NEV Development Plan 2035

Policy Briefing & English Translation

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CHINA ISSUES THE BLUEPRINT FOR ITS ELECTRIC VEHICLE AND INTELLIGENT CONNECTED VEHICLE INDUSTRY DEVELOPMENT FOR THE NEXT 15 YEARS!

Policy Briefing by Sebastian Ibold, Xia Yun and Xiao Shuyue

On 02 November 2020, the *New Energy Vehicle Industry Development Plan (2021-2035)* was published by the State Council Office of the People's Republic of China.

The *New Energy Vehicle Industry Development Plan (2021-2035)* is a strategic top-level policy guiding the development of a comprehensive and fully integrated New Energy Vehicle (NEV) and Intelligent Connected Vehicle (ICV) eco-system in China over the course of the next 15 years and is part of the comprehensive roadmap to develop China into a global automotive powerhouse.

The plan follows the *Energy Conservation and New Energy Vehicle Industry Development Plan (2012-2020)*[1], which was issued by the State Council in 2012.

The *New Energy Vehicle Industry Development Plan (2021-2035)* in eight chapters lays out the future trends and key fields for the NEV and ICV industry and market development in China, aiming to systematically:

- promote and guide sustainable and market-oriented NEV and ICV development,
- deeply integrate China's NEV industry into the global industrial and value chains,
- deepen regulatory reforms and improve the policy and regulation system,
- improve core technology and foster technological innovation (e.g. battery technology and management, fuel cell systems, materials, high precision mapping, V2X),
- promote cross-industry and cross-domain (e.g. transport, energy, ICT) integration,
- build and improve ICT and NEV (e.g. V2X, electric charging infrastructure, hydrogen infrastructure) infrastructure,
- promote intelligent manufacturing,
- strengthen intellectual property protection,

[1] http://www.gov.cn/gongbao/content/2012/content_2182749.htm

- strengthen organizational coordination,
- strengthen international cooperation

The policy is based on the assumption that the NEV industry eco-system is evolving from a "chain relationship" between parts, vehicle development and production, marketing and service enterprises, to a "eco-network system" between the automobile industry, and the energy, transportation, information and communication sectors among others.

The *New Energy Vehicle Industry Development Plan (2021-2035)* lays out 4 principles which are guiding the future development of China's NEV and ICV eco-system:

1. **Market-led development**

   China will give full play to the decisive role of the market in the allocation of resources, strengthen the main role of enterprises in the selection of technology routes,
   production and service system construction; better play the role of the government in strategic planning and guidance, standards and regulations, quality and safety supervision, market order maintenance, green consumer guidance, etc., to create a favorable environment for industrial development.

2. **Innovation-driven development**

   China will deepen the implementation of the innovation-driven development strategy, establish an enterprise-oriented, market-oriented and industry-university-research-application collaborative technological innovation system, improve the institutional
   environment that stimulates and protects innovation, encourage the parallel development of various technological routes, support various types of subjects to work together
   to overcome key core technologies, increase the strength of business model innovation, and form a new type of industrial innovation eco-system.

3. **Coordinated promotion**

   China will improve the coordination mechanism of horizontal coordination and vertical integration, promote the deep integration of NEVs with the energy, transportation,
   information and communication sectors, and coordinate technical R&D, standard formulation, promotion and application, and infrastructure construction, so as to turn the massive market advantages into industrial advantages.

4. **Open development**

   China will practice the concept of cooperation based on openness, inclusion and mutual benefit and win-win cooperation, expand the opening up to the outside world at

a high level, and promote reform, development and innovation with openness; China will
adhere to the combination of "bringing in" and "going out", strengthen international cooperation, actively participate in international competition, cultivate new advantages in the automotive industry, so as to realize deep integration into the global industry chain and value chain system.

