Translation	

The following document, issued by China's State Council in November 2016, describes in great detail the PRC government's five-year (2016-2020) industrial development strategy for emerging technology. It defines a vast array of new technologies as "strategic" and in many cases sets quantifiable goalposts for the growth of certain high-tech industries. An appendix identifies the specific Chinese ministries responsible for carrying out this plan for each type of emerging technology.

Title
Circular of the State Council on Issuing the National 13th Five-Year Plan for the Development of Strategic Emerging Industries
国务院关于印发"十三五"国家战略性新兴产业发展规划的通知

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To the people's governments of all provinces, autonomous regions, and municipalities, ministries and commissions of the State Council, and their respective agencies:

The National 13th Five-Year Plan for the Development of Strategic Emerging Industries is hereby printed and distributed. Please implement it meticulously.

State Council
November 29, 2016

(This circular is released publicly)

13th National Five-Year Plan for the Development of Strategic Emerging Industries

Strategic emerging industries represent a new round of scientific and technological change and the direction of industrial transformation. They are key areas for the cultivation of new kinetic energy and are critical to gaining new competitive advantages in the future. During the 13th Five-Year Plan period, strategic emerging industries must be placed in a more prominent

position in economic and social development, and a new modern industrial system must be rigorously built to promote sustained and healthy economic and social development. This plan has been prepared in accordance with the relevant arrangements for the overall 13th Five-Year Plan, and the planning period is 2016-2020.

1. Accelerate the expansion of strategic emerging industries and create a new engine for economic and social development

(1) Current status and overall situation:

During the 12th Five-Year Plan period, the country witnessed the rapid development of strategic emerging industries such as energy conservation and environmental protection, next-generation information technology, biology, high-end equipment manufacturing, new energy, new materials, and new energy vehicles. In 2015, the added value of strategic emerging industries accounted for about 8% of GDP, and industrial innovation and profitability improved significantly. The competitiveness of a group of enterprises in the fields of information technology, biology, and new energy has placed them at the forefront of the international market. Breakthroughs have been achieved in the international development of high-speed rail, communications, aerospace equipment, and nuclear power equipment. A number of emerging industrial clusters with an output value of more than 100 billion yuan have strongly supported the transformation and upgrading of regional economies. Widespread entrepreneurship and innovation have flourished, and strategic emerging industries have been widely integrated into society, accelerating the transformation and upgrading of traditional industries. A large number of new technologies, new products, new formats, and new models have emerged, creating a large number of jobs and becoming a major support in stabilizing growth, promoting reform, implementing structural changes, and supporting the people's livelihoods.

The next five to ten years will be a crucial period for the launch of a new round of global technological change and industrial transformation. The information revolution continues to evolve rapidly. The Internet of Things, cloud computing, big data, artificial intelligence, and other technologies cover a broad spectrum of fields, and the prosperity of the information economy has become an important symbol of national strength. Major breakthroughs have been made in technologies such as additive manufacturing (3D printing), robotics and smart manufacturing, metamaterials and nanomaterials, promoting the differentiation and transformation of traditional industrial systems and reshaping the international division of labor in manufacturing. Genomics and its associated technologies are developing rapidly. New models, such as precision medicine, biosynthesis, and industrialized breeding are accelerating and expanding. The new biotech economy is expected to lead to new horizons for human production and life. Responding to global climate change to promote the tide of green and low-carbon development, the scale of application of cleaner production technology continues to expand, and the new energy revolution is changing the existing international resource and energy layout. Digital technology has become deeply integrated with cultural creativity and design services. The digital creative industry has gradually become an intellectually intensive industry that promotes the effective supply of quality products and services. The creative economy is emerging as a new development model. Innovation-driven emerging industries have gradually become the main driving force for global economic recovery and growth,

triggering an international division of labor and restructuring of international trade, and the development of the global innovation economy has entered a new era.

The 13th Five-Year Plan period is a decisive stage for China to form a well-off society in an all-round way (全面建成小康社会), and it is also a promising strategic opportunity for strategic emerging industries. The systems and mechanisms required to drive innovation in China have become more perfect, the allocation of talent, technology, capital, and other factors continues to be optimized, the upgrading of emerging consumption is accelerating, investment demand for emerging industries is strong, the internationalization of some fields is accelerating, the industrial system is gradually becoming more complete, and the market space is increasingly broad. However, it can also be seen that the overall level of innovation in China's strategic emerging industries is still not high. Some areas of core technology are still subject to human constraints. Some reform measures and policy measures have yet to be implemented. The innovation of new industry supervision methods and the construction of the legal system are relatively lagging and still fail to meet the requirements for economic development. New and old kinetic energy must accelerate this transformation and accelerate the upgrading of industrial structure. It is of urgent importance that overall planning and policy support be strengthened to create a comprehensive environment that is conducive to the vigorous development of emerging industries, innovative ideas on development, an enhancement in the quality of development, and the acceleration of development and growth. The promotion of emerging pillar industries and the promotion of strategic emerging industries have become a powerful driving force for economic and social development.

(2) Guiding ideology:

Fully implement the spirit of the 18th Party Congress and the 3rd, 4th, 5th, and 6th plenums of the 18th CPC Central Committee. Thoroughly study and implement the spirit of General Secretary Xi Jinping's series of important speeches. Conscientiously implement the decisions and arrangements of the Party Central Committee and the State Council, in accordance with the requirements of the "Five-in-One" [economic, political, cultural, social, and ecological civilization development] overall arrangements (“五位一体”总体布局) and the "Four Comprehensivelys" [comprehensively form a well-off society, comprehensively deepen reform, comprehensively govern the country according to law, comprehensively govern the party strictly] strategic arrangement (“四个全面”战略布局). Actively adapt to change to grasp and lead the new normal of economic development, firmly establish and implement the development concepts of innovation, coordination, greenness, openness, and sharing, and firmly grasp the new round of global technological revolution and major opportunities for industrial transformation. Foster a new development momentum and promote structural reforms on the supply side. Build a modern industrial system and enhance innovation capabilities. Deepen international cooperation and further develop and grow a new generation of information technology, high-end equipment, new materials, biology, and new energy vehicles. Promote the vigorous development of new technologies, new products, new formats, and new models in a wider field in strategic emerging industries such as new energy, energy conservation and environmental protection, and digital creativity. Build a manufacturing superpower (制造强国), develop modern service industries, and provide strong support for building a well-off society in an all-round way.

(3) Main principles:

Promote supply innovation. Innovation is at the heart of the development of strategic emerging industries. Deepen the implementation of the innovation-driven development strategy, rigorously promote widespread entrepreneurship and innovation, highlight the main position of enterprises in development, comprehensively improve the supply level of technology, talent, and capital, and create an environment in which the elements of innovation are interactively integrated. Focus on achieving breakthroughs in core key technologies, further enhance our capacity for independent innovation, and comprehensively enhance the added value and international competitiveness of products and services. Promote streamlined governance and delegation of power (简政放权), integrate management, optimize service reform, break past the constraints of traditional management systems on the development of emerging industries, reduce enterprise costs, stimulate the vitality of enterprises, and accelerate the growth of emerging enterprises.

Continue to lead demand. Market demand is a key factor driving the growth of strategic emerging industries. Strengthen demand-side policy guidance, accelerate the application and demonstration of new products and services, convert potential demand into actual supply, and promote industrial upgrades through consumption upgrades. Create a fair competitive market environment and stimulate market vitality.

Continue to consolidate industries. Intensive agglomeration serves as a basic model for the development of strategic emerging industries. Take technological innovation as a starting point to accelerate development strategies for strategic emerging industry growth and enhance the sustainable development capabilities and international competitiveness of industrial clusters. Use coordinated development of the supply chain and the innovation chain as a means of cultivating new formats and new models, develop distinctive industrial clusters, and promote regional economic transformations to form a new pattern of innovative economic agglomeration and development.

Continue to prosper through talent. Talent is the primary source of development and growth of strategic emerging industries. Accelerate the development of talent growth policies and institutional innovations and ensure that talented people are enumerated based on their knowledge, skills, management, and other innovative factors. Value talented people for their market value and fully stimulate the innovation and vitality of entrepreneurship. Intensify efforts to cultivate and attract all kinds of talented people and promote a spirit of craftsmanship and entrepreneurship.

Continue to promote open integration. Open integration is an objective requirement for accelerating the development of strategic emerging industries. Build an international innovation and collaboration platform with a more open and inclusive approach. Make efficient use of global innovation resources and rigorously promote the international application of technologies and standards that China is strong in (我国优势技术和标准). Accelerate the global allocation of supply chains, innovation chains, and value chains. Comprehensively enhance the development capabilities of strategic emerging industries.

(4) Development goals:

By 2020, the development of strategic emerging industries must achieve the following goals:

The scale of the industry must continue to grow and become a new driving force for economic and social development. The added value of strategic emerging industries must account for 15% of GDP, forming the five new pillar industries of information technology, high-end manufacturing, biotech industry, green and low-carbon industry, and digital and creative industry, each with output values of over 10 trillion yuan. Form new growth points in a wide range of fields for large-scale cross-border integration with average annual job growth of over one million new jobs.

Innovation capabilities and competitiveness must be significantly improved, forming a new high ground for global industrial development. A number of key core technologies must come to the fore, the annual growth rate for invention patents must reach over 15%, and a number of major industrial technology innovation platforms must be built. Industry innovation capabilities must rank first globally, forming first-mover advantages in several major sectors. Product quality must also improve significantly. The accessibility of new products and services in the fields of energy conservation, environmental protection, new energy, and biology must increase significantly. Intellectual property protection must be more stringent, and policies and regulations that encourage innovation must be more robust.

The industrial structure must be further optimized to form a new industrial system. Continue to develop a number of industry leaders with strong originality, international influence, and brand reputation and rigorously and courageously develop new small and medium-sized enterprises. Significantly increase the proportion of high-end manufacturing and knowledge-intensive service industries and support these industries as they move towards the mid to-high-end level. Form a number of strategic emerging industry development strategies and technological innovation centers with global influence and create over 100 emerging industrial clusters with distinctive characteristics and strong innovation capabilities.

By 2030, the development of strategic emerging industries must become a leading force for the sustained and healthy development of China's economy. China must become an important manufacturing center and innovation center for strategic emerging industries in the world, and a group of innovative leading enterprises with global influence and leading positions must be formed.

(5) Overall arrangements:

Focus on innovation, growth and leadership, closely integrating the implementation of the "Made in China 2025" strategy, adhering to the path of innovation-driven development, promoting a number of emerging areas to grow and become pillar industries, and continuing to lead industries in high-end development and high-quality economic and social development. Based on development needs and industrial bases, greatly increase the technological content of industries, accelerate the development and expansion of the five major sectors of the network economy, high-end manufacturing, biotech industry, green and low-carbon industry, and the digital and creative industries, and realize a leap forward to the innovation economy. Focus on the new trends and directions of the new round of global scientific and technological revolution and industrial transformation, set aside a number of strategic industries in the fields of

aerospace and maritime, information networking, biotechnology, and nuclear technology to create new advantages for future development. Following the basic practices of development of strategic emerging industries, highlight the advantages and characteristics of industries and creating a number of strategic emerging industry development sources, agglomeration areas, and distinctive industrial clusters to form new patterns of regional growth. Grasp the strategic opportunity to promote the construction of the "Belt and Road" [the Silk Road Economic Belt and the 21st Century Maritime Silk Road], use global innovation resources with a more open outlook, and enhance the internationalization of strategic emerging industries. Accelerate the reform of key areas and key links, continuously improve policies and measures conducive to the convergence of technology, capital, and talent, create a fair competitive market environment, comprehensively create an ecological environment that adapts to new technologies and new formats, and accelerate the formation of a new drive for economic and social development.

2. Promote the development of the information technology industry and expand the new space of the network economy

Implement the strategy of strengthening the country with the internet, accelerate the construction of a "Digital China," and promote the integration of technologies such as the Internet of Things, cloud computing, and artificial intelligence into all industries. Build a next-generation secure, controllable information technology industry system that incorporates the Internet of Everything and interconnects innovation with smart synergies. By 2020, strive to achieve systematic breakthroughs in next-generation information technology industry weak links with a total output value of more than 12 trillion yuan.

(1) Build an infrastructure for the country to become an internet superpower (网络强国). Deepen the "Broadband China" strategy and accelerate the construction of a new generation of information infrastructure that is fast, mobile, secure, and ubiquitous.

Rigorously promote the construction of high-speed fiber optic networks. Pilot the scaled application of new smart network technologies and promote the upgrade of the national backbone network with high speeds, flexible scheduling, and smart adaptation. Fully realize the leap forward to an all-optical network, accelerate the coverage of optical networks in urban areas, provide access services of 1,000 megabits per second (1000 Mbps) or faster, and offer flexible choices for home users in large and medium-sized cities to achieve bandwidths above 100 Mbps. Promote rural fiber-optic broadband coverage through multi-party collaborations so that over 98% of administrative villages (行政村) achieve fiber access. Where conditions permit, provide access services of more than 100 Mbps in certain areas and help more than half of rural households achieve flexible bandwidths above 50 Mbps. Promote the development of network convergence (三网融合) infrastructure. Advance the upgrade and application of Internet Protocol version 6 (IPv6) and push backbone enterprises to add new network addresses without relying on private addresses.

Accelerate the construction of next-generation wireless broadband networks. Accelerate the construction of the fourth-generation mobile communication (4G) network to achieve deep coverage and wide-area continuous coverage of urban and population-dense administrative villages. Promote free high-speed wireless LANs in hot spot areas. Rigorously promote the joint research and development, testing, and pre-commercial pilot of the fifth-generation mobile communication (5G) network. Optimize the allocation of national spectrum resources, improve

the efficiency of spectrum utilization, and ensure the supply of frequency resources. Rationally plan the use of satellite frequency and orbit resources, accelerate the deployment of satellite Internet, develop new communication satellites and application terminals, explore the construction of a space-earth integrated network (天地一体化信息网络), and study new ways of high-altitude coverage such as stratospheric communication.

