline Energy Efficiency Levels for Key Industrial Sectors (2023 Edition)", which clarified the renovation, upgrading, and elimination time limits for coal-to-methanol, proposing that coal-to-methanol projects should, in principle, complete technological transformation or phase out by the end of 2025—there are still coal-to-methanol production capacities in China with energy efficiency below the baseline level. In addition, due to differences in resources, economic development levels, and policy orientations among different regions, local governments' economic incentive measures for methanol vehicles are inconsistent and vary greatly. In regions rich in coal resources, the production cost of coal-to-methanol is low, and local governments have adopted relatively active policies to promote methanol vehicles. For example, Shanxi Province has issued a series of policies to promote the development of the methanol vehicle industry, including large-scale pilots of methanol vehicles, provision of policy subsidies and tax incentives, as well as financial and policy support for methanol fuel refueling stations. In contrast, in coastal regions or economically developed cities with relatively scarce methanol resources, due to high local environmental protection pressure, the carbon emission advantage of methanol vehicles is not prominent compared to electric vehicles. Local governments tend to promote zero-emission pure electric or hydrogen fuel vehicles in terms of policies, and provide less policy support for methanol vehicles. This leads to differences in the development progress of methanol vehicles and variations in the acceptance of

methanol fuel among different regions, putting the promotion, popularization, and application of methanol fuel in a difficult position.

4.3 Problems in the Existing Methanol Fuel Standard System

Clean fuel not only requires the fuel itself to be clean but also must strictly limit the content of harmful substances in the exhaust gas emitted by fuel combustion. Popularizing the use of methanol fuel and the clean production of methanol can help China achieve carbon peaking and carbon neutrality earlier. However, due to the lack of standards during the development of methanol fuel, many product quality problems have occurred in the methanol fuel market. Given the uneven development within China's methanol fuel industry, it is necessary to establish unified standards to regulate the production and quality of methanol fuel. Currently, China's standard system for methanol fuel covers multiple levels, including national standards, local standards, industry standards, and group standards. However, the existing standard system still has some problems that restrict the promotion and application of methanol fuel to a certain extent.

1) Problems with National Standards

Although China has formulated some national standards related to methanol fuel, such as "Methanol for Motor Fuel" (GB/T 23510-2009) and "Additives for Methanol Gasoline for Motor Vehicles" (GB/T 34548-2017), there are still gaps in standards for certain key areas. For example, there are no comprehensive and unified national standards for methanol fuel mixing standards, production process specifications, and the impact of methanol fuel on vehicle engines and emission systems. In addition, some existing national standards were formulated in the early stage of methanol fuel promotion and may no longer fully meet current technical needs with the development of methanol fuel technology. For instance, the mandatory national standard "Alcohol-Based Liquid Fuels" (GB 16663-1996), which has been in effect since 1996, is outdated but still valid. The new standard is under drafting, with a revision cycle of 16 months.

2) Problems with Local Standards

Due to differences in methanol resources, production capacity, and market demand among different regions, local governments have formulated local standards based on their own conditions, leading to inconsistencies or even conflicts between local standards and national standards. Taking alcohol-based liquid fuels for catering use as an example, various regions have issued corresponding local standards, but the provisions on the alcohol content in alcohol-based liquid fuels vary. Inconsistencies in standards such as the ratio of methanol fuel, types and limits of additives in different provinces result in uneven quality of methanol fuel across regions. This problem is particularly prominent for vehicles transporting and using methanol fuel across regions. Some regions in China have formulated stricter methanol fuel standards than national standards out of consideration for local economic development and environmental protection. For example, certain provinces may require higher methanol purity or fewer harmful emissions, while other regions have no corresponding requirements. Such standard differences make it difficult to unblock the cross-regional methanol fuel supply chain, increase the production and operation costs of enterprises, and hinder the national promotion of methanol vehicles.

3) Problems with Industry Standards and Group Standards

At the level of industry standards and group standards, numerous enterprises, industry associations, and scientific research institutions participate in the formulation process. Different entities formulate standards based on their own interests and needs, leading to inconsistent standard content. Different automobile manufacturers or fuel suppliers may formulate different standards for methanol fuel or vehicle use according to their respective technical routes or market positioning, lacking unified specifications. Moreover, the technical capabilities and market influence of formulating entities vary, resulting in uneven technical levels of some standards. Some enterprises may formulate overly stringent group standards to gain market competitive advantages, forming standardization monopolies, while others may be overly loose and lack scientific basis. This further leads to inconsistencies in the quality and performance of methanol fuel and vehicles on the market, as well as problems with compatibility and safety of related products, affecting the overall development of the methanol fuel industry and hindering the large-scale national promotion of methanol fuel.