The *New Energy Vehicle Industry Development Plan (2021-2035)* lays out following targets for 2025 and 2035:

- By 2025, China's NEV market will be significantly more competitive, with major breakthroughs in key technologies such as traction batteries, motor and vehicle operating systems, and an overall improvement in safety standards. The average power consumption of new pure electric passenger cars will be reduced to 12.0 kWh/100 km (currently more than 15 kWh/100 km), NEV sales will reach about 20% of total new car sales (currently 5%), highly automated driving vehicles will be commercialized in limited areas and specific scenarios, and the convenience of charging and battery swapping services will be significantly improved.
- By 2035, the core technology of NEVs in China will reach the international advanced level, and the quality of brands will have strong international competitiveness. Pure electric vehicles will become the majority of new vehicles sold, public sector vehicles will be fully electrified, fuel cell vehicles will be commercialized, highly automated vehicles will be adopted on large scale, the charging and battery swapping service network will be convenient and efficient, and the construction of the hydrogen fuel supply system will be steadily advanced, which will effectively promote energy conservation and emission reduction and improve the efficiency of the society.

Conclusion:

The *New Energy Vehicle Industry Development Plan (2021-2035)* is a top-level development blueprint which not only aims at the more market-oriented, and sustainable development of China's NEV and ICV industry but is a guideline for the comprehensive transformation of the country's automotive industry and market as part of a holistic inter-connected eco-system including transport, energy and ICT. The policy can be seen as a stepping-stone, guiding towards the long-term oriented target of China to become a globally highly competitive automotive innovation powerhouse.

For further information, please also read our articles:

- *Outline for Building China's Strength in Transport – How China Wants to Become a Global Transport Superpower*
  Link: http://www.sustainabletransport.org/archives/7316
- *New Energy Buses in China: Overview on Policies and Impacts*
  Link: http://www.sustainabletransport.org/archives/7772

Please find below the translation of the original policy *New Energy Vehicle Industry Development Plan (2021-2035)* into English language (provided by Sebastian Ibold, Xia Yun and Xiao Shuyue of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH)

Link to the original policy: http://www.gov.cn/zhengce/content/2020-11/02/content_5556716.htm

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People's Governments of provinces, autonomous regions and municipalities directly under the Central Government, ministries and commissions under the State Council, and agencies directly under the State Council.

The New Energy Vehicle Industry Development Plan (2021-2035) has been agreed by the State Council, and is hereby issued.

General Office of the State Council

October 20, 2020

(This is a public release.)

New Energy Vehicle Industry Development Plan (2021-2035)

The development of New Energy Vehicles (NEVs) is the only way for China to develop from a major automotive country to an automotive powerhouse, and is a strategic measure to address climate change and promote green development. In 2012, the State Council issued the *Energy Conservation and New Energy Vehicle Industry Development Plan (2012-2020)*[2]. Since then, China has adhered to the pure electric-oriented strategy, bringing tremendous achievements in the NEV industry, which has become one of the important forces in the development and transformation of the global automobile industry.

At the same time, China's NEV development is also facing challenges such as lacking innovation in core technology, need for improvement of the quality assurance system, infrastructure construction is still lagging behind, the industrial eco-system is still not sound, and the market becomes increasingly competitive. In order to promote the high-quality development of the NEV industry and to accelerate the construction of an automobile powerhouse, this plan is formulated.

[2] http://www.gov.cn/gongbao/content/2012/content_2182749.htm

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Chapter I Development Trends

Section I. NEVs provide new impetus to global economic development

At present, a new round of global scientific and technological revolutions and industrial changes are progressing vigorously, accelerating the integration of automobiles with energy, transportation, information and communication and other related technologies, with electrification, network connectivity and intelligent systems becoming the development trend of the automobile industry. NEVs integrate new energy, new materials, the Internet, Big Data, Artificial Intelligence (AI) and other transformative technologies, promote the transformation of automobiles from simple transportation tools to mobile intelligent terminals, energy storage units and digital space, drive the transformation and upgrading of energy, transportation, information and communication infrastructure, promote the optimization of the energy consumption structure, transportation system and intelligent urban operation, and contribute to the construction of a clean and beautiful world and the building of a community of shared future for all mankind. In recent years, the world's major automobile powers have strengthened strategic planning and policy support, while multinational automobile enterprises have increased investment in research and development (R&D) and perfected the industrial layout, making NEVs the main direction for the transformation and development of the global automobile industry and an important engine for the sustained growth of the global economy.