Accelerate the construction of next-generation broadcast television networks. Promote smart synergistic coverage of cable, wireless, and satellite broadcast television networks and build a space ground integration network with integrated communications, broadband interaction, smart synergies, and controllable broadcast television convergence transmission coverage. Accelerate nationwide cable television network infrastructure construction and the bidirectional, intelligentized (智能化) upgrade and transformation of national cable television networks. Promote the research and development and industrialization of the next generation of terrestrial digital radio and television broadcasting transmission technology, strengthen the integration and innovation of terrestrial broadcast radio and television with the internet, and create a new format for mobile, interactive, and convenient terrestrial wireless broadcast radio and television.

Box 1: Broadband Rural Demonstration Project
Conduct pilot work on universal telecommunications services, promote network convergence, accelerate the construction of optical cables and satellite communications for administrative villages, and implement fiber-optic home-based networks and fourth-generation mobile communication (4G) networks to extend coverage to natural villages (自然村) and households on demand, using satellites and mobile communications. Technological innovations in fields such as communications will strengthen coverage to islands, remote areas, and mountainous regions, accelerate the popularization of e-commerce, distance education, telemedicine, smart agriculture, e-government, and other information applications, and support poverty alleviation.

Coordinate the development of application infrastructures. Make full use of existing facilities, plan the layout of large-scale and super-large data centers in suitable regions across the country, and promote the construction of green data centers in an orderly fashion. Promote Internet of Things intensive deployment based on existing communication networks. Continue to strengthen emergency communications capacity building.

Strengthen international collaboration. Strengthen international information network infrastructure interconnection and cooperation. Strengthen the construction of overseas submarine cables, land cables, service nodes, data centers, satellite communications, and the like and optimize the layout of international communication networks. Accelerate the construction of the China-Arab States Online Silk Road and the China-ASEAN Information Harbor.

(2) Promote the "Internet Plus" initiative. Promote the integration of next-generation information technology with all economic and social fields and foster an "Internet Plus" ecosystem.

Deepen the integrated application of the Internet in the production realm. Deepen the development of manufacturing and Internet convergence, promote "Made in China Plus

Internet" to achieve substantive breakthroughs, develop information technology services for manufacturing, build new foundations for manufacturing of core industrial hardware and software, industrial clouds, and intelligent service platforms, and rigorously promote smart manufacturing, new formats and new models such as networked collaboration, personalized customization, and service extension. Accelerate the development of the industrial Internet, build an industrial Internet system architecture, and carry out industrial Internet innovation application demonstrations. Promote the deep integration of the mobile internet, cloud computing, Internet of Things, and other technologies with agriculture, energy, finance, commerce, logistics, and express delivery. Support industry-oriented software development and system integration for network collaboration and promote the transformation of manufacturing to production services and production to extend the service industry to the high end of the value chain.

Expand "Internet Plus" applications in the lifestyle and public services fields. Accelerate the innovation of industry management systems and promote intelligentization of services such as healthcare, education, social security (社保), employment, transportation, and tourism. Expand the application of new smart cities, promote the innovation of Internet-based public service models, promote the construction of public platforms for cloud-based information services, and enhance the supply of public goods. Accelerate the implementation of "Internet Plus Government Services" and gradually realize the "one-number, one-window, one-network" system for government service applications, acceptance, and processing.

Promote innovation in the new business of "Internet Plus." Encourage the use of information network technology to promote the transformation of production, management, and marketing models, reshape the industrial chain, supply chain, and value chain, and accelerate the formation of new production and circulation exchange models. Promote the sharing of economic development through institutional innovation, establish a regulatory approach to adapt to the development of the sharing economy, promote the standardized development of shared platform enterprises in the fields of transportation, tourism, pensions, human resources, and daily necessities, and create a cultural atmosphere for the sharing economy.

Box 2: "Internet Plus" Project
Deeply promote "Internet Plus" in the 11 key initiatives of entrepreneurial innovation, collaborative manufacturing, modern agriculture, smart energy, inclusive finance, people-first services, efficient logistics, e-commerce, convenient transportation, green ecology, and artificial intelligence. Establish an internet services platform to support cross-domain integration and innovation. Promote cloud-based business models and business model innovation and promote the establishment of public cloud and industry cloud platforms. Strengthen research on the Internet of Things network architecture and organize demonstrations of major Internet of Things applications. Accelerate the commercial deployment of the next-generation internet and build a trial and error and management service platform for internet technology. Create a national information economy demonstration zone.

(3) Implement the national big data strategy. Implement the outline for the big data development initiative, comprehensively promote the efficient collection, effective integration, open sharing, and application expansion of big data in key areas, improve supervision and

management systems, strengthen security guarantees, and promote the innovation and development of related industries.

Accelerate the open sharing of data resources. Coordinate the layout and construction of the national public platform for big data, formulate and introduce open data sharing management methods, promote the establishment of data resource lists and open catalogs, and encourage the public to add value, public welfare, and innovative development to open data. Strengthen the construction of basic systems for big data, strengthen supervision on usage, establish and improve data resource trading and pricing mechanisms, and protect rights and interests related to data resources.

Develop new big data applications and formats. Accelerate the application of government big data, establish a national system for overall controls and social governance, and improve government governance capabilities. Develop the application of big data in industry, agriculture, and rural areas, entrepreneurial innovation, and job promotions, promote innovation in the data service industry, and promote the development of new formats and new models, such as big data mining, big data chemistry, big data materials, and big data pharmaceuticals. Strengthen the research and development of key technologies such as mass data storage, data cleaning, data analysis and mining, and data visualization and form a group of internationally competitive big data processing, analysis, and visualization software and hardware products, cultivate big data related industries, improve the supply chain, and promote related industrial agglomeration development. Promote the construction of a comprehensive database for big data.

Strengthen the security of big data and network information. Establish a big data security management system, formulate big data security management methods and related standards and regulations, and establish a cross-border mobile security safeguard for data. Strengthen key technologies such as data security and privacy protection to form a safe and reliable big data technology system. Establish and improve the network security review system. Use safe and reliable products and services to improve the safety and reliability of key infrastructure equipment. Establish a critical information infrastructure protection system to study key information systems and infrastructure network security solutions.

Box 3: Big Data Development Project
Integrate existing resources and build a government data-sharing exchange platform and open data platform. Improve the big data sharing and circulation system, the big data standards system, and the big data security system. Promote making government datasets on credit, transportation, medical care, education, the environment, security monitoring, and so forth available to the public. Support the research, development, and industrialization of key big data technologies, carry out big data demonstration applications in key areas, implement special projects for national information security, and promote the healthy and rapid development of industries related to big data.

(4) Strengthen the core industries of information technology. In line with networkization (网络化), intelligentization, integration, and other development trends, strive to cultivate a core ecosystem for application traction and open compatibility, comprehensively sort out and accelerate the development and industrialization of new technologies in key areas of

information technology, and promote breakthroughs in the transformation and upgrading of the electronic information industry.

Improve core infrastructure hardware supply capabilities. Enhance the level of key chip design and develop chips for new applications. Accelerate the industrialization of 16/14 nanometer production and the construction of memory production lines, improve the technical level and industrial concentration of the packaging and testing industry, and step up chip-adjacent fields in the late Moore's Law era (后摩尔定律时代). Realize breakthroughs in and the scaled application of active matrix organic light-emitting diode (AMOLED), ultra-high definition (4K/8K) quantum dot liquid crystal displays, flexible displays, and other technologies. Promote research, development, and industrialization of key technologies in smart sensors, power electronics (电力电子), printed electronics (印刷电子), semiconductor lighting, and inertial navigation and enhance the supply of new chip components, optical communication devices, and dedicated electronic materials.

Box 4: Integrated Circuit Development Project
Launch planning for a significant productivity layout for integrated circuits and implement a number of highly practical projects to promote rapid industrial growth. Accelerate the construction of advanced manufacturing processes, memories, and specialty processes and improve the design and development capabilities and application levels of key products such as safe and reliable CPUs, digital-analog/analog-to-digital conversion chips, and digital signal processing chips. Promote the rapid development of packaging, testing, key equipment, and materials industries. Support a boost in the level of service offered by original equipment manufacturers and third-party IP core enterprises, support collaborative innovation between design and manufacturing enterprises, and promote key industries to increase industrial concentration. Promote collaborative innovation in the semiconductor display supply chain.

Rigorously develop basic software and high-end information technology services. Establish a safe and reliable basic software product system for key industry needs and support the development of open source communities. Strengthen the development and application of operating systems in the fields of cloud computing, Internet of Things, industrial internet, and intelligent hardware. Accelerate the development of database systems for big data applications and middleware for industry application needs. Support the development of general-purpose software such as office software for network collaboration optimization. Strengthen the service capacity building of information technology core software and hardware systems, encourage domestic enterprises to develop high-end comprehensive system integration, standardize service delivery, and ensure service quality. Encourage the exploration of new cutting-edge technology-driven service formats and encourage key enterprises to accelerate program development and applications in industry solutions in emerging fields. Rigorously develop high-end software outsourcing based on new generation information technology.

Accelerate the development of high-end complete machine products (高端整机产品). Promote the research, development, and industrialization of information technology products such as green computing, trusted computing, and data and network security. Accelerate the innovation and application of high-performance secure servers, storage devices and industrial control products, new smartphones, next-generation network devices and data center equipment, advanced smart televisions and smart home systems, and information security

products. Develop professional terminals, equipment, and integrated innovation systems for industries such as finance, transportation, and healthcare. Rigorously improve product quality and cultivate a number of brands with international influence.

(5) Develop artificial intelligence. Cultivate an artificial intelligence industry ecosystem, promote the use and application of artificial intelligence in key economic and social fields, and build a leading international technology system.

Accelerate the construction of a support system for artificial intelligence. Promote basic theoretical and technical research such as brain-inspired (类脑) research, accelerate the research, development, and industrialization of application technologies, such as computer vision and hearing, biometrics (生物特征识别), new human-computer interaction, and intelligent decision control, and support basic hardware and software development in the field of artificial intelligence. Accelerate the construction of artificial intelligence mass training resources and basic resource service public platforms such as video, map, and industry application data applications, and build a new type of computing cluster that supports large-scale deep learning. Encourage leading companies or institutions to provide artificial intelligence research and development tools as well as innovative services such as inspection and assessments, entrepreneurial consulting, and talent development.

Promote the application of artificial intelligence technology in various fields. Pilot demonstrations in key areas such as manufacturing, education, environmental protection, transportation, commerce, healthcare, cybersecurity, and social governance to promote the scaled application of artificial intelligence. Develop diversified, personalized, and customized intelligent hardware and intelligent systems, focusing on the development and industrialization of smart homes, smart cars, smart agriculture, smart security, smart health, intelligent robots, and smart wearable devices. Encourage all industries to strengthen integration with artificial intelligence and gradually realize intelligent upgrades (智能化升级). Use artificial intelligence to innovate city management and build new smart cities. Promote the application of professional service robots and home service robots to foster new high-end service industries.

Box 5: Artificial Intelligence Innovation Project
Promote basic theoretical research and core technology development, realize the industrialization of human neuron-inspired computing chips (类人神经计算芯片), intelligent robots, and intelligent application systems, and embed new artificial intelligence technologies in various fields. Construct a public service platform for artificial intelligence and a backbone enterprise R&D service platform that are open to the public. Establish and improve a service system to support entrepreneurship and innovation in artificial intelligence.

(6) Perfect approaches to the management of the network economy.

Deepen telecommunication system reform. Comprehensively promote network convergence, further liberalize (放开) business competition in the basic telecommunications field, relax market access restrictions on converged products and services, and promote pilot projects in mixed ownership (混合所有制) of state-owned telecom enterprises. Break down industry barriers, promote the full interoperability (对接) of technology, standards, and

supervision in various industries and fields, and allow all types of entities to participate in market competition on an equal footing.

Strengthen the enactment of relevant legislation. In response to the new characteristics of the internet and the integration and development of various industries, adjust current regulations and policies that do not stack up to development requirements. Implement regulations on strengthening network information protection and information disclosure and accelerate the development of laws and regulations on network security and e-commerce.

3. Promote breakthrough developments in high-end equipment and new materials industries to lead to a new leap forward (新跨越) in Chinese manufacturing

In line with the development trends of the manufacturing industry towards intelligentization, environmental consciousness, a service mentality, and internationalization, accelerate breakthroughs in key technologies and core components around the implementation of the "Made in China 2025" strategy. Promote engineering applications and the industrialization of major equipment and systems and promote supply chain coordination. Develop and shape a new image for Chinese manufacturing and promote an overall improvement in the level of manufacturing. Strive to achieve a production value of more than 12 trillion yuan in the high-end equipment and new materials industries by 2020.

(1) Build a high-end smart manufacturing brand. Strive to improve the performance and quality of smart manufacturing core equipment and components, build an smart manufacturing system, strengthen basic support, actively carry out demonstration applications, form a number of internationally renowned brands, and promote a new level of smart manufacturing equipment.

Rigorously develop smart manufacturing systems. Accelerate the deep integration of new generation information technology and manufacturing technology, carry out a top-level design of cyber-physical systems (CPS) that integrates computing, communications, and control, explore and build the entire production process and lifecycle of products, establish smart manufacturing systems with deep learning awareness, intelligent optimized autonomous decision-making (智慧优化自决策), and precise and controlled execution. Promote robotic automated production lines, digital workshops, and smart factories with independent intellectual property rights. Provide overall solutions for key industries and promote the intelligent transformation of traditional manufacturing industries. Construct a test and verification platform and improve the system of smart manufacturing standards.

Promote a new level of smart manufacturing with key technologies and equipment. Build breakthrough technologies for industrial robot industry systems and core components, such as high-precision reducers, high-performance controllers, and precision measurement devices, with a focus on developing high-precision, high-reliability mid- to high-end industrial robots. Accelerate the research, development, and industrialization of high-end CNC lathes and computer-aided design and manufacturing centers and achieve breakthroughs in main functional components and key application software, such as multi-axis, multi-channel, high-precision high-end CNC systems and servo motors. Develop and promote applications with precision, high speeds, high efficiency, flexibility, and high-end CNC lathes, basic manufacturing equipment, and integrated manufacturing systems for functions such as network

communication. Achieve breakthroughs in smart sensing and control equipment, intelligent detection and assembly equipment, smart logistics and warehousing equipment, and intelligent agricultural machinery and equipment and improve quality and reliability by researching, developing, and promoting new equipment.