4.4 Insufficient Attention to the Construction of Methanol Fuel Supporting Infrastructure

The development of the methanol fuel industry and the expansion of methanol fuel application channels require the support of corresponding supporting infrastructure. Methanol fuel supporting infrastructure mainly includes methanol refueling stations, methanol vehicle maintenance service stations, and methanol fuel transportation and distribution systems. China has adopted some policies and measures in the construction of supporting infrastructure, but overall, there is a lack of unified national laws, regulations, and policy support for promoting the application of methanol fuel, and insufficient attention has been paid to the construction of methanol fuel supporting infrastructure, mainly reflected in the following aspects:

First, as a new type of energy supply station, methanol refueling stations provide methanol fuel. This is not only related to fuel quality but also to the smooth progress of clean energy vehicle production and manufacturing projects. Currently, some regions (such as Shanxi and Guizhou) have local government support and pilot projects, but at the national level, the policies for the layout and development of methanol refueling stations are not systematic or comprehensive. Due to methanol fuel's certain toxicity and flammability, it is classified as a hazardous chemical. The state implements a licensing system for the operation of hazardous chemicals. The construction of methanol refueling stations requires strict safety supervision and complex approval procedures. However, local governments have different attitudes towards the approval of methanol refueling stations, resulting in difficulties in obtaining licenses and constructing stations in some regions.

Second, the establishment and improvement of methanol vehicle maintenance service stations are important links in the development of the methanol vehicle industrial chain. Methanol vehicles use methanol fuel, and their engine systems, combustion control, and emission treatment are different from traditional gasoline vehicles. Methanol is corrosive and has specific requirements for materials and components, requiring professional maintenance technology and tools for maintenance and repair. However, China's methanol vehicle maintenance service system is not yet perfect. Methanol vehicles are mainly promoted in specific pilot cities or regions, and relevant service stations are concentrated in these areas. The national coverage rate of methanol vehicle maintenance outlets is still very low and seriously lags behind.

Third, methanol fuel has broad application prospects in various fields such as transportation, industry, and power generation. However, most regions have not established a sound transportation and distribution system, resulting in unstable methanol fuel supply. Regions rich in methanol resources have a large market demand for methanol vehicles, but there is a situation where methanol vehicles cannot be applied and implemented. The state needs to accelerate the unified planning of the methanol fuel transportation and distribution system.

5. Optimization Paths for Legislation and Policies of China's Methanol Fuel Industry Under the "Dual Carbon" Goal

Comprehensively considering the existing problems and practical challenges in the policies and laws governing China's methanol fuel industry, based on the carbon peaking and carbon neutrality goals, and combined with research findings, this paper focuses on improving the legal framework for the clean fuel industry, optimizing economic incentive policies for methanol fuel, constructing the methanol fuel standard system, and building supporting infrastructure. By improving laws and policies, more stable support will be provided for the methanol clean fuel industry, thereby promoting the R&D, promotion, and application of methanol fuel.

5.1 Improve the Legal Framework for the Clean Fuel Industry

Clean fuels, including methanol fuel, lack high-level legal norms, and the specific policy orientation and legal framework are not perfect. Given China's commitment to achieving the "dual carbon" goals, the important role of clean fuels in energy structure adjustment and emission reduction, and the low level of understanding and acceptance of clean fuels among the public and even some administrative authorities, it is necessary to include more targeted provisions on clean fuels in higher-efficiency laws. However, legislation is a complex and long-term process that requires comprehensive consideration of various factors. Considering the rapid development needs of the clean fuel industry, adjustments can be made within the existing legal framework to promote the development of the clean fuel industry. The current "Energy Conservation Law", "Renewable Energy Law", and other laws already contain provisions related to clean fuels. By amending these laws and adding more specific clauses on clean fuels, the complex process of formulating new laws can be avoided, while ensuring that the clean fuel industry receives clear legal support. For example, clearly defining clean fuels as part of renewable energy or low-carbon energy and incorporating them into the national energy strategy; setting application goals and development directions for clean fuels, specifying relevant financial subsidies, tax incentives, and industrial support measures; and strengthening provisions on fuel production, application, and emission standards. In addition, the State Council or various ministries and commissions can issue special administrative regulations and departmental rules to comprehensively regulate the production, operation, use, disposal, and other links of clean fuels. Compared with laws, these can be adjusted more flexibly in response to changes in the types and applications of clean fuels.