Section II. China's NEVs have entered a new stage of accelerated development

Profound changes are taking place in automobile products transportation mode, energy consumption structure and the way the society operates, providing unprecedented development opportunities for the new energy automobile industry. After years of efforts, China's NEV industry has significantly improved its technical level, gradually perfected its industrial system, and greatly enhanced the competitiveness of its enterprises, with production, sales and retention ranking first in the world for five consecutive years since 2015, and the industry has entered a new stage of superimposed convergence and integrated development. We must seize the strategic opportunity, consolidate the

good momentum, give full play to the advantages of infrastructure, information and communications and other fields, constantly improve the industry's core competitiveness, and promote the high quality and sustainable development of the NEV industry.

Section III. Integration and openness become the new feature of NEV development

With the comprehensive change in power supply, production, consumption and use of automobiles, the NEV industry eco-system is evolving from a "chain relationship" between suppliers, OEMs and marketing and service enterprises, to a "network eco-system" between the automobile industry, and the energy, transportation, information and communication sectors among others.. Mutual empowerment and integrated development have become the inherent need of all market players to thrive. Cross-industry and cross-domain integration and innovation, as well as more open and inclusive international cooperation, have become the characteristics of the times for the development of the NEV industry, greatly enhancing the momentum of industrial development, stimulating market vitality and promoting the formation of a new pattern of industrial development of mutual integration and symbiosis and win-win cooperation.

Chapter II Overall deployment

Section I. General ideas

Under the guidance of *Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era*, we adhere to the development concept of innovation, coordination, green development, openness and sharing. With the deepening of the supply-side structural reform as the main task, we stick to the direction of electric, network-connected and intelligent development, and rigorously implement the national strategy for the development of NEVs. With a focus on integration and innovation, we aim to make breakthroughs in key core technologies, improve industrial infrastructure capacity, build a new industrial eco-system, improve the infrastructure system, and optimize the industrial development environment, so as to promote the high-quality and sustainable development of China's NEV industry, and accelerate the construction of an automobile powerhouse.

Section II. Basic Principles

Market-oriented. Give full play to the decisive role of the market in the allocation of resources, strengthen the main role of enterprises in the selection of technology routes, production and service system construction; play a better role of the government in strategic planning and guidance, standards and regulations development, quality and safety supervision, market order maintenance, and green consumer guidance, etc., in order to create a favorable environment for industrial development.

Innovation-driven. Deepen the implementation of the innovation-driven development strategy, establish an enterprise-centered, market-oriented and industry-institution-research-application collaborative technological innovation system, improve the institutional environment that stimulates and protects innovation, encourage the parallel development of various technological routes, support stakeholders from all sides to work together to overcome difficulties in key core technologies, strengthen business model innovation, and create a new type of industrial innovation eco-system.

Coordinated promotion. China will improve the coordination mechanism of horizontal coordination and vertical integration, promote the deep integration of NEVs with energy, transportation, information and communications, and coordinate technical R&D, standard

formulation, promotion and application, and infrastructure construction, so as to turn advantages of a massive market into industrial advantages.

Open development. China will practice the concept of cooperation based on openness, inclusion and mutual benefit and win-win cooperation, expand the opening up to the world at a higher level, and promote reform, development and innovation with openness; China will adhere to the combination of "bringing in" and "going out", strengthen international cooperation, actively participate in international competition, cultivate new advantages in the automotive industry, so as to realize deep integration into the global industry chain and value chain system.

Section III. Vision for development

By 2025, China's NEV market will be significantly more competitive, with major breakthroughs in key technologies such as traction batteries, motor and vehicle operating systems, and an overall improvement in safety standards. The average power consumption of new pure electric passenger cars will be reduced to 12.0 kWh/100 km, NEV sales will reach about 20% of total new car sales, highly automated driving vehicles will be commercialized in limited areas and specific scenarios, and the convenience of charging and battery swapping services will be significantly improved.

It is expected that with another 15 years of continuous efforts, the core technology of NEVs in China will reach the international advanced level, and the quality of brands will have strong international competitiveness. Pure electric vehicles will become the majority of new vehicles sold, public sector vehicles will be fully electrified, fuel cell vehicles will be commercialized, highly automated vehicles will be adopted on large scale, the charging and battery swapping service network will be convenient and efficient, and the construction of the hydrogen fuel supply system will be steadily advanced, which will effectively promote energy conservation and emission reduction and improve the efficiency of the society.