Create an additive manufacturing supply chain. Achieve breakthroughs in titanium alloy, high-strength alloy steel, high-temperature alloy, high temperature resistant high-strength engineering plastics, and other special materials for additive manufacturing. Build a technology research and development platform for additive manufacturing technology to elevate the level of technology. Develop and promote mainstream additive manufacturing process equipment driven by lasers, electron beams, ion beams, and other energy sources. Accelerate the development of high-power fiber lasers, scanning galvanometers, dynamic focusing mirrors, and high-performance electron guns and other supporting core components and embedded software systems, enhance the collaborative innovation of software and hardware, and establish additive manufacturing standards. In the fields of aerospace, medical equipment, transportation equipment, cultural creativity, and personalized manufacturing, rigorously promote the application of additive manufacturing technology and accelerate the development of additive manufacturing services.

Box 6: Smart Factory Application Demonstration Project for Key Areas
In the discrete manufacturing fields of machinery, aviation, aerospace, automotive, maritime, light industry, textiles, and electronic information, carry out integrated innovation and application demonstrations of intelligent workshops/factories and promote digital design, intelligent equipment upgrades, process optimization, and lean production with pilot applications in visual management, quality controls, traceability, and intelligent logistics to promote intelligentized integration of business processes. In petrochemical, steel, non-ferrous metals, building materials, textiles, food, medicine, and other process manufacturing fields, carry out integrated innovation and application demonstrations in smart factories. Improve the level of intelligence of enterprises in resource allocation, process optimization, process control, supply chain management, quality control and traceability, energy conservation and emission reduction, and safe production.

(2) Implement new breakthroughs in the aviation industry. Strengthen independent innovation, promote the industrialization and serialization of civil aviation products, strengthen the construction of industrial supporting facilities and safe operation support capabilities, improve product safety, environmental protection, economy and comfort, and comprehensively build aeroengines, complete aircraft, and an aviation industry system with industrial support and safe operation. Deliver civil large passenger aircraft and new regional aircraft by 2020. Make major breakthroughs in the development of aero-engines and basically establish systems for industrial support and demonstrations.

Accelerate the independent development of aero-engines. Rely on the major projects of aero-engines and gas turbines to achieve breakthroughs in key technologies of large-ducted turbofan engines and support the development of domestic regional aircraft. Develop a 1000-kilowatt turboshaft engine and a 5000-kilowatt turboprop engine to meet the power requirements of domestic serialized helicopters and medium-sized transport aircraft. Develop

piston engines that use fuel oils and turbine engines that use aviation biofuels to promote the market application of small engines.

Promote the industrialization of civil aircraft. Accelerate the implementation of major projects for large aircraft, complete the development of large passenger aircraft, launch the development of wide-body passenger aircraft, and achieve breakthroughs in core technology. Accelerate the development and serialized retrofitting of new regional aircraft, carry out demonstrations and design optimization of new aircraft models at home and abroad, and improve the adaptability and competitiveness of aircraft routes. Rigorously develop high-demand civilian helicopters, multi-purpose aircraft, special aircraft, and industrial-grade drones.

Improve the construction of industrial supporting systems. Improve the independent manufacturing level of aviation materials and basic components and master the core technologies of processing and manufacturing of aluminum-lithium alloys and composite materials. Rigorously develop aviation equipment and systems with high reliability, long service lives, strong environmental adaptability, standardization, and low costs to achieve airworthy deliveries. Accelerate the construction of major infrastructure for aviation scientific research and testing, increase the input of measurement and verification conditions such as structural strength, flight control, electromagnetic compatibility, and environmental testing, and strengthen the construction of test flight conditions. Achieve breakthroughs in a number of key airworthiness technologies, strengthen airworthiness certification conditions and capacity building, accelerate the improvement of airworthiness certification policies for various aviation products, such as transport aircraft, and build a sound organization, sufficient human resources, sound regulatory systems, advanced hardware facilities, and an airworthiness certification system with strong international cooperation capabilities. Accelerate the construction of a number of specialized digital demonstration factories to significantly improve the quality stability and production efficiency of aviation products. Actively promote the establishment of an international risk sharing partnership and build a fully functional aviation industry support system.

Develop new services for aviation operations. Implement various policies and measures to promote the development of the general aviation industry, rigorously cultivate the general aviation market, and promote the coordinated development of general aviation manufacturing and operation services. Rigorously develop aviation leasing. Use internet technology to establish an advanced system for aviation operations and promote service model innovations. Strengthen flight training and foster aviation culture. Develop integrated, universal, and intelligent communication, navigation, and control systems and develop technical systems and equipment for comprehensive risk management and multi-class airspace integration to form a support system for safe operations.

Box 7: Next-Generation Civil Aircraft Innovation Project
Provide support to major key projects and scientific research on civil aircraft. Achieve breakthroughs in a core set of technologies, systems, components, and materials and improve system integration capabilities. Emphasize the development of a series of large single-channel narrow-body, dual-channel wide-body aircraft and serialize new turboprop/turbofan regional aircraft and advanced general aviation aircraft. Emphasize demonstrations and marketing for new civil aircraft and establish market-competitive product support and

customer service systems. Complete C919 and MA700 airworthy deliveries to clients and achieve ARJ21 mass production and deliveries. Complete development and reach market applications for a group of key general-purpose aircraft.

(3) Make the satellites and applications industry bigger and stronger. Build a national civilian space infrastructure that is open, safe, reliable, and has long-term stability. Accelerate the integration of satellite applications and infrastructure. By 2020, fundamentally establish the national civilian space infrastructure. Meet the main business needs of various domestic fields and basically achieve independent safeguards of spatial information applications and form a relatively complete satellite and applications supply chain.

Accelerate the construction of satellite and applications infrastructure. Construct a remote sensing satellite system consisting of constellations and thematic satellites to form global data acquisition capabilities with high-medium-low resolution and reasonable multi-layer observations of air and space. Strengthen ground system construction and integrate high-precision, all-element, systematic Earth observation information to build Big Earth Data. Create a domestic platform for high-resolution commercial remote sensing satellite operation services. Develop three satellite systems for fixed communication broadcasting, mobile communication broadcasting, and data relay to form a satellite communication broadcasting system covering major regions of the world. Implement the Second-generation Satellite Navigation System National Science and Technology Major Project, accelerate the construction of satellite navigation space and ground systems, build the Beidou global satellite navigation system, and form high-precision global service capabilities. Promote the construction of remote sensing satellites with the public-private partnership (PPP) model.

Improve satellite performance and technology. Master satellite application platform technology with long service lives, high stability, high positioning accuracy, large load capacity and strong agility, and make breakthroughs in payload technologies such as high resolution, high precision, high reliability, and comprehensive detection. Give priority to the development of remote sensing satellite data processing technology and business application technology. Improve the technical performance of broadband communication satellites and mobile multimedia broadcast satellites. Strengthen satellite platform-type spectrum construction and promote the development of small and medium-sized microsatellites in an orderly manner.

Advance comprehensive satellite applications. Coordinate military and civilian space infrastructure, improve satellite data sharing mechanisms, strengthen satellite popularization, regionalization, and international applications, accelerate the application of satellite remote sensing, communications, and navigation integration, and utilize new technologies, such as the Internet of Things and the mobile internet to achieve Satellite Plus innovations. For disaster prevention and mitigation, emergency response, maritime operations, and other fields, carry out demonstrations of common comprehensive satellite applications. For governance administrative and social service needs, carry out demonstrations of integrated satellite applications in modern agriculture, new urbanization, smart cities, smart oceans, and remote areas. Focusing on the overall strategy of national and regional development, promote the in-depth development of Internet Plus Spatial Information Applications and create a new supply chain and business model for spatial information consumption. Promote commercial satellite

development and satellite commercialization. Actively deploy in overseas markets and establish a Belt and Road spatial information corridor.

Box 8: Spatial Information Intelligent Sensing Project
Accelerate the construction of national space infrastructure with remote sensing, communication, and navigation satellites at its core, strengthen interdisciplinary resource sharing and comprehensive information service capacity building. Actively promote the comprehensive application of spatial information and dynamically monitor and predict applications for resources, environmental protection, early warning, disaster prevention and mitigation, and emergency command. Provide timely and accurate spatial information services, strengthen the ability to provide comprehensive information services to the world, and rigorously expand the international market.

(4) Strengthen the leading position of rail transit equipment. Promote the intelligent, green, streamlined, serialized, standardized, and platformized (平台化) development of the rail transit equipment industry. Accelerate the application of new technologies, processes, and materials and develop advanced and reliable product series. Improve associated technical standards and construct a modern and innovative system for the rail transit equipment industry. Create a full supply chain layout covering regional railways, intercity railways, suburban railways, and urban rail transit.

Create an internationally competitive rail transit equipment supply chain. It will form a series of new high-speed electric multiple units (EMUs), energy-saving permanent magnet motor-driven high-speed trains, 30-ton axle heavy-duty electric locomotives and vehicles, and large-scale route maintenance machinery. Promote the research, development, and industrialization of new trains such as the 500 kph wheel-rail test train and the 600 kph mag-lev system and build a complete supply chain. Strengthen the comprehensive capacity building of product quality inspections, testing, and certification. Accelerate the pace of “going global” (“走出去”) and enhance international competitiveness.

Promote the research, development, and industrialization of new urban rail transit equipment. For the complex urban traffic needs of large cities, promote 120-160 kph urban (suburban) railway equipment that seamlessly connects to urban rail transit and a straddle monorail that adapts to different technical routes. Research, develop, and apply an automatic rail rapid transit system, construct a technology platform for the design, manufacture, verification, and testing of medium and low-speed 200 kph mag-lev systems. Establish and improve the product certification system, enact new technical standards and specifications for urban rail transit vehicles, and take the lead in international technical standards.

Achieve breakthroughs in key industrial components and green intelligent integration technologies. Further research and develop key systems and components, including train traction brake systems, train network control systems, communication signaling systems, electric drive systems, intelligent systems, coupler buffer systems, energy storage and conservation systems, high-speed wheelsets, high-performance railroad trucks (转向架), gearboxes, bearings, and lightweight car bodies. Strengthen the research, development, and industrialization of permanent magnet motor drives, fully automatic operations, and wireless integrated bearers based on fourth-generation mobile communications. Optimize and improve

high-speed railway train control systems and intercity railway train control technology standards.

(5) Enhance the international competitiveness of marine engineering equipment. Promote the development and diversification of offshore engineering equipment to deep sea and polar sea areas, upgrade main equipment structures, achieve breakthroughs in new key equipment, upgrade design capabilities and supporting systems, and form a complete industrial system covering scientific research and development, final assembly construction, equipment supply, and technical services.

Focus on the development of main marine engineering equipment. Accelerate the research and development of main offshore engineering equipment such as geophysical exploration vessels, deep-water semi-submersible platforms, drilling vessels, floating production storage and unloading devices, marine survey vessels, semi-submersible transport vessels, lifting and laying vessels, and multi-purpose marine engineering vessels. Build a service system and achieve world-leading design and construction capabilities.

Accelerate the development of new marine engineering equipment. Achieve breakthroughs in the research and development of design and construction technology for floating drilling production storage and unloading devices, floating LNG storage and regasification equipment, deep draft column platforms, tension leg platforms, polar drilling platforms, and offshore test sites. Establish large-scale production and manufacturing systems and achieve product performance and reliability that meets advanced international standards.

Strengthen the research, development, and industrialization of key supporting systems and equipment. Improve the design and manufacturing of key supporting equipment, such as lifting and locking systems, deep-water mooring systems, dynamic positioning systems, automatic control systems, underwater drilling systems, and flexible riser deep sea observation systems by combining production with study and research. Rigorously develop high-performance engines for marine engineering and enhance professional support capabilities.

Box 9: Marine Engineering Equipment Innovative Development Project
Promote the research and development of new equipment, such as large floating structures, deep-sea equipment, such as ultra-deep-water drilling platforms for depths of over 3,600 meters, and marine polar survey and observation equipment. Realize the engineering and industrialization of scientific research results and promote the coordinated development of final assembly and supporting industries. Improve marine engineering equipment standards.

(6) Improve the basic support capacity of new materials. Comply with the trend towards high performance, multi-functionality, and green development for new materials and promote the sustainable development of new special resources. Strengthen the distribution of cutting-edge materials based on strategic emerging industries and major engineering construction needs and optimize the atmosphere for the industrialization and application of new materials. Strengthen the establishment of new material standards and improve new materials applications to advance the integration of new materials into the high-end manufacturing supply chain. By 2020, strive to make certain that new material varieties enter

the global supply chain and that the self-sufficiency rate for major key materials reaches over 70% to initially realize the strategic transformation of China from a materials power (材料大国) to a materials superpower (材料强国).

Improve quality and efficiency to promote the new materials industry. For the development needs of aerospace, rail transit, electricity and electronics, and new energy vehicles, expand the scale of application of high-strength light alloys, high-performance fibers, special alloys, advanced inorganic non-metallic materials, high-quality special steels, new display materials, automotive battery (电力电池) materials, and green printing materials to gradually enter the global high-end manufacturing procurement system. Promote the advantages of new materials enterprises to "go global." Strengthen supply chain cooperation with well-known high-end manufacturing enterprises at home and abroad and carry out all-round cooperation in research and development design, production trade, and standard setting. Raise the added value of new materials, create new material brands, and enhance international competitiveness. Establish an evaluation system for new material technology maturity and study the establishment of the first batch of new materials application insurance compensation mechanism. Establish a new material performance test evaluation center. Refine and improve the statistical classification of new material products.

Construct new material standards based on applications. Focusing on the needs of next-generation information technology, high-end equipment manufacturing, energy conservation and environmental protection, strengthen the convergence of new materials product standards and downstream industry design specifications, accelerate the formulation of key new material standards, promote the revision of old standards, and strengthen the promotion and application of existing standards. Strengthen advanced research into new material standards and lay out a number of core standards in advance. Accelerate the internationalization of the new materials standards system and promote the internationalization of domestic standards.

Promote the sustainable development of new special resources. Promote the high-quality utilization of rare earth, tungsten-molybdenum, vanadium-titanium, lithium, graphite, and other special resources and strengthen the development of special processes and technologies. Promote the balanced use of the associated mineral resources and support the establishment of specialized resources, new materials recycling bases, and mineral functional material manufacturing bases. In new resources mining, smelting and separation, and in deep processing of special resources, promote the application of intelligent and green production equipment and processes. Develop new materials such as medical tissue engineering materials and biological environmental materials from marine sources.