5.2 Optimize Economic Incentive Policies for the Methanol Fuel Industry

To ensure that China's economic incentive policies play an important role in supporting the achievement of national "dual carbon" goals, efforts should be made to encourage and support technological innovation in environmental protection in the coal-to-methanol industry, such as carbon capture, utilization, and storage (CCUS), which is still in the R&D or initial application stage. Increase support for biomass-based green methanol fuel projects to reduce carbon emissions and improve energy efficiency. For innovative technologies that have received scientific research funding support, encourage enterprises to cooperate with scientific research institutions to accelerate the application of technological innovation in industrial production, thereby reducing adverse environmental impacts. In addition, strictly enforce the renovation, upgrading, and elimination time limits for coal-to-methanol. Those that fail to complete technological transformation within the specified time limit shall be phased out of the market. At the same time, strict market access for the coal chemical industry can be established, stipulating that coal-to-methanol enterprises must meet certain technical and environmental standards to enter the market, preventing low-level redundant construction and eliminating the possibility of backward production capacity receiving economic incentives.

To address the inconsistency of local policies in the promotion of methanol vehicles, the central government should formulate a national policy framework covering the entire industrial chain of methanol vehicles, clarifying core content such as promotion goals and subsidy standards for methanol vehicles, and implementing it uniformly nationwide. Considering the differences in resources and economic structures among regions, the central government should allow local governments to make appropriate adjustments within the unified framework when formulating unified policies. For this purpose, a policy adjustment mechanism can be established, allowing local governments to adjust subsidy intensity and implementation scope according to actual conditions, but they must report to the central government for the record to ensure that policy adjustments comply with regulations and the overall development strategy. In addition, the central government can establish a special assessment mechanism to evaluate the performance of local governments

in promoting methanol vehicles. Key indicators such as methanol vehicle promotion goals and infrastructure construction milestones can be set to regularly inspect and evaluate the implementation of local governments. Through transparent policy implementation and regular supervision, the fairness and consistency of methanol vehicle promotion can be ensured.

5.3 Improve the Methanol Fuel Standard System

The issuance and implementation of standards play an important role in regulating the production of methanol fuel, improving fuel quality, enhancing industry competition, and promoting market supervision. To address the problems in the existing methanol fuel standard system, efforts can be made in three aspects: improving national standards, promoting the connection between local standards and national standards, and regulating industry and group standards. First, the central government should promptly improve national standards related to methanol fuel, revise existing outdated national standards, including key links such as fuel ratio, production processes, additive use, and environmental emission standards. At the same time, with the development of technology, national standards should be dynamically updated to ensure they are in line with the latest technological and market needs. Second, the central government should require local standards to be consistent with national standards and establish an effective coordination mechanism between local standards and national standards to avoid market segmentation and uneven product quality caused by excessive differences in local standards. It is recommended to strengthen the supervision and evaluation mechanism of local standards to ensure that local standards are consistent with national standards in the implementation process. Finally, it is necessary to guide industry associations and group standard-setting institutions to maintain technical consistency with national standards, preventing market chaos caused by excessive differences in enterprise standards. Promote the issuance of more representative and credible group standards, encourage technical cooperation and standard unification within the industry, and create a more favorable environment for the promotion and application of methanol fuel.

5.4 Uniformly Plan the Construction of Methanol Fuel Supporting Infrastructure

In 2015, the Ministry of Industry and Information Technology issued the “Specifications for the Construction of Methanol Fuel Refueling Stations for Vehicles”, aiming to promote the standardized construction of methanol fuel refueling stations, but it did not involve the national construction plan for methanol refueling stations. At the national level, China should issue a special construction plan for methanol refueling stations, coordinate the layout of the national refueling station network, clarify the number of refueling stations to be built, regional distribution, and standard specifications, ensuring that infrastructure construction keeps pace with the promotion of methanol vehicles. Especially in regions with high cross-regional transportation and travel demand, priority should be given to the layout of the methanol refueling station network to improve the convenience of using methanol vehicles. Local governments need to actively cooperate with national infrastructure planning, provide support such as land and funds, especially in the construction of key facilities such as refueling stations, simplify the approval process for refueling stations, and encourage social capital to participate in the construction and operation of methanol refueling stations through policies to further accelerate the improvement of infrastructure.

Promote the national layout of methanol vehicle maintenance service outlets, and take the lead in establishing methanol vehicle maintenance technology training centers in key promotion regions to improve the professional level of maintenance personnel. Issue technical specifications and certification standards for methanol vehicle maintenance services. Conduct overall national planning for the methanol fuel transportation and distribution system, especially strengthening the construction of the transportation and distribution network for methanol fuel from production to use, ensuring stable fuel supply between different regions, thereby promoting the promotion and application of methanol fuel.

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