Chapter III Improving technological innovation capacity

Section I. Deepening the "three verticals and three horizontals" R&D layout

Strengthen vehicle integration technology innovation. With pure electric vehicles, plug-in hybrid (including supercharged) vehicles and fuel cell vehicles as the "three verticals", the whole vehicle technology innovation chain will be laid out. China will research and develop a new generation of modular high-performance vehicle platform, conduct research on integrated design of pure electric vehicle chassis and multi-energy power system integration technology, make breakthrough in common energy-saving technologies such as intelligent energy management and control, light weight and low friction resistance, improve safety technologies such as battery management, charging connection and structural design, and improve the overall performance of NEVs.

Improve the basic capabilities of the industry. Take traction battery and management system, drive motor and power electronics, network connection and intelligent technology as the "three horizontals", China will build key component technology supply system, carry out technical research on advanced modular traction battery and fuel cell systems, explore new-generation motor drive system solutions for vehicles, strengthen the development of key components and systems for smart grid-connected vehicles, break through bottlenecks in computing and control platform technologies and hydrogen fuel cell vehicle application support technologies, and enhance R&D capabilities in basic key technologies, advanced basic processes, basic core components and key basic materials.

Column 1: NEV core technology project

Implementation of battery technology breakthroughs. Conduct research on key core technologies such as anode materials, electrolyte, diaphragm, membrane electrode, etc., work harder to make breakthroughs in lightweight, high-safety, low-cost and long-life traction battery and fuel cell system technologies, and accelerate the research, development and industrialization of solid-state traction battery technologies.

Implementation of intelligent network connection technology innovation project. Take NEVs as the carrier of the first

application of intelligent network connection technology, support cross-border cooperation of enterprises, conduct research and development on complex environment fusion perception, intelligent network connection decision-making and control, information physical system structure design and other key technologies, make breakthroughs in intelligent computing platforms, high-precision maps and positioning, wireless communication between vehicles and other devices outside the vehicle (V2X), wire control executive system and other core technologies and products.

Implementation of NEV basic technology improvement project. Make breakthroughs in key technologies and products such as vehicle-standard chips, vehicle operating systems, new electronic and electrical architectures, and efficient high-density drive motor systems, as well as hydrogen fuel cell vehicle application support technologies such as hydrogen energy storage and transportation, hydrogen refueling stations, and on-board hydrogen storage. Support basic components, key production equipment, high-end test instruments, development tools, high-performance automatic testing equipment and other basic common technology R&D and innovation, R&D of NEV intelligent manufacturing massive heterogeneous data organization and analysis, reconfigurable flexible manufacturing system integration and control and other key technologies, carry out high-performance aluminum-magnesium alloy, fiber-reinforced composite materials, low-cost rare earth permanent magnet materials and other key material industrial applications.

Section II. Accelerating the construction of a common technological innovation platform

Establish and improve the joint R&D mechanism among leading enterprises, national key laboratories and national manufacturing innovation centers, focus on weaknesses such as core processes, special materials, key components and manufacturing equipment, and actively explore different technological paths to improve the supply capacity of key common technologies. China will guide the cross-domain cooperation among automobile, energy, transportation, information and communication, establish an integrated innovation platform for NEVs, smart energy and intelligent transportation for future travel, jointly focus on basic cross-cutting key technologies, and enhance the integrated innovation capability of NEVs and related industries.

Section III. Enhancing the public service capacity of the industry

Rely on industry associations, innovation centers and other institutions to promote

the joint construction and sharing of various innovation service platforms, and improve the public service support capacity of technology transfer, information services, personnel training, project financing, international exchange and other public services. Apply virtual reality (VR), Big Data, AI and other technologies to establish a virtual simulation and test and verification platform for automotive electrification, network connectivity and intelligent development, and improve the measurement and testing, performance evaluation and testing and certification capabilities of whole vehicles and key components.

Chapter IV Building a new industrial eco-system

Section I. Support for ecosystem-oriented enterprise development

Encourage cross-border collaboration among enterprises in the fields of NEVs, energy, transportation, information and communications, etc., to build ecosystem-oriented enterprises covering key links of the industrial chain, such as solutions, R&D, production, operation and service, through open cooperation and benefit sharing, focusing on diversified production and diversified application needs. In regions with a good industrial base and a concentration of elements for innovation, the leading enterprises will play a crucial role in fostering a number of upstream and downstream collaborative innovation, integration and development of large, medium and small enterprises, NEV industry clusters with international influence and competitiveness, and enhancing the modernization level of the industrial chain.