Lay a prospective layout for the development of new cutting-edge materials. Achieve breakthroughs in application technology for graphene industrialization and expand the application range of nanomaterials in optoelectronics, new energy, and biomedicine. Develop smart materials, biomimetic materials, metamaterials, low-cost additive manufacturing materials, and new superconducting materials. Expand the research and development of materials needed for extreme environments such as air and sea, deep sea and deep underground, and form a series of highly influential innovations.

Box 10: New Materials Upgrade and Synergistic Applications Project
Strengthen the connection between new green building materials standards and public energy-efficiency building standards. Accelerate the development of standards for gear steel for rail transportation equipment, carbon/carbon-composite structural materials, high-temperature alloys, special glass, wide-bandgap semiconductors, electronic information chemicals, optical functional films, and artificial crystal materials for the aerospace industry. Improve the functional standards of functional membrane materials and marine anti-corrosion materials for energy conservation and environmental protection. Provide a standard layout for additive manufacturing materials, rare earth functional materials, and graphene materials and enhance the quality of new materials products. Strengthen the upstream and downstream cooperation in the new materials industry and carry out pilot demonstrations of synergistic applications in the fields of aviation aluminum, carbon fiber composite materials and nuclear power steel to build a synergistic applications platform.

4. Accelerate the pace of innovation and development of the biotech industry and foster new biotech economic drivers

Seize the deep development of the life sciences, the new application of new biotechnology and the new trends of integration and innovation, taking the rapid development of genetic technology as an opportunity. Promote the development of medical care with precision medicine and personalized medicine and accelerate the upgrading of agricultural breeding for efficient and precise breeding. Expand into new areas of marine life resources and promote biotechnology and products that can replace a broad range of applications. Promote the large-scale application of bioenergy with new development models and cultivate new formats of high-quality specialized biological services. Accelerate the development of the biotech economy into an important new post-information economy. Provide new support for the construction of a healthy and beautiful China. By 2020, bring the scale of the biotech industry up to 8-10 trillion yuan and form a group of new internationally competitive biotechnology enterprises and biotech economy clusters.

(1) Build a new biopharmaceutical system. Accelerate the development of innovative drugs and biological products that are in major clinical demand. Accelerate the promotion of green and intelligent pharmaceutical production technologies, strengthen scientific and efficient supervision, provide policy support, promote the international development of the industry, and accelerate the establishment of China as a biopharmaceutical power.

Promote leapfrog development in the biopharmaceutical industry. Accelerate the research and development of technologies such as gene sequencing, cell-scale culture, targeted and long-acting drug release, and green intelligent production to support the high-end development of the industry. Develop new antibodies and vaccines, gene therapy, cell therapy, and other biological products and preparations, promote the development of chemical drugs and the development of high-end preparations, and accelerate the development of distinctive innovative Chinese medicines. Achieve original innovations in major disease prevention and treatment drugs. Support the large-scale development of biosimilar drugs and carry out research, development, and production for large-scale patent-expired drugs. Accelerate the upgrading of pharmaceutical equipment, improve the level of pharmaceutical automation, digitization, and intelligence, and further promote the standardization of Chinese medicine products. Promote the integration of industry standards with the international standards. Accelerate the pace of internationalization. Develop innovative marine-sourced drugs, develop

modern marine-sourced Chinese medicine products catered towards minority ethnic groups, promote the industrialization of reagent raw materials and intermediates, and form a group of marine biopharmaceutical industry clusters.

Box 11: New Drug Creation and Industrialization Project
Focus on the establishment of a sustainable biopharmaceutical industry for emerging drugs such as antibody drugs, recombinant protein drugs, and new vaccines in particular and promote the development, industrialization, and quality upgrade of new drugs that are clinically scarce such as those for major diseases, multiple diseases, rare diseases, and childhood diseases. Integrate various elements to form a group of advanced product standards and internationally advanced industrial technology systems. Enhance the supporting capabilities of key raw materials and equipment to support the continuous innovation and development of biotechnology drugs.

Create new approaches to the regulation of biopharmaceuticals. Establish a more scientific and efficient method for drug review and approval, accelerate the pilot of the drug listing permit holder system, accelerate consistency evaluations for the quality and efficacy of generic drugs, and explore the pilot of the clinical laboratory research and approval system for new medical technologies. Improve drug procurement mechanisms and comprehensively promote the reform of institutional mechanisms in the fields of pharmaceutical prices and industry regulation.

(2) Enhance the development level of biomedical engineering. Deepen the integration of biomedical engineering technology with information technology and accelerate industry regulation reform. Actively develop new medical devices, build new models of medical treatment, such as mobile medicine and telemedicine, and promote the development of the intelligent medical industry. Promote the application of high-performance medical devices, advance the development of new instruments and reagents adapted to the development of new technologies in life sciences, and improve the overall competitiveness of China's biomedical engineering industry.

Develop new intelligentized mobile medical equipment. Develop intelligent medical equipment and its software and supporting reagents and a comprehensive telemedicine service platform and terminal equipment. Develop mobile medical services and formulate relevant data standards. Promote interconnection and initially establish a modern intelligent medical service system that deeply integrates information technology and biotechnology.

Develop high-performance medical equipment and core components. Develop high-quality medical imaging equipment, advanced radiotherapy equipment, high-throughput low-cost genetic sequencers, genetic editing equipment, rehabilitation medical equipment, and other medical equipment and significantly improve the stability and reliability of medical equipment. Use new technologies such as additive manufacturing to accelerate the innovation and industrialization of tissue and organ repair and replacement materials and medical device implants. Accelerate the development of new products such as in-vitro diagnostic equipment, devices, and reagents. Promote the development of new technologies such as high-specificity molecular diagnostics and biochips and support rapid and accurate diagnostic in-vitro screening for such ailments as tumors, genetic diseases, and rare diseases.

Box 12: Beneficial Biotechnology Project
Promote the construction of a network of genetic technology application demonstration centers and carry out application demonstrations such as birth defect genetic screening, early tumor screening, and medication guidance. Develop and apply new biotherapeutic technologies to promote the standardization and regulation of new individualized biotherapeutics. Develop intelligent and high-performance medical equipment, support enterprises, medical institutions, research institutions, and other jointly built third-party imaging centers and conduct collaborative diagnosis and treatment with pilot the establishment of resident health imaging files. Carry out regional and comprehensive application demonstrations to achieve regional biologically based plastic products and packaging materials that can replace more than 50% of traditional petrochemical plastic products. Construct a demonstration project for a biomass-based gas supply and heat supply around towns or enterprises and explore market-oriented development models that can deliver synergistic success.

(3) Accelerate the industrialization of biotech agriculture. With the goals of high efficiency, product safety, resource conservation, and environmental friendliness, create new varieties of biotech agriculture, develop new animal and plant nutrition and green plant protection products, build a new modern agricultural system, and form a group of internationally competitive biological breeding enterprises. Provide new ways and new support for accelerating the transformation of agricultural development.

Construct an atmosphere of independent innovation in the biological seed industry. Carry out key core technology innovations and breeding applications such as gene editing, molecular design, and cell mutagenesis and develop and promote a number of new varieties of agricultural animals and plants that are high-quality, high-yield, nutritious, safe, resource-efficient, and standardized for production. Actively promote biotechnology to cultivate new varieties of industrialization and form a batch of enterprise-based biological breeding innovation platforms to build modern biological species enterprises with core competitiveness and to promote integration. Accelerate the industrialization and marketization of new agricultural and plant varieties. Develop new technologies for animal and plant quarantine and strengthen the construction of quarantine platforms for the introduction of high-quality animal and plant resources from foreign countries.

Develop a number of new agricultural biological agents and major products. Rigorously develop new technologies and products for the prevention and control of animal and plant pests and diseases, establish a green pesticide and veterinary drug creation technology system based on pest and genomic information, and create a number of new animal vaccines, biological veterinary drugs, new plant pesticides, and other major products to achieve scaled production and applications and to promote the green transformation of agricultural production. Create new green biological feed and high-efficiency biofertilizers that replace antibiotics. Tap deeply into marine biological resources, develop green, safe, and efficient new marine biological functional products, and open up new means of comprehensive utilization. Promote key technological innovations and precision nutrition foods such as food synthesis biotechnology, food biotech efficient transformation technology, and intestinal microbial metagenomics.

(4) Promote the scaled application of biotech manufacturing. Accelerate the development of new technologies such as microbial genome engineering, enzyme molecular machines, and cell factories to enhance the economics of industrial biotechnology products. Promote the

penetration of biotech manufacturing technologies into chemical, materials, and energy fields and promote the progressive replacement of traditional chemical processing with clean bioprocessing methods to gradually replace fossil resources with renewable resources.

Continuously improve the economics and scale of biotech manufacturing. Develop new biotech tool creation and application technology systems to realize the biological production and application of basic chemical products such as organic acids, chemical alcohols, olefins, alkanes, and organic amines. Promote the establishment of a supply chain and the concentration and scaled development of biologically based materials such as biologically based polyesters, biologically based polyurethanes, biological nylons, biological rubbers, and microbial polysaccharides. Enhance independent innovations and the development of bulk fermentation products such as amino acids and vitamins.

Establish an ecologically secure, green, low-carbon, and recycling system for biological processing. Develop high-efficiency industrial biocatalytic conversion technology systems to improve the application of green biotechnology. Establish biocatalytic synthesis routes such as steroidal drugs, chiral compounds, and rare sugar alcohols to achieve green and large-scale production of pharmaceutical and chemical intermediates. Promote green biotech processing to fully introduce and demonstrate applications in the agriculture, chemicals, food, medicine, textiles, metallurgy, and energy fields to significantly reduce energy consumption and pollutant emissions.

(5) Cultivate new forms of biological services. Promote the development of biotechnology service innovations for a specialized division of labor. Build a new technology specialization service model and continuously create new biotech economy growth points.

Enhance the professional service capabilities of biotechnology for consumers. Develop specialized medical institutions and cultivate new types of technical diagnosis and treatment services such as liquid biopsy and genetic diagnosis that meet regulatory requirements. Develop health management services such as health checkups and consultations and mobile healthcare. Promote the establishment of biotech big data, and medical and health big data sharing platforms. Pilot the establishment of resident health imaging files, encourage the construction of a smart diagnosis and treatment ecosystem that combines online and offline functionality, and promote the professional development of services such as medical inspection and imaging diagnosis.

Box 13: Biotech Industry Innovation Development Platform Building Project
Relying on and integrating with existing resources, build a number of innovative basic platforms to support the construction of gene banks, stem cell banks, Chinese medicine standards libraries, high-level biosafety laboratories, and protein component libraries. Accelerate the construction of a number of transformative applications platforms and promote the construction of carriers such as antibody screening platforms, medical imaging information libraries, and crop molecular breeding platforms. Actively develop a number of testing services platforms, promote the construction of generic drug consistency evaluation technology platforms, biopharmaceutical quality and safety testing technology innovation platforms, agricultural product safety and quality testing platforms, and biomass energy testing and monitoring and public service platforms, and improve relevant standards.

Improve the level of industry support for biotechnology services. Develop drug research, development, and production services in line with international standards and encourage pharmaceutical companies to strengthen cooperation with contracted research and development and entrusted manufacturing enterprises. Promote the transformation of emerging technologies such as genetic testing and diagnostics in various fields and support bioinformatics service agencies to improve their technology. Provide public services such as testing, evaluation, and certification for biological products such as pharmaceuticals, medical devices, the seed industry, and biotech energy products, accelerate the time-to-market, and improve product quality. Encourage biotechnology to expand with applications in areas such as water pollution control, air pollution control, toxic and hazardous substance degradation, and waste recycling and actively guide biotech environmental technology companies to cross-regional and cross-industry alliances or mergers to grow bigger and stronger. Construct a biotechnology specialization entrepreneurship and innovation platform, reduce the cost of innovation and entrepreneurship in biotech industry, and support all citizens who wish to set up virtual R&D enterprises to unleash the potential for innovation.

(6) Create models for the development of bioenergy. Focus on the development of a new generation of biomass liquids and gas fuels, develop high-performance biomass energy conversion system solutions, expand the market for biotech energy applications, and strive to achieve comprehensive scaled applications in the fields of power generation, gas supply, heat supply, and fuel oil to bring bioenergy utilization technology and core equipment technology to a globally advanced level and form a more mature commercial market.

Promote clean applications for biomass energy. Focus on promoting the development of key technologies and equipment for high-service-life, low-power biomass fuel molding equipment, biomass heating boilers, and distributed biomass cogeneration and promote biomass-forming fuels to replace coal-fired central heating and biomass heat and power production. In accordance with local conditions and the principles of production and consumption, demonstrate the construction of centralized large-scale biogas application projects and achieve breakthroughs in critical technical bottlenecks such as large-scale biomass centralized gas supply processing and high-efficiency biogas anaerobic fermentation. Explore the establishment of diverse, synergistic, and win-win market-oriented development models, encourage the comprehensive utilization of multiple products, and provide clean and high-quality energy for production and life.

Promote the industrialization of advanced biotech liquid fuels. Focus on breaking through the bottleneck of high-efficiency and low-cost biomass liquid fuel raw material processing and preparation technology and build a 10,000-ton biomass preparation liquid fuel and multi-product co-production comprehensive utilization demonstration project. Improve the raw material supply system and develop biodiesels in an orderly fashion. Promote the research, development, and industrialization of cutting-edge technologies such as algal biofuel and aviation biofuel.

5. Promote the rapid growth of new energy vehicles, new energies, energy conservation, and environmental protection industries and build a new model for sustainable development.

Seize the development trend of global energy reform and meet the demands of China's industrial green transformation and development. Focus on ecological progress and address climate change. Focus on green low-carbon technology innovations and applications to guide green consumption, promote green products, and significantly increase the proportion of new energy vehicles and new energy applications. Comprehensively promote the construction of an efficient, energy-saving, advanced environmental protection and resource recycling industrial system and promote green low-carbon industries such as new energy vehicles, new energy, energy conservation, and environmental protection so that they become pillar industries of the Chinese economy with an output of over 10 trillion yuan by 2020.