Section II. Promoting the innovative application of key systems

Accelerate the development and application of automotive operating systems. Taking the needs of vehicle enterprises as a guide, China will give full play to the role of leading enterprises, the national manufacturing innovation center and other innovation platforms, and insist on collaborative research and development of software and hardware to focus on the development of automotive operating systems. Around the automotive operating system, China will build a development and application eco-system of in-depth cooperation among market players in the fields of vehicle, key components, basic data and software. Through rapid product iteration, expand the user base and accelerate the industrialization and application of the automotive operating system.

Column 2: Actions to Build Automotive operating Ecosystem

To meet the demand for intelligent application of NEVs, enterprises in the fields of vehicle and components, Internet, electronic information, communications and other fields are encouraged to form alliances, with the development and application of vehicle operating systems as the core, to improve the safety, reliability and convenience of operating systems and applications through iterative upgrades, to expand the application scale, and to form a sound eco-system of open sharing and collaborative evolution.

Promote the development of the whole value chain of traction batteries.

Encourage enterprises to improve their ability to secure key resources such as lithium, nickel, cobalt and platinum. Establish and improve the modular traction battery standard system, accelerate breakthroughs in key manufacturing equipment, and improve process levels and production efficiency. Improve the recycling system for traction battery, cascade utilization and re-resourcing, and encourage the sharing of recycling channels. Establish and improve the management system of traction battery transportation and storage, repair and maintenance, safety inspection, decommission and exit, recycling and other aspects, and strengthen the supervision of the whole life cycle.

Column 3: Building an efficient recycling system for power batteries

China will take into account the sustainable development of NEVs, implement the extended producer responsibility system, strengthen the construction of a traction battery traceability management platform for NEVs, and realize the traceability of the entire life cycle of power batteries. China will support the innovative application of traction battery gradient products in the fields of energy storage, energy reserve, charging and battery swapping, and strengthen research and development of technologies for residual energy detection, residual value assessment, reorganization and utilization, and safety management. China will optimize the layout of the recycling industry, promote the efficient extraction of valuable elements from end-of-life traction batteries, and promote industrial resource recycling and regeneration, and high value-added and green development.

Section III. Improving intelligent manufacturing

Promote the in-depth application of intelligent technology in new-energy vehicle R&D and design, manufacturing, warehousing and logistics, business management, after-sales service and other key processes. Accelerate the development and integration of core industrial software such as simulation, management and control of intelligent manufacturing of new energy vehicles, and carry out application demonstrations of intelligent factories and digital workshops. Accelerate the application of collaborative product lifecycle management system, support the construction of an integrated demonstration platform for design, manufacturing and service, and enhance the intelligence level of the whole industry chain of NEVs.

Section IV. Strengthening quality and safety assurance

Promoting quality brand building. Carry out actions to improve the quality of NEV products, guide enterprises to strengthen the design, manufacturing, testing and verification of the whole process of reliability technology development and application, make full use of the Internet, Big Data, Blockchain and other advanced technologies, and improve the quality control and traceability mechanisms throughout the product life cycle. Guide enterprises to strengthen their brand development strategies and enhance brand building with emphasis on improving quality and service levels.

Improve the safety and security system. Implement the safety production mechanism that combines enterprise responsibility, government supervision, industry self-discipline and social supervision. Strengthen the main responsibility of enterprises for product safety, implement the extended producer responsibility system, and strengthen the quality and safety management, safety status monitoring and maintenance testing of key systems such as whole vehicles, power batteries and electronic control. Improve the safety standards and regulations of NEVs, parts and components, as well as maintenance testing, charging and battery swapping, and strengthen the supervision and management of production safety and NEV safety recall management. Industry organizations are encouraged to strengthen technical exchanges, compile and summarize experiences, and guide enterprises to continuously improve their safety levels.

Chapter V Promoting industrial integration and development

Section I. Promoting the integration of NEVs and energy

Strengthen the interaction between new energy vehicles and power grid (V2G) energy. Strengthen research on high-cycle life cycle traction battery technology and promote the application of low-power DC technology. Encourage local Vehicle-to-Grid (V2G) demonstration applications, integrated NEV charging and discharging, power dispatch needs, coordination of electricity rates at peak and valley periods, NEV charging concessions and other policies to achieve efficient interaction between new energy vehicles and the grid energy, reduce NEV electricity costs, improve the grid peak frequency regulation, security and emergency response capabilities.

Promote efficient coordination between NEVs and renewable energy. Promote information sharing and integration of NEVs with meteorological and renewable energy power forecasting and prediction systems, coordinate the energy use of NEVs with wind power generation, photovoltaic power generation collaborative scheduling, and increase the proportion of renewable energy applications. Encourage the construction of "optical storage and charging and discharging" (distributed photovoltaic power generation - energy storage system - charging and discharging) multifunctional integrated station. Support the commercialization of fuel cell vehicles in areas with favorable conditions.

Section II. Promoting the integrated development of NEVs and transportation

Develop integrated intelligent travel services. Accelerate the construction of a new type of intelligent traffic control system covering front-end information collection, edge distributed computing and cloud-based collaborative control. Accelerate the application of NEVs in the fields of time-sharing, urban public transportation, rental cars and site vehicles, and optimize the environment for the adoption and use of NEVs in public services. Guide automobile production enterprises and travel service enterprises to build a "one-stop" service platform, and promote the development and application of automatic valet parking technology.

Build an intelligent green logistics and transportation system. Promote the application of NEVs in urban distribution, port operations and other fields, and provide convenience for new energy trucks. Develop "Internet +" efficient logistics, innovate intelligent logistics operation mode, promote network freight, trailer sharing and other new mode applications, and create a safe and efficient logistics and transportation services new business format.

Section III. Promoting the integrated development of NEVs and information and communications technology (ICT)

Promote efficient collaboration of "people, vehicles, roads and clouds" with data as the link. Based on vehicle perception, traffic control, city management and other information, build a " people, vehicles, roads and clouds " multi-layer data fusion and computing and processing platform, carry out demonstration applications in specific scenarios, regions and roads, and promote new energy vehicles. Application service innovation with information and communication convergence.

Create a network security guarantee system. Improve the NEV network security management system, build a unified automotive identity authentication and security trust system, promote the in-depth application of cryptographic technology, strengthen the vehicle information system, service platform and key electronic parts security testing, strengthen the NEV data classification and classification and compliance application management, improve risk assessment, early warning monitoring, emergency response mechanism, to protect the information security of all parts along the "vehicle-transmission pipe network-cloud" chain.

Section IV. Strengthening standard alignment and data sharing

Establish a comprehensive standard system for the integration and development of NEVs and related industries, and clarify the technical interface standards for vehicle operating systems, vehicle base maps, vehicle pile information sharing, and cloud control infrastructure platforms. Establish a cross-industry and cross-domain comprehensive Big Data platform to promote the common construction, sharing and interoperability of all kinds of data.

Column 4: NEV Application Demonstration Action for Smart Cities

Conduct comprehensive demonstrations of intelligent and orderly charging, integration and development of NEVs and renewable energy, urban infrastructure and intercity intelligent transportation,

and integration of heterogeneous multi-modal communication networks, and support urban driverless logistics and distribution, municipal sanitation, Bus Rapid Transit system (BRT), automatic valet parking and specific scenario demonstration applications carried by smart grid-connected vehicles.

Chapter VI Improving infrastructure system

Section I. Promoting the construction of an electricity charging and battery swapping network

Accelerate the construction of power charging and battery swapping infrastructure. Scientific layout of power charging and battery swapping infrastructure, strengthening coordination with urban and rural construction planning, power grid planning, property management and urban parking. Relying on the "Internet +" smart energy, enhance the intelligent level, actively promote intelligent and orderly slow-charging service mode, supplemented by emergency fast-charging service mode of residential charging, accelerate the formation of a moderately advanced, fast-charging-based, slow-charging-supplemented highway and urban and rural public charging network, encourage the application of battery swapping mode, strengthen intelligent and orderly charging, and promote the development of the power-changing infrastructure. High-power charging, wireless charging and other new charging technology research and development, and improve the convenience of charging and product reliability.