(1) Achieve the scaled application of new energy vehicles. Strengthen technological innovation, improve the supply chain, optimize the supporting environment, implement and improve supporting policies, improve the industrialization of pure electric vehicles and plug-in hybrid vehicles, and promote the industrialization of fuel cell vehicles. Achieve production and sales of over 2 million vehicles per year by 2020 with cumulative production and sales of over 5 million. Ensure that the overall level of technology keeps pace with the international market and form a group of internationally competitive new energy vehicle and key component enterprises.

Improve the overall quality and performance of electric vehicles. Accelerate innovations and applications in electric vehicle system integration technology, focusing on vehicle safety, reliability research, and streamlined design. Improve the technical level, supporting capacity, and vehicle performance of key components. Accelerate the formulation and application of safety standards for electric vehicles. Accelerate the application of electric vehicle intelligent technology innovations and develop intelligent autonomous vehicles. Carry out the research and development of energy storage application technology for electric vehicle power systems, implement joint applications for distributed new energy and electric vehicles, and promote the integration of electric vehicles and smart grids, new energy, energy storage, and intelligent driving. Establish a joint innovation platform for electric vehicles and strategic alliances for cross-industry and cross-domain technological innovation to promote collaborative innovation in key technologies for electric vehicles. Improve production approval policies for electric vehicles and study and implement the new energy vehicle credits management system. Strive to achieve market competitiveness in electric vehicle commercialization by 2020.

Build a globally competitive automotive battery supply chain. Rigorously promote the development of automotive battery technology, focus on achieving breakthroughs in battery grouping and system integration technology, and advance the development of next-generation automotive batteries and new system automotive batteries to achieve breakthrough development in battery material technology. Accelerate innovations in high-performance, high-reliability automotive battery production, control, and testing equipment and enhance automotive battery engineering and industrialization capabilities. Cultivate and develop a group of leading automotive battery companies and key materials enterprises with continuous innovation capabilities. Promote the use of automotive battery ladders and establish a automotive battery recycling system that connects upstream and downstream enterprises. Match international automotive battery technology by 2020 and reach a global production capacity.

Box 14: New Energy Vehicle Automotive Battery Upgrade Project
Improve automotive battery research and development, accelerate the construction of automotive battery innovation centers, and achieve breakthroughs in technical bottlenecks for lithium ion batteries such as guaranteeing high safety, long service lives, and high energy density. Build a number of technological innovation centers for key battery materials and key production equipment, achieve breakthroughs in high-capacity positive and negative materials, high-safety diaphragms, and functional electrolyte technologies. Increase production, control, and testing equipment innovation and promote greater engineering capabilities along the entire supply chain. Carry out research and development in new technologies for fuel cells, all-solid lithium-ion batteries, metal-air batteries, and lithium-sulfur batteries.

Systematically promote the development and industrialization of fuel cell vehicles. Strengthen research on fuel cell base materials and process mechanisms to promote the development of high-performance, low-cost fuel cell materials and key system components. Accelerate improvements in the reliability and engineering of fuel cell stack systems and improve relevant technical standards. Promote the development of on-board hydrogen storage systems and hydrogen preparation, storage, and transportation technologies and promote the construction of hydrogen refueling stations. Achieve the mass production and scaled demonstration of fuel cell vehicles by 2020.

Accelerate the construction of a standardized and convenient infrastructure system. In accordance with the principle of "taking actions to suit local conditions and modestly advancing development" ("因地适宜、适度超前"), prioritize the construction of a public service area charging infrastructure in urban development and actively promote the construction of charging stations in residential areas and company parking spaces. Improve charging facilities standards and promote the interconnection and intercommunication of charging infrastructure. Accelerate the development of new charging and replacement technologies and equipment for high power density, high conversion efficiency, high applicability, wireless charging, and mobile charging. Strengthen testing and certification, security protection, power grid two-way interaction, and other key technologies. Rigorously promote the Internet Plus Charging Infrastructure to improve the level of intelligent charging services. Encourage charging service companies to introduce innovative business models and enhance their ability to sustain development. Establish a charging infrastructure system to meet the needs of electric vehicles by 2020.

(2) Promote the development of new energy industries. Accelerate the development of advanced nuclear power, high-efficiency optoelectronic lighting and heating, large-scale wind power, high-efficiency energy storage, and distributed energy, accelerate improvement in the economics of new energy products, and accelerate the construction of electric power system mechanisms, new power grids, and innovation support systems that adapt to new energy high-proportional development. Promote multi-energy complementarity and collaborative optimization to lead the energy production and consumption revolution. Bring nuclear power, wind power, solar energy, and biomass energy up to over 8% of total energy consumption with an industrial output value of over 1.5 trillion yuan to build a world-leading new energy industry.

Promote the safe and efficient development of nuclear power. Adopt the highest international safety standards, adhere to cooperation and innovation, focus on the development of large-scale advanced pressurized water reactors, high-temperature gas-cooled

reactors, fast reactors, and post-processing technology and equipment, upgrade key components, and support the construction of demonstration projects. Improve nuclear waste recycling and safe disposal capabilities. Integrate industry resources, form system service capabilities, and promote nuclear power to accelerate the “going global” initiative. Achieve a nuclear power installed capacity of 58 million kilowatts and an under-construction scale of 30 million kilowatts by 2020 to form internationally advanced nuclear power industry chain development capabilities that integrate technology development, design, equipment manufacturing, and operation services.

Promote high quality and efficient development and utilization of wind power. Rigorously develop smart grid technology and develop and explore system peak regulation capabilities to greatly improve the capacity for wind power consumption. Accelerate the development of high-tower long blades, intelligent blades, and special technologies used in decentralized and offshore wind power. Focus on the development of wind turbines with a capacity of more than 5 MW, the intelligent development and operation of wind farms, offshore wind farm construction, wind and heat utilization, and other key technologies and equipment. Establish a public service platform for wind power technology testing and industrial monitoring. Achieve an installed capacity for wind power of over 210 million kilowatts and achieve a fundamental price parity between wind power and the coal-fired power grid by 2020 with technological innovation at an internationally advanced level for wind power equipment.

Promote the diversification and development of solar energy. Achieve breakthroughs in the bottlenecks of advanced crystalline silicon cells and key equipment technologies, improve the efficiency of thin-film solar cells, and strengthen the development of new high-efficiency and low-cost solar cell technologies such as perovskite, dye sensitization, and organics. Rigorously develop solar integrated application technology, promote efficient and low-cost solar energy utilization of new technologies and industrialization of new materials, and build a public service platform for solar photovoltaic thermal product testing and industrial monitoring to greatly improve the ability of innovation and development. Coordinate power markets and external transmission channels and promote the development of photovoltaic thermal power generation in western China in an orderly manner. Accelerate the development of distributed photovoltaics in central and eastern China and promote the comprehensive development and utilization of various forms of solar energy. Accelerate the implementation of the photovoltaic leader program, form the integration and supporting capacity for the system of solar thermal power stations, promote the application of advanced solar energy technology products and the rapid decline of power generation costs, and lead the development of the global solar energy industry. Achieve an installed capacity for solar power of over 110 million kilowatts and strive to achieve user-side power grid parity by 2020. Specifically, achieve an installed scale for distributed photovoltaic power generation, photovoltaic power plants, and solar thermal power generation of 60 million kilowatts, 45 million kilowatts, and 5 million kilowatts, respectively.

Actively promote the comprehensive utilization of various forms of new energy. Achieve breakthroughs in the bottlenecks of wind-power hybrid power, advanced fuel cells, high-efficiency energy storage, and ocean energy generation. Accelerate the development of biomass gas supply and heating, biomass and coal-fired coupled power generation, geothermal heating, air source heating, biotech liquid fuel, and ocean energy heating and cooling. Carry out multi-industry applications and regional demonstrations for biogas and promote the

industrialization of new energy multi-product, multi-generation, multi-supply technology. Accelerate the development of distributed energy integration for energy storage and microgrid applications and rigorously promote the construction of multi-energy complementary integration optimization demonstration projects. Establish a feasible system of technological innovation, infrastructure, operations, and policy support for the comprehensive development and utilization of new energy.

Rigorously develop "Internet Plus" smart energy. Accelerate the development of key technologies such as distributed energy, energy storage, and intelligent microgrids. Build an intelligent power operation monitoring and management technology platform to establish coordinated "source-grid-load-storage-use" (“源—网—荷—储—用”) system development around renewable energy into an integrated energy internet. Develop energy production big data forecasting, scheduling, operations, and maintenance technologies. Establish a public service network for monitoring, managing, and dispatching information on energy production operations and promote information docking and production and consumption intelligence in the upstream and downstream energy supply chain. Promote the development of green energy networks that integrate hardware such as energy storage facilities, the Internet of Things, smart power facilities, and derivative services such as carbon trading and Internet finance. Promote the development of intelligent energy use at the user end, the energy sharing economy, and free energy trading. Cultivate new businesses and new business models based on smart energy and build a new energy consumption ecology and industrial system.

Accelerate the formation of an institutional environment that adapts to new energy high-proportional development. Focusing on the goal of significantly increasing the proportion of renewable energy and abandoning wind and solar rejection rates, improve dispatching mechanisms and operation and management models to establish a grid operation management system that adapts to the large-scale development of new energy and power. Improve national standards and clean energy pricing mechanisms for new energy sources such as wind power, solar energy, and biomass energy and establish a new energy priority consumption mechanism. Establish a dynamic adjustment mechanism and supporting management system for renewable energy power generation subsidy policies. Incorporate distributed new energy into power and heating planning and the national new distribution network transformation plan. Promote the coordinated development of “source-grid-use” (“源—网—用”) and achieve distributed new energy direct supply and barrier-free access.

Box 15: New Energy High-Proportional Development Project

To achieve flexible and friendly integration of new energy sources and full energy consumption, accelerate safe and efficient transmission networks, reliable and flexible active distribution networks, and a variety of distributed power sources to provide access to interactive microgrid construction. Demonstrate the application of intelligent large-scale energy storage systems and flexible DC transmission projects and establish an intelligent interactive supply and demand power system that meets the demand for diversified load access, such as distributed power, electric vehicles, and energy storage. Build a new power grid system that is adapted to new energy high-proportional development.

Select suitable areas for the comprehensive development of new energy sources, such as distributed optoelectronics, decentralized wind power, biomass energy supply, geothermal energy, and ocean energy. Integrate large-capacity energy storage applications with micro-grid technology to build a comprehensive utilization system for distributed energy and lead the way for energy supply changes.

(3) Rigorously promote the development of high-efficiency and energy-saving industries. Adapt to the requirements of building a resource-saving and environment-friendly society, establish the concept of energy conservation, comprehensively promote energy conservation, improve energy-efficient equipment technology and product applications, promote energy-saving technology system integration and demonstrations, and support the energy conservation service industry so that it may grow bigger and stronger and promote the rapid development of high-efficiency and energy-saving industries. Strive to reach a scaled output value for high-efficiency and energy-saving industries of 3 trillion yuan by 2020.

Rigorously improve the level of technology and applications for high-efficiency and energy-saving equipment. Encourage the development of high-efficiency and energy-saving equipment (products) and key components, increase demonstration and promotion efforts, and accelerate the reduction of overall costs. Revise and enforce mandatory performance and energy consumption limit standards and accelerate the transformation and application of energy-saving scientific and technological achievements. Publish catalogs of energy-saving products and technologies, improve government procurement policies for energy-saving products, and promote a market share for energy-saving products. Improve energy efficiency labeling and the energy-saving product certification system, implement a system of energy-efficiency leaders in the industrial, construction, transportation, and consumer goods fields, and encourage energy-efficient enterprises and product manufacturers to improve energy efficiency by leaps and bounds.

Rigorously promote the integration and demonstration of energy-saving technology systems. Pilot energy-saving technology system integration in key areas such as demonstration parks and key industries and integrate residual heat, pressure, and gas resources for high energy-consuming enterprises. Encourage the use of residual heat for heating and generate electricity through the use of residual energy and low-temperature residual heat. Encourage the use of intelligent energy metering and remote diagnostic equipment in key energy-consuming companies and for energy-consuming equipment as well as the use of information network technology to enhance automatic system monitoring and intelligent analysis capabilities to promote comprehensive energy efficiency. Deeply advance process industry system optimization technology, promote the construction of energy management centers in industrial enterprises, encourage companies to use solar collectors in low-temperature heating stages, and achieve overall production process and energy supply optimization. Promote the industrialization of near-zero consumption of fossil energy building technology and rigorously popularize the application of energy-saving doors and windows, green energy-saving building materials, and other products. Encourage the integration of wind power, solar power, and enterprise energy supply systems to promote localized renewable energy consumption.

Expand and strengthen the energy-saving service industry. Support the rapid development of contract energy management, franchising, and other business models, promote energy-saving service business model innovation, and promote overall energy-saving service solutions. Support energy-saving service companies as they strive to achieve scaled operations, branding, and network operations through mergers, alliances, and restructuring. Set up a green

financing platform to promote the issuance of green bonds to support the financing of energy-saving service companies. Formulate relevant standards and improve the standardization of energy conservation services. Formulate management measures for energy conservation service organizations and establish and improve third-party evaluation mechanisms for energy conservation. Build a contract performance registration and services platform for energy-saving service providers, key energy-consuming companies, and third-party evaluation agencies to create an honest and trustworthy market environment.

Box 16: Energy-Saving Technology and Equipment Development Project
Organize the implementation of key, common energy-saving technology to improve engineering and energy-saving equipment manufacturing projects. Encourage the development of a batch of energy efficient equipment (products) and key components, such as high-performance building insulation materials, photovoltaic curtain walls for photovoltaic integrated construction, compact household air source heat pump devices, high-power semiconductor lighting chips and devices, advanced high-efficiency gas turbine power generation equipment, technology and equipment for the clean and efficient use of coal, shallow geothermal energy utilization devices, and regenerative high temperature air combustion devices. Implement comprehensive energy efficiency and environmental protection upgrades for coal-fired boilers and heating pipe networks with energy efficiency improvements for motor drive systems. Promote major key energy-saving technologies and product scale application demonstrations, such as energy-saving and ultra-low emission conversions for coal-fired power plants, motor system energy savings, energy system optimization, and residual heat and residual pressure utilization. Organize the implementation of urban, business park, and enterprise-level energy-saving demonstration projects and promote the demonstration and application of high-efficiency and energy-saving technologies.