Improve the service level of charging infrastructure. Guiding enterprises to jointly establish charging facility operation and service platforms to achieve interoperability, information sharing and unified billing. Strengthen the research and development of charging equipment and power distribution system safety monitoring and warning technology, regulate the use of electromagnetic spectrum of wireless charging facilities, improve the safety, consistency and reliability of charging facilities, and enhance the level of service guarantee.

Encourage business model innovation. Combined with the transformation of old neighborhoods, urban renewal, etc., guide the joint construction and operation of charging facilities for multiple parties, and support the development of cooperative models such as multi-car, one-pile and shared parking spaces near residential areas. Encourage the combination of charging stations and commercial real estate, the construction of integrated parking charging service facilities, improve the ability of public charging service, and expand value-added services. The insurance system for charging facilities should be improved to reduce the risk of enterprise operation and user usage.

Section II. Coordinating and promoting the construction of smart road network facilities

Promote the construction of a new generation of wireless communication networks, and accelerate the formulation of standards and technical upgrades for wireless communication (C-V2X) between vehicles and other devices outside vehicles based on cellular communication technology. Transform and upgrade the digital traffic signs and other road infrastructure, strengthen the intelligent interconnection between traffic lights, traffic signs and markings, communication facilities, intelligent roadside equipment and vehicle-mounted terminals, and promote the formulation of standards and the construction of management platforms related to the intelligent construction and transformation of urban road infrastructure. Accelerate the construction of differential base stations, and promote the application of Beidou and other satellite navigation systems in the field of high-precision positioning.

Section III. Promoting the construction of hydrogen fuel supply system in an orderly manner

Improving the economics of hydrogen fuel production, storage and transportation. According to local conditions, the application of industrial by-product hydrogen and renewable energy-based hydrogen production technologies should be carried out, and the industrialization of advanced and suitable hydrogen storage materials should be accelerated. China will also carry out the demonstration and application of high-pressure gaseous, cryogenic gaseous, low-temperature liquid and solid storage and transportation technologies, explore the construction of hydrogen fuel transportation pipelines, and gradually reduce the cost of hydrogen fuel storage and transportation. Improve the standard system of hydrogen fuel production, storage, transportation and refueling. Strengthen the research on the safety of hydrogen fuel and enhance the safety supervision of the whole chain.

Promote the construction of hydrogen refueling infrastructure. Establish and improve the management norms of hydrogen refueling infrastructure. Guide enterprises to reasonably arrange hydrogen refueling infrastructure according to hydrogen fuel supply and consumption demand, and improve the safety operation level. Support the use of existing sites and facilities to develop comprehensive oil, gas, hydrogen and electricity supply services.

Column 5: Building intelligent infrastructure service platform

Coordinate the formulation and revision of standards for power charging and

battery swapping technology and interfaces, hydrogenation technology and interfaces, automotive hydrogen storage devices, automotive communication protocols, intelligent road construction, data transmission and settlement, and building a standard system for infrastructure interoperability. Guide enterprises to build service platforms such as intelligent infrastructure, high-precision dynamic maps, cloud-controlled basic data, and carry out pilot demonstrations of integrated services such as power charging and battery swapping, hydrogenation and intelligent transportation to realize infrastructure interconnection and interoperability and intelligent management.

Chapter VII Deepening openness and cooperation

Section I. Expanding openness and exchange cooperation

China will strengthen its alignment with the prevailing international economic and trade rules, fully implement the system of pre-entry national treatment and negative list management, treat new energy market players equally, and build a market-oriented, rule-of-law and international business environment. China will make full use of multilateral and bilateral cooperation mechanisms and high-level dialogue mechanisms, and support domestic and foreign enterprises, research institutes and industrial organizations to carry out exchanges and cooperation in such fields as R&D, trade and investment, infrastructure, technical standards and personnel training. China will actively participate in the formulation of international rules and standards, promote the formation of an open, transparent and inclusive international market environment for NEVs, create a new platform for international cooperation and add new momentum for common development.

Section II. Accelerating integration into the global value chain

Guiding enterprises in formulating international development strategies, continuously improving their international competitiveness, intensifying their efforts to explore international markets, and promoting the extension of industrial cooperation from production and manufacturing to the whole chain of technological research and development, marketing and so on. Encourage enterprises to make full use of domestic and foreign funds to establish an international consumer credit system. Support enterprises to establish international marketing service networks, and build service platforms such as overseas warehouses and after-sales service centers in key markets. Improve legal advice, testing and certification, personnel training and other service guarantee systems, and guide enterprises to standardize overseas business practices and improve compliance management.

Chapter VIII Safeguard Measures

Section I. Deepening industry regulatory reform

China will further promote the reform of streamlining administration and delegating power, implement inclusive and prudent supervision, and promote the healthy and orderly development of new industries and new models. China will improve the parallel management methods for the average fuel consumption of enterprises and points for NEVs, effectively take over financial subsidy policies, and study the establishment of a mechanism to link up with the carbon trading market. Strengthen the supervision during and after the event, consolidate the local main responsibility, and curb the blind launch of NEV manufacturing projects and other chaos. China will promote the improvement of regulations related to the production and management of road vehicles, establish a sound exit mechanism for zombie enterprises, strengthen supervision and inspection of enterprises to maintain access conditions, and promote the survival of the fittest. Give full play to the role of market mechanisms, support the mergers and reorganization of advantageous enterprises, bigger and stronger, and further improve industrial concentration.

Section II. Improving the system of policies and regulations

Implementing preferential tax policies related to NEVs, and optimizing categorizedtransport management and financial services. China will promote the scientific layout and speed up the construction of infrastructure for power charging, battery swapping and hydrogenation, and will provide financial support for the construction of charging piles as public facilities. Break local protection and establish a unified open and fair market system. Encourage local governments to increase support for public services, shared travel and other areas of vehicle operation, provide NEV parking, charging and other preferential policies. By 2021, in National Pilot Zones for Ecological Conservation and key regions for the prevention and control of air pollution[3], among newly added or upgraded vehicles for public transportation such as buses, taxis, logistics and distribution vehicles, NEVs should account for no less than 80%. Formulate specific measures to include investment in R&D of NEVs into the

[3] (Beijing, Tianjin and Hebei (Jing-Jin-Ji), Shanghai, Shanxi, Jiangsu, Zhejiang, Shandong, Guangdong and Hainan) (added by authors)

assessment system of state-owned enterprises. Accelerate the improvement of policies and regulations on road traffic, accident liability, and data use that meet the requirements of the development of smart grid-connected vehicles. Accelerate the promotion of traction battery recycling legislation.

Section III. Strengthening human resources development

Accelerate the establishment of a capacity building mechanism to meet the needs of the integrated development of NEVs and related industries, compile a catalogue of talents that are in short supply in the industry, optimize the layout of disciplines in the field of automotive electrification, network connectivity and intelligent development, and guide institutions of higher learning, research institutes and enterprises to increase the introduction and training of international talent. Promote entrepreneurship and craftsmanship, establish positive incentive orientation, and implement diversified incentive measures such as granting equity and options.

Section IV. Strengthening Intellectual Property Protection

Deepen the implementation of the national intellectual property strategy, and encourage researchers to develop high-value core intellectual property achievements in the field of NEVs. Strictly enforce the intellectual property protection system, and increase the enforcement of law against infringement. Build a NEV intellectual property operation service system, strengthen the construction of patent application transformation platform, and establish a mutually beneficial and win-win patent operation mode.

Section V. Strengthening Organizational Coordination

Give full play to the inter-ministerial joint committee system and local coordination mechanism for the development of energy conservation and new energy vehicle industry, strengthen departmental coordination and top-down linkage, formulate annual work plans and departmental task division, strengthen the coordination between NEV and energy, transportation, information and communication industries in terms of policy planning, standards and regulations, etc., and pay close attention to the major tasks and key work identified in the plan. The relevant departments should focus on the planning objectives and tasks, according to the division of functions to develop the departmental work plan and supporting policy measures. Each region should make practical implementation according to local conditions, optimize

industrial layout and avoid duplicate construction. Industry organizations should give full play to the role of a bridge connecting enterprises and the government, and coordinate the formation of industry cross-border exchange and collaboration platform. The Ministry of Industry and Information Technology (MIIT), together with relevant departments, should conduct in-depth research, strengthen follow-up and guidance, and promote the smooth implementation of the plan.

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