(4) Accelerate the development of advanced environmental protection industries. Rigorously promote the implementation of action plans for water, air, and soil pollution prevention and control and publicize the overall linkage between regional and watershed pollution prevention and control. Deeply promote the reduction of major pollutants in land and sea planning, advance the development of the environmental protection equipment industry, and press for improvements in major pollutant monitoring and control technology and equipment. Strengthen the promotion and application of advanced and applicable environmental protection technology equipment and integration innovations. Actively promote the application of advanced environmentally friendly products and promote the development of the environmental services industry to comprehensively improve the development level of the environmental protection industry. Strive to achieve a scaled output value for the advanced environmental protection industry of over 2 trillion yuan.

Improve pollution prevention technology and equipment capabilities. Emphasizing the prevention and control of water, air, and soil pollution, focus on a number of key treatment technologies for pollution such as industrial wastewater, smog, soil pesticide residues, and water and soil heavy metal pollution and accelerate the formation of production capabilities for complete equipment sets, core components, and supporting materials. Construct a number of major environmental protection technology and equipment industrialization demonstration bases with advanced technology, complete facilities, and standardized development. Form a sound industry development pattern with backbone enterprises at its core and with small and medium-sized enterprises specializing to achieve rapid growth. Support the research and development of hazardous waste prevention technologies and improve the level of treatment

and disposal of hazardous waste. Support the optimization and integration of environmental industry resources and actively expand the international market.

Strengthen the promotion and application of advanced and applicable environmental protection technology equipment and integration innovations. Routinely update the *Catalog of Major Environmental Protection Technology and Equipment Promoted by the State* (《国家鼓励发展的大环保技术装备目录》), strengthen the connection between supply and demand, and strengthen the application of advanced and applicable environmental protection equipment in key fields such as metallurgy, chemicals, building materials, and food. Accelerate the deep integration of the environmental protection industry with next-generation information technology and advanced manufacturing technology. Strengthen advanced environmental protection equipment manufacturing capabilities and improve the level of comprehensive integration. Support the establishment of an environmental technology innovation alliance combining production, scholarship, and research and accelerate the research and application of technology integration innovations.

Actively promote the application of advanced environmentally friendly products. Rigorously promote the use of ion exchange resins, biological filter materials and fillers, high-efficiency activated carbon, recirculating cooling water treatment chemicals, bactericides and algaecides, water treatment disinfectants, solid waste treatment curing agents and stabilizers, and other environmentally friendly materials and chemicals. Expand the scope of government environmentally friendly product procurement and continuously increase the proportion of products procured. Implement an environmentally friendly product leader system, improve environmentally friendly product standards, actively promote the application of advanced environmentally friendly products, and organize the implementation of advanced environmentally friendly equipment technology advancement and model innovation demonstration projects.

Enhance comprehensive environmental service capabilities. Based on big data on pollutants in various industries, promote the establishment of an environmental equipment and service demand information platform, a technology innovation transformation trading platform, and an environmental protection equipment bidding information platform to improve the level of informatization of environmental protection services. Promote the application of satellite and Internet of Things technologies in environmental monitoring, construct a basic data and monitoring and disposal information platform for pollution discharge and environmental quality, and improve the level of environmental supervision and intelligence to deeply promote pilot work in the environmental service industry. Develop environmental restoration services, promote contracted environmental services, and advance the promotion and application of overall environmental protection solutions. Carry out third-party environmental pollution control and entrusted comprehensive environmental management services pilot projects and deeply explore third-party environmental control models in key areas such as the treatment of urban sewage waste and the centralized treatment of pollution in industrial parks. Promote the creation of green product demonstration enterprises and support enterprises that implement green design.

Box 17: Green Low-Carbon Technology Comprehensive Innovation Demonstration Project

Connect green low-carbon pilot demonstration projects, and where conditions allow, build new energy, new energy vehicles, and smart transportation systems, low-carbon communities, carbon-capture and carbon-rich agriculture, green smart factors, and other integrated applications and facilities around the comprehensive application of green low-carbon technology and brought together through the internet. Be the first to implement relevant reform measures to promote green low-carbon technologies, next-generation information technology and urbanization, integration and innovation in production and life, and extensive international cooperation to create comprehensive application demonstration areas for related technologies.

(5) Deeply promote the recycling of resources. Establish the concepts of saving, intensively using, and recycling resources, rigorously promote the comprehensive utilization of co-contained ore and tailings, the development of "urban mining," the recycling of agricultural and forestry waste, and the recycling of new varieties of waste. Develop the remanufacturing industry, improve resource recycling infrastructure, enhance the level of policy support, and promote the development of the resource recycling industry. Strive to replace 1.3 billion tons of primary resources and reach an output value for the resource recycling industry of 3 trillion yuan by 2020.

Rigorously promote the comprehensive utilization of bulk solid waste and tailings. Promote the comprehensive utilization of industrial waste such as metallurgical slag, chemical slag, red mud, and phosphogypsum, support a batch of advanced applicable technologies and equipment, and strengthen the recycling of strategic rare metals in industrial solid waste. Research and develop deep processing and comprehensive utilization technology for tailings to promote the recovery of associated valuable tailings elements and the development of high-tech tailings products and improve the comprehensive and economic utilization of tailings. Research and develop key technologies and equipment for complex polymetallic tailings dressing and smelting and the clean and harmless comprehensive utilization of key technologies. Research and develop single-equipment processing capabilities of up to one to five million tons per year for high-efficiency and concentrated tailings filling, preparation, transportation, and loading technology. Develop low-grade titanium slag optimization and upgrading technology to improve comprehensive utilization for vanadium-titanium magnetite resources.

Promote the development of "urban mining" and the use of low-value waste. Improve the level of technology and equipment for dismantling and utilization of waste electrical and electronic products and scrapped vehicles to promote the large-scale development of agglomeration of waste non-ferrous metals and waste plastics. Accelerate the construction of resource-based and harmless treatment systems for urban kitchen waste, construction waste, and waste textiles and synergistically play the role of various solid waste treatment facilities to create urban low-value waste cooperative treatment bases. Implement relevant preferential policies for land, financing, and taxation. Improve the recycling and utilization infrastructure for renewable resources and support existing renewable resource recycling and distribution center upgrades.

Strengthen the recycling of agricultural and forestry waste. Basically realize the utilization of agricultural and forestry waste such as livestock and poultry manure, residual film, crop residue, and forestry harvesting residues, materials residues and processing residues. Promote

straw decomposition and field return technology and support the industrialization of new technologies such as straw substitute wood, fiber raw materials, clean pulping, biomass energy, and commercial organic fertilizer. Encourage the use of livestock and poultry manure, straw and other agricultural and forestry wastes, and implement rural household biogas and centralized biogas projects in accordance with local conditions. Promote the application of standard mulch and provide guidance of the recycling of used mulch and the use of degradable mulch. Encourage the use of forestry waste in the establishment of biomass cogeneration projects for heating, electricity, oil, and medicine. Actively develop ultra-low emission incineration technology for agricultural and forestry waste.

Actively carry out the recycling of new varieties of waste. Carry out demonstrations of new varieties of waste recycling systems and promote the recycling of waste materials such as waste solar cells, waste power storage batteries, waste carbon fiber materials, and waste energy-saving lamps. Promote the efficient enrichment and clean recycling of rare metals and the utilization of electric vehicle automotive battery cascades. Support the development and application of carbon capture, utilization, and storage technologies and develop the carbon cycle industry.

Rigorously promote the comprehensive utilization of seawater resources. Accelerate the research, development, and industrialization of seawater desalination and usage technology to improve the reliability, advancement, and supporting capabilities of core materials and key equipment. Promote the construction of seawater desalination equipment manufacturing bases for concentrated development. Carry out demonstration projects for the utilization of seawater resources and promote the general contracting and services of large-scale desalination projects. Carry out pilot demonstrations of seawater desalination, encourage the production of seawater desalinated bottled water, and promote the desalination of seawater into the municipal water supply pipelines according to law. Promote the large-scale application of seawater cooling technology in coastal water-intensive industries. Accelerate the extraction of potassium, bromine, magnesium, and other products from seawater to achieve high-value utilization.

Develop a remanufacturing industry. Strengthen technical research and equipment research and development for non-destructive testing of mechanical products, green and efficient cleaning, and automated surface and volume repair to accelerate industrial applications. Organize the implementation of remanufacturing technology process application demonstrations and promote the remanufacturing of nano-brush plating technology equipment, arc spraying, and other mature surface engineering equipment demonstration applications. Carry out remanufacturing of high-value parts such as engines and shield machines. Establish remanufacturing traceability for old parts and product tracking information systems to promote the development of remanufacturing industry standards.

Improve the resource recycling industry system. Promote the application of Internet of Things electronic supervision technology in the fields of hazardous waste and electronic waste utilization and disposal and support renewable resources enterprises to establish a recycling network for online and offline integration. Coordinate the domestic and international use of renewable resources and strengthen the connection between domestic waste separation and recycling and reuse of renewable resources. Establish resources to recycle third-party service

systems, encourage the adoption of contract management methods, and provide total solutions for waste management, recycling, reprocessing, and reuse. Fully implement the producer accountability extension system to encourage the use of recycled products and raw materials. Establish and improve standards for solid waste, hazardous waste, recycled products, and pollutant control.

Box 18: Resource Recycling Alternative System Demonstration Project
Implement circular development to promote the recycling and utilization of new types of waste materials such as solar photovoltaic cells, waste electronic products, multi-component separation and extraction, and electric vehicle power storage batteries and waste liquid crystals to demonstrate an "Internet Plus" based waste recycling system. Advance the coordinated disposal of low-value waste in cities and the comprehensive utilization of bulk solid waste to accelerate development. Establish an old parts recycling system with a system for after-sales maintenance at its core and promote the application of remanufactured products in trade logistics, financial insurance, maintenance, and sales as well as in coal, petroleum, and mining companies. Encourage specialized remanufacturing service companies to provide total solutions and special services.

6. Promote the vigorous development of the digital creative industry and drive new consumption.

Promote the development of industries such as culture, creative, and innovative design with digital technology and advanced concepts and promote the deep integration of culture with science and technology as well as mutual interaction with other related industries. Form a development pattern for the digital creative industry with leading culture, advanced technology, and a complete supply chain with an output value for related industries of up to 8 trillion yuan by 2020.

(1) Create innovative digital culture and creative technology and equipment. Adapt to immersive experiences, intelligent interaction, and other trends, strengthen collaborative innovation of content and technology equipment, keep up with global trends in the field of content production technology, establish international leading advantages in the field of consumer service equipment, and encourage the in-depth application of the latest innovations in related fields.

Improve the level of creative production technology and equipment. Increase the research and development of basic technologies such as space and emotional perception and accelerate the innovation and development of core technologies such as virtual reality, augmented reality, holographic imaging, naked-eye 3D graphics displays (naked eye 3D), interactive entertainment engine development, digital processing of cultural resources, and interactive film and television. Strengthen the application of big data, Internet of Things, artificial intelligence, and other technologies in the field of digital cultural creative creation and production, and promote the close connection between the innovation chain and the supply chain. Encourage enterprises to use digital creation, network collaboration, and other means to improve production efficiency.

Enhance the level of technology and equipment for communication services. Research and develop supporting equipment and platforms such as Super Sensitive Movie Theaters (超感影院), Mixed Reality Entertainment (混合现实娱乐), and Radio, Film, and Television Fusion Media Broadcasting with independent intellectual property rights and explore new areas of

consumption. Rigorously develop digital art presentation technology, enhance the digitalization, intelligentization, and networkization applications of art exhibitions and support the industrialization and application of cultural relic protection equipment. Study and formulate key standards for digital cultural and creative technology and equipment, promote the internationalization of independent standards, and improve the quality management system for digital cultural and creative technology, equipment, and related services.

Box 19: Digital Culture and Creative Technology and Equipment Innovation Enhancement Project
Integrate production, scholarship, and research around enterprises and build a digital cultural and creative industry innovation platform. Strengthen basic technology research and development, rigorously develop new software and hardware products such as virtual reality, augmented reality, and interactive film and television, and promote related content development. Improve the digital cultural and creative industry technology and service standards system, promote the widespread application of standards for mobile phones (mobile terminals), animation, film, and television, and establish standards for digital protection and inheritance of cultural relics, smart museums, and ultra-high-definition content production and transmission. Improve services for digital creative entrepreneurship and innovation.

(2) Enrich the content and forms of digital culture and creativity. Excavate outstanding cultural resources, inspire cultural creativity, adapt to the characteristics of internet communication, and create high-quality, diverse, and personalized digital creative content products through new methods such as grassroots creativity and creative collaborations.

Promote the creative transformation of outstanding cultural resources. Encourage the digital transformation and development of cultural resources such as artwork, cultural relics, and intangible cultural heritage. Relying on distinctive local cultures, create digital creative content products with distinctive regional characteristics and national characteristics. Strengthen the connection between modern design and traditional craftsmanship and promote integration and innovation. Improve the level of digitization and intelligentization of libraries, art galleries, cultural centers, and experience halls, strengthen the construction of smart museums and smart cultural heritage sites and create new interactive experience applications.

Encourage the creation of contemporary digital creative content. Strengthen the development of high-tech support for cultural product creation, improve the level of originality in digital creative content products, accelerate the digitalization of publishing, film and television production, performing arts and entertainment, art, cultural exhibitions, and improve cultural taste and market value of animation games, digital music, online literature, online video, and online performances. Encourage creative development models that link multiple industries, improve the degree of integration and conversion efficiency between different forms of content, and strive to form digital creative brands with global influence to support Chinese culture as it "goes global."

Box 20: Digital Content Innovation Development Project
Relying on advanced digital technology, promote the implementation of culture and creative product support programs and the "Internet Plus" Chinese Civilization Action Plan, support the promotion of a number of digital cultural heritage products, create a number of outstanding digital culture and creative products, build a digital culture resource platform, and realize the intelligent retrieval, development,

utilization and popularization of cultural and creative resources, expand communication channels, and guide the formation of the supply chain.

(3) Enhance the level of innovative design. Explore endogenous forces driving the development of the innovative design industry and promote design innovation as core competence in the fields of manufacturing, service industry, and urban and rural construction.

Strengthen the leading role of industrial design. Actively develop third-party design services to support the transformation of design results. Encourage enterprises to increase industrial design investment, promote industrial design and corporate strategy, and brand deep integration, and promote the application of innovative design in product design, system design, process design, business modeling, and service design. Support enterprises in upgrading traditional process equipment through innovative design and promote the continuous upgrading of process equipment from single machines to interconnection and mechanization to automation. Lead innovation in the commerce and trade circulation industry with creativity and design, strengthen advertising services and improve the brand value system. Formulate and promote industry standards to promote industrial transformation and upgrading. Support the construction of a public service platform for industrial design. Use industrial design to shift Made in China to Created in China and from Chinese Speed to Chinese Quality.

Enhance the level of living environment design. Innovate in urban planning and design, promote the integration of surveying and mapping geographic information technology and urban planning, and use big data, virtual reality, and other technologies to establish a planning information platform covering regions, urban and rural areas, and above-ground and underground areas and guide innovative urban planning. Strengthen urban design from a multi-faceted perspective such as at the macro-, meso- and micro-level, and create a distinctive landscape. Encourage architectural design creation, improve the bidding system and expert evaluation system, expand the scope of architects' practice services, guide architects to participate in project planning, architectural design, and project management, and form a policy environment that encourages architects to create. Increase the training of architects and cultivate a team of architects with both international vision and cultural confidence. Advocate for new landscape design and improve the living environment. Further improve the level of decorative design.

Box 21: Innovative Design Development Project

Formulate and implement an outline of action for manufacturing innovation design, build a number of state-level industrial design centers, and build a number of industrial design clusters with international influence. Design big data platforms and knowledge bases in areas such as additive manufacturing to promote data sharing and supply and demand linkage. Promote the transformation of innovative design results through the development of venture capital, government procurement services, and crowdfunding pilots.

(4) Promote the integration and development of related industries. Promote the application of digital culture and creativity and innovative design in various fields, foster more new products, new services, and new forms of multi-directional interaction, and form a borderless penetration pattern for the creative economy.

Accelerate the integration and development of key areas. Promote the application of digital creativity in e-commerce and social networks and develop new marketing models such as virtual reality shopping, social e-commerce, and the “fan economy” (“粉丝经济”). Promote the application of digital creativity in the field of education, enhance the creative level of learning content, strengthen the development of digital cultural education products and the in-depth use of public information resources, and promote the creativization (创意化) of educational services. Enhance the cultural connotation and digital level of tourism product development and tourism service design and promote the innovation and development of new modes such as virtual tourism displays. Explore the development potential of creative “agriculture, farmers, and rural areas” (“三农”), improve the creativity level of leisure agriculture, promote the development of geotagged agricultural products and rural culture, and promote rural tourism development and new rural construction with creative homestays. Promote digital creativity in the medical, exhibition, geographic information, public management, and other fields. Build a digital creative related project resource pool and linkage service platform and use various forms of online and offline promotion methods to conduct extensive exhibition activities and encourage industry associations and research institutions to actively carry out cross-domain exchanges and cooperation.

Promote the construction of a digital creative ecosystem. Establish a digital creative intellectual property protection system that covers laws, regulations, administrative means, and technical standards, increase efforts to crack down on piracy and infringement in the digital creative field, and protect the legitimate rights and interests of right holders. Actively research and solve the risk problems in the promotion and application of virtual reality and online gaming and effectively protect the physiological and mental health of users. Improve the management of digital creative industry-related regulations, further relax access conditions, simplify the approval process, strengthen post-incident supervision, and promote integrated development.

7. Prepare the groundwork for strategic industries and cultivate new advantages for future development.

With a global vision and forward-looking frontier technology research and development, continue to promote new industries, focus on breakthroughs in core areas such as aerospace, information networks, life sciences, and nuclear technology, with a high degree of focus on disruptive technologies and business model innovation, in a number of strategic areas of competition. Form unique advantages, grasp the initiative of future industrial development, provide strategic reserves, and expand strategic space for sustainable economic and social development.

(1) Air and sea field:

Significantly enhance space entry capabilities. Achieve breakthroughs in key technologies, such as large thrust engines, large-diameter rocket body designs, and manufacturing and advanced controls and exhibit heavy-duty launch vehicles to ensure the implementation of major space missions in the future. Develop fast, inexpensive, reusable, small-load, and space-to-earth transportation systems. Advance deployment of spacecraft autonomous navigation and flight technology with high spatial positioning accuracy.

Accelerate the development of new spacecraft. Strengthen the research and development of key technologies such as ultra-high resolution, ultra-high-precision space-time reference, ultra-high-speed safety communication, high-performance on-board processing, high-power power supply, and new materials and develop new application satellites. Establish an advanced manned space science experiment platform and life support system. Develop spacecraft lightweight and miniaturization technology to promote the orderly development of applied micro-, nano-, and picosatellite specifications. Deploy and launch new test satellites. Accelerate the development of new spacecraft for future missions such as near-earth spacecraft and reusable spacecraft.

Accelerate key technological breakthroughs and major product developments in the aviation industry. Carry out advanced research into key technologies for new engines such as hydrogen fuel, all-electric, and combined power to enhance the future development capability of the aviation industry. Accelerate the development of strategic aviation equipment such as multi-purpose drones and new aircraft types. Formulate a forward-looking layout for supersonic business machines, new concepts, and new configurations for overall pneumatic technology, advanced high-reliability electromechanical technology, new generation avionics systems, new aviation materials, and new composite processing technologies.

Develop a new generation of deep sea and offshore polar technical equipment and systems. Establish deep sea area research bases, develop marine remote sensing and navigation, underwater acoustic detection, deep sea sensors, unmanned and manned deep dives, deep sea space stations, deep sea observation systems, “air-sea-seabed” (“空—海—底”) integrated communication positioning, new ocean observation satellites, and other key technologies and equipment. Rigorously develop resources and equipment for the development and utilization of deep-sea oil and gas mineral resources, renewable energy, and biological resources, research and develop large-scale floating structures at sea, support the research and development and industrial application of key technologies for the utilization of marine resources, and foster new growth points in the marine economy. Rigorously develop polar resources development and utilization equipment and systems and develop polar robots, nuclear-powered icebreakers, and other equipment.

(2) Information network field:

Build a new system for future networks. Focus on improving the scalability, security, manageability, mobility, and content distribution capabilities of the current network architecture, systematically research new network architectures, technical systems, and security assurance systems, conduct experimental network construction, and research and build a new network of ubiquitous convergence, green bandwidths, and intelligent security.

Strengthen key technologies and product development. For the needs of the Internet of Everything, develop an Internet of Things search engine, e-class high-performance computing, edge-oriented computing, and other technologies and products. Carry out the research and development of cutting-edge technologies in the fields of deep learning, cognitive computing, virtual reality, and natural human-computer interaction to enhance the intelligence and personalization of information services. Prepare for the development of technologies such as

terahertz communication and visible light communication to continue to promote the application of key quantum technology.

Promote the revolutionary upgrading of electronic devices. Strengthen research and development on cutting-edge technologies and devices in the field of low-power, high-performance new silicon-based devices, silicon-based optoelectronics, hybrid optoelectronics, and microwave optoelectronics to form a number of special key manufacturing devices and improve the support capabilities of optical network communication components. Coordinate the development of key technologies for quantum chips, quantum programming, quantum software, and related materials and device preparation and promote the physical realization of quantum computers and the application of quantum simulations. Strengthen the research and development of new-theory (新原理) components such as neuromorphic chips, superconducting chips, graphene storage, non-volatile storage, and memristors and promote the development and application of microelectronics technology in the late Moore's Law era to realize a leap forward in industry development.

(3) Biotechnology field:

Construct a new medical model based on stem cell and regeneration technology. Accelerate the development of somatic cell reprogramming science and technology and develop functional cells to acquire new technologies. Improve technology platforms and bases for in vitro and in vivo production of cells, tissues, and organs. Standardize the system of laws, regulations, and standards for stem cell and regeneration, improve the evaluation and transformation mechanisms for intellectual property, and continue to deepen the clinical application of stem cell and regeneration technology. Develop tumor immunotherapy technology.

Promote the development and application of gene editing technology. Establish a gene editing technology system with independent intellectual property rights and develop new gene therapy technologies for major genetic diseases, infectious diseases, and malignant tumors. Establish relevant animal resource platforms and clinical research and transformation application bases to promote clinical transformation and industrialization development based on genetic editing research.

Strengthen the development and application of synthetic biotechnology. Achieve breakthroughs in the key technologies of genomic chemical synthesis, biological system design and reconstruction, and artificial biological regulation and promote the clinical application and industrialization of artificial biology and artificial biological devices. Promote disruptive technological innovation in the fields of biological breeding, ecological protection, and energy production and build a new model of basic raw material supply, material conversion synthesis, and people's livelihood services to foster a synthetic biotech industry supply chain.

(4) Nuclear technology field:

Accelerate the development of a new generation of nuclear energy equipment systems. Accelerate the development of new nuclear energy system testing and verification and experimental reactor construction such as lead-cooled fast reactors and bismuth-based molten salt reactors. Support the research and development of small and micro-nuclear power reactors and key equipment development and carry out experimental reactor construction and

demonstration applications in key areas. Actively participate in the International Thermonuclear Experimental Reactor megaproject, continuously improve the national major scientific and technological infrastructure such as the full superconducting tokamak nuclear fusion experimental device, and carry out experimental reactor conceptual design and research and development into key technologies and important components.

Develop non-power nuclear technology. Support the development of new ion sources such as ions and neutrons, research and develop high-resolution radiation detectors and multi-dimensional dynamic imaging devices, develop precision treatment equipment, medical radioisotopes, neutron detection, radiation modification, and other new technologies and products, and continue to promote the application of nuclear technology in the fields of industry, agriculture, medical health, environmental protection, resource exploration, and public safety.

8. Promote the cluster development of strategic emerging industries and build a new pattern of coordinated development

Based on the overall strategies of regional development, focus on promoting the construction of the Belt and Road, the coordinated development of the Beijing-Tianjin-Hebei metropolitan region, and the development of the Yangtze River Economic Belt. According to the industrial bases and characteristic advantages of each area, adhere to local conditions, industry layouts, and timeliness in policy implementation to accelerate the formation of strategic emerging industries with the part and whole integration, complementary advantages, differential development, and coordinated sharing.

(1) Create strategic emerging industry sources. Support innovative resource-rich central cities in forming strategic emerging industry sources that diffuse knowledge and technology. Give full play to the advantages of intensive scientific research talent, complete disciplines, and frequent international exchanges in source cities, support the construction of a number of world-class universities and research institutions, strengthen basic research in key areas, rigorously promote the development of emerging disciplines and interdisciplinary fields, and support the construction of new interdisciplinary research centers. Promote the development of original, subversive, and supportive technologies in the fields of information, life sciences, medical care, and energy, promote the integration of production, education, and research, and form "sources of radiation" (“辐射源”) that lead the development of strategic emerging industries. Take the opportunity of promoting comprehensive innovation and reform experiments to accelerate reform and address problems. Improve research project fund management to transform scientific and technological achievements, minimize institutional barriers that are not conducive to the development of innovative talent, and explore the establishment of institutional mechanisms to adapt to the cross-border movement of innovative elements. Give play to the role of cities in reform and innovation demonstrations and promote a number of major reforms with strength, distinction, and influence throughout the country. Rigorously promote the development of new formats for science and technology intermediaries, support overseas talent, scientific research personnel, university teachers, and students to innovate in policy source cities, support overseas famous universities, scientific research institutions, and enterprises to build industrial innovation platforms and incubators in source cities, and create strategic emerging industry entrepreneurship and innovation bases.

Encourage source cities to carry out the construction of “strong intellectual property cities” (“知识产权强市”), strengthen the protection of intellectual property rights, strengthen the use and management of intellectual property rights, accelerate the development of intellectual property services, make better use of global innovations, and accelerate the spread of scientific and technological achievements across the country.

(2) Strengthen a number of world-class development clusters for strategic emerging industries. Relying on the construction of urban agglomerations and focusing on the comprehensive innovation reform pilot zones, develop knowledge-intensive strategic emerging industry clusters, create roughly ten landmark industrial clusters with global influence, and lead the development of strategic emerging industries in China. Promote the formation of strategic emerging industries, systematic and institutional innovation zones, supply chain and innovation chain integration zones, and international cooperation zones. Build a world-class strategic emerging industrial city cluster in the eastern region, focus on the coordinated development of the Beijing-Tianjin-Hebei metropolitan region, strengthen connections between economic and scientific talent in Beijing, Tianjin, and Hebei, and form a development community for strategic emerging industries that will lead the development of the Bohai Sea region and the hinterland of North China. Give play to the leading role of the Yangtze River Delta urban agglomeration in the Yangtze River Economic Belt and use the metropolitan areas of Shanghai, Nanjing, Hangzhou, Hefei, Suzhou, and Wuxi as hubs to construct an industrial development pattern of part and whole integration and chain group integration. Focusing on Guangzhou and Shenzhen, comprehensively enhance the international competitiveness of the strategic emerging industries of the Pearl River Delta urban agglomeration, extend the layout of the supply chain and service chain, and promote the transformation and development of the regional economy. Promote the development of biomedicine, high-end equipment manufacturing, next-generation information technology, new materials and other industries and the marine economy in the Shandong Peninsula urban agglomeration. Focus on key cities such as Fuzhou and Xiamen to promote the development of industries such as biology, oceans, and integrated circuits on the West Side of the Taiwan Strait. Relying on the industrial bases of the central and western regions, vigorously promote the development of strategic emerging industries in key areas such as the Chengdu-Chongqing area, Wuhan metropolitan area, Changsha-Zhuzhou-Xiangtan urban agglomeration, Zhongyuan urban agglomeration, and Guanzhong Plain urban agglomeration. Actively create conditions to undertake industrial transfer in the eastern region. Support cities such as Kunming and Guiyang in developing industries with comparative advantage and promote the coordinated development of industries in the middle and lower reaches of the Yangtze River Economic Belt. Link to the construction of the Silk Road Economic Built and promote the development of distinctive industries in the northwest, such as the North Slope of the Tianshan Mountains and the Lanzhou-Xining urban agglomerations. Promote the development of robotics and intelligent equipment, optoelectronics, biomedicine, medical equipment, information services, and other industries in Northeast China, with Shenyang, Dalian, Harbin, and Changchun as hubs to support the urban agglomerations of Northeast China in building a leading domestic strategic industrial cluster and driving regional economic transformation and upgrading.

(3) Cultivate clusters of strategic emerging industries. Give full play to the role of existing industrial clusters, inspire market vitality through systematic and institutional innovations,

promote industrial agglomeration by means of marketization, improve support policies and increase support, and cultivate over a hundred advantageous industrial clusters and distinctive supply chains and small, medium, and large-sized enterprises. Improve the government's approaches to guiding industrial agglomeration, attract investment, and introduce intelligence and technology to create a new economy based on talent and technology investment. Fully integrate and utilize global innovation resources and market resources from "welcoming in" (“引进来”) to "welcoming in" and "going out." Dynamically shift from industrial chain development to industrial chain and innovation chain development. Focus on key industry sectors, rely on scientific research institutions and enterprise research and development foundations, and enhance industrial innovation capabilities. Shift away from the separation of industry and city to city and industry integration. Promote the relative concentration of research institutions, innovative talents, and enterprises and advance positive interaction between different innovators. Avoid excessive intervention in market behavior and prevent redundant office park construction. Encourage strategic emerging industries to gather around key functional platforms such as national new districts.

9. Promote the open development of strategic emerging industries and expand new pathways to collaboration

Implement the national open development strategy, build a new mechanism for international cooperation in strategic emerging industries, build a global innovation and development network, promote the global layout of the supply chain, and expand new paths of development.

(1) Actively introduce global resources. Seize Belt and Road construction opportunities, advance international capacity collaborations, build an open innovation system, encourage technology introduction and collaborative research and development, and promote technology introduction, absorption, and re-innovation (再创新). Actively guide the direction of foreign investment, encourage foreign investors to invest in strategic emerging industries, and promote the establishment of research and development centers in China by multinational corporations and internationally renowned research institutions. Enhance the introduction of high-end overseas talent and smoothly absorb healthy channels for attracting overseas high-end talent, and make it more convenient for overseas talent to work and start businesses in China.

(2) Create a new platform for international cooperation. Actively establish international collaboration mechanisms and promote the signing and implementation of intergovernmental cooperation agreements on emerging industries and innovation. Promote bilateral mutual recognition personnel qualifications and product standards, certification, and accreditation results and participate in international multilateral cooperation and mutual recognition mechanisms. Establish bilateral international cooperation parks for distinctive industries and guide leading enterprises to build offshore cooperation parks overseas, focusing on developed countries and countries along the Belt and Road. Create new cooperation methods and enhance the level of open cooperation in key areas. Strengthen the construction of public service systems for the transformation and incubation of international scientific and technological achievements and personnel training.

(3) Build a global innovation and development network. Establish and improve coordinated promotion and service mechanisms for international innovation and development, strengthen

the service capabilities of foreign institutions, and use the G20 and Summer Davos platforms to carry out new economic exchanges, give full play to the role of relevant industry associations and chambers of commerce, and build a platform for international economic and technological exchanges and cooperation. Guide social capital to set up a number of cross-border mergers and acquisitions and investment funds in strategic emerging industries, support a number of cities that link international cooperation to strategic emerging industries, build a number of international cooperation innovation centers, develop a number of high-level international intermediary service organizations, establish a number of overseas research and development centers, build a global research and development system, and form an efficient and collaborative international cooperation network between governments, enterprises, investment institutions, scientific research institutions, legal institutions, and intermediaries. Support enterprises and scientific research institutions in participating in international science and technology collaboration projects, international science programs, and big science projects and undertake and organize major international scientific and technological cooperation projects. Encourage enterprises to actively participate in the development of international technical standards.

(4) Deeply integrate into the global supply chain. Promote the global supply chain layouts and identify different promotion methods and implementation paths for key countries and regions in key areas such as high-end equipment, next-generation information technology, and new energy and advance the optimization and integration of supply chain resources. Support enterprises, industry associations, chambers of commerce, and local governments and departments in carrying out out innovative international capacity collaborations in strategic emerging industries and promote domestic enterprises and Chinese-foreign enterprises in jointly developing international markets, support the “going global” of the supply chain to feed high-quality assets, technology, and management experience from "going global" back to China and form comprehensive competitive advantages. Promote the overseas expansion of leading enterprises in high-end equipment and next-generation information technology and carry out higher-level cooperation with multinational enterprises to achieve complementary advantages and win-win development.

10. Improve mechanisms, policies, and systems to create a new development ecosystem

Accelerate the implementation of the innovation-driven development strategy, deepen the transformation of government functions, continue to deepen reforms in key areas and key links, and strengthen institutional development, and pool innovative elements such as knowledge, technology, capital, and talents to comprehensively create an ecosystem conducive to the development of strategic emerging industries.

(1) Improve management approaches.

Streamline administration, delegate power, strengthen regulation, and improve service reform. In the fields of telecommunications, new drugs and medical equipment, and new energy vehicle production access, further improve review and approval methods, minimize restrictions on prior access, modify and abolish administrative regulations and regulatory documents that hinder development, and stimulate the vitality of market players. Adhere to the delegation of power, differentiate between different regions, actively explore and innovate regulatory methods to suit the development of new technologies, new products, new formats,

and new models, and inspire innovation and creative vitality and yet guard against possible risks. Formulate custom regulatory models for new formats such as "Internet Plus" and the sharing economy that are well-defined for development prospects and potential risks, strengthen monitoring and analysis in areas that are not visible, and encourage inclusive development, and avoid excessive strictness. Strengthen supervision over people with high potential risk that may cause serious adverse social consequences and resolutely ban those who illegally operate in the name of innovation. Strictly implement various policies and measures to reduce the cost of enterprises in the real economy, implement relevant policies and measures for the management of funds for central financial research projects, and advance the reform of the property rights system for scientific and technological achievements. Fully implement and deepen the various arrangements for the reform of state-owned enterprises, lead pilot demonstrations of mixed-ownership reform in state-owned enterprises in strategic emerging industries, and experiment with employee shareholding in mixed-ownership enterprises. Promulgate a catalog of key products and services for strategic emerging industries.

Create a fair competitive market environment. Improve supporting legislation under the anti-monopoly law, further increase anti-monopoly and anti-unfair competition law enforcement, and seriously investigate and deal with corporate violations in the fields of information services and medical services. Establish sound working mechanisms, ensure the orderly implementation of a fair competition review system, break past bottlenecks and industry monopolies in areas such as renewable energy power generation, medical equipment, and drug bidding, and strengthen the investigation and punishment of local protectionism and monopolistic industry behavior. Improve the credit system, give full play to the role of the national credit information sharing platform and the national enterprise credit information publicity system, and promote the establishment and linkage of, and service innovation for, various credit information platforms. Strengthen online disclosure and the sharing of credit records and provide operators with services such as credit information inquiry and corporate identity online certification.

Strengthen policy coordination. Give full play to the role of the inter-ministerial joint conference system for strategic emerging industries, promote the implementation of reform measures, strengthen work communication, and avoid fragmentation of relevant policies. Continue to carry out industrial development status assessment and forward-looking research and accurately position the direction of reform and development. Establish high-level government-enterprise dialog and consultation mechanisms and actively listen to corporate opinions when researching and formulating relevant policy measures. Regularly release key developments for the development of the new economy, foster new kinetic energy, strengthen strategic emerging industries, and coordinate and promote relevant reform and development work.

(2) Construct a system for industrial innovation.

Deeply carry out widespread entrepreneurship and innovation. Create crowd-creation, crowdsourcing, crowd support, and crowdfunding platforms. Relying on regions, research institutes and innovation enterprises, and other carriers of entrepreneurship and innovation resources, support the construction of "entrepreneurship and innovation" (“双创”)

demonstration bases, and develop professional spaces for innovation. Relying on the internet to create open and shared innovation mechanisms and innovation platforms, promote synergistic innovation among enterprises, scientific research institutions, universities, creators, and other innovators. Strive to improve and promote the system of "entrepreneurship and innovation" laws and policies. Continue to strengthen propaganda on "entrepreneurship and innovation," hold the annual "entrepreneurship and innovation" activity week, create a good atmosphere in which the whole of society pays attention to "entrepreneurship and innovation," and understand and support "entrepreneurship and innovation."

Strengthen the construction of a public innovation system. Implement a number of major scientific and technological projects and major works to strengthen the research, development, and industrialization of disruptive technologies. Create new major project organization and implementation methods and explore the implementation of relatively separate organizational management mechanisms for project management, decision-making, implementation, evaluation, and supervision. Build an industrial technology innovation alliance that is enterprise-led and combines governance with production, scholarship, and research. Support the construction of key technology research and development platforms and adopt a new mechanism in key industries to establish a number of industrial innovation centers. Focusing on innovation needs in key areas, coordinate the deployment of innovative platforms such as major national science and technology infrastructures and strengthen the open sharing of facilities and platforms. In accordance with the optimal layout of scientific research bases, build a number of national technology innovation centers to support the development of strategic emerging industries. Strengthen the construction of public service platforms for measurement and testing, inspection and testing, certification and accreditation, and knowledge and data centers. Establish a strategic emerging industry measurement technology innovation alliance to strengthen the certification and recognition of innovation. Implement and improve standardized development planning for strategic emerging industries, improve the system of standards, and support the application of new technology standards in key areas.

Support the establishment of enterprise innovation capabilities. Implement national technological innovation projects, strengthen the capacity building of enterprise technology centers, promote the top 100 projects of innovative enterprises, foster a group of innovative leading enterprises with international influence, and lead the drive to improve the innovation capabilities of upstream and downstream industries. Increase innovation support for small and medium-sized enterprises in science and technology, implement tax incentives such as deductions for research and development expenses, and guide enterprises to increase investment in research and development.

Improve upon the transfer and transformation system for scientific and technological achievements. Implement relevant laws, regulations, and policies and organize the implementation of the scientific and technological achievements transfer and optimization initiative. Implement reform measures related to the transformation of scientific and technological achievements into commercial products, increase the proportion of revenue from the transformation of achievements into commercial products that goes to scientific research personnel, and accelerate the establishment of performance evaluations and annual reporting systems for the transfer of scientific and technological achievements into commercial products. Guide qualified universities and research institutes to establish specialized and market-oriented

technology transfer institutions, strengthen the release of scientific and technological achievements in strategic emerging industries, and explore the preliminary transformation of scientific and technological achievements formed by the use of fiscal funds in strategic emerging industries.

(3) Strengthen the protection and application of intellectual property rights.

Strengthen intellectual property rights protections and safeguards. Actively advance the revision of the Patent Law and the Copyright Law. Track the development and innovation of new technologies, new formats, and new models, strengthen research on intellectual property protection rules in the fields of the internet, e-commerce, and big data, and improve relevant legislation on business model intellectual property protections, trade secret protections, and practical art design patent protections. Improve intellectual property rights rapid rights protection mechanisms and build a number of rapid rights protection centers. Incorporate international intellectual property rights infringement on social credit records, improve mechanisms for investigating and dealing with intellectual property rights and administrative infringement, strictly crack down on intellectual property rights in accordance with the law, increase customs enforcement on intellectual property rights, and promote higher limits for statutory compensation for intellectual property infringement for intellectual property rights infringement.

Strengthen the use of intellectual property rights. Rigorously promote the standardized management of intellectual property rights and enhance the intellectual property management capabilities of innovators. Implement the intellectual property industry layout and regional layout projects and guide the establishment of intellectual property layout design centers in strategic emerging industry clusters and leading enterprises. Build a system of intellectual property rights operation services, promote the construction of a national public service platform for intellectual property rights operations, and cultivate a group of specialized and branded intellectual property service agencies. Encourage development applications such as high-end search and analysis tools and guide the construction of intellectual property alliances. Focus on strategic emerging industries, encourage innovative intellectual property financial products, develop new products such as intellectual property investment, insurance, and funding linkages, and explore intellectual property rights equitization and securitization. Encourage enterprises to comprehensively use patents, copyrights, trademarks, and other intellectual property rights to create their own brands.

Improve development mechanisms for intellectual property rights. Implement strategic advancement plans for the intellectual property rights industry for strategic emerging industries, deploy the intellectual property rights service chain around strategic emerging industry clusters, and establish intellectual property rights cluster management systems. Strengthen patent analysis and trend monitoring for strategic emerging industries. Establish an evaluation system for intellectual property rights analysis of major economic and technological activities and encourage enterprises to establish evaluation mechanisms for intellectual property rights analysis. Improve the overseas system of intellectual property rights services and establish an early warning mechanism for overseas intellectual property rights risks. Study and publish information on the overseas intellectual property environment, track and study international intellectual property trends in key industries, guide the establishment of

information submission mechanisms for overseas intellectual property cases, and strengthen research on major intellectual property cases. Provide intellectual property rights support for enterprises that carry out overseas mergers, acquisitions, and rights protection activities.

(4) Further promote military-civil fusion.

Construct a strategic emerging industry system for military-civil fusion. Promote mutual compatibility and coordinated development of military and civilian science and technology innovation systems and promote the development of the military-civil fusion industry. Relying on the national military-civil fusion innovation demonstration zones, promote the industrialization of military-civilian dual-use technology. Construct a number of military-civil fusion and innovation platforms. In areas where military units are concentrated and industries have good industrial bases, promote the two-way transfer of military and civilian technologies and their transformation and application. Support military enterprises in giving full play to their advantages in new fields such as new energy, civil aerospace, and the Internet of Things, guide private enterprises to enter the field of national defense scientific research, production, and maintenance, and build a policy environment for fair competition among enterprises.

Strengthen the construction of major projects for military-civil fusion. In transforming the country into a space superpower (航空强国), coordinate the planning and development of military and civilian satellites, strengthen the integration and information sharing of ground station networks, and actively develop power systems, key components, and basic materials with a high degree of generalization. Adapt to the airspace reform process, strengthen airspace control system technology and equipment research and development, and promote the in-depth integration and development of the aviation industry. In transforming the country into a networking power, strengthen the sharing of next-generation information infrastructure and systems for military and civilian construction and organize the implementation of demonstration projects related to safe and reliable information network products and services. In transforming the country into a maritime power, adapt to military marine resources surveys, sea use, ocean observation and forecasting, marine environmental protection and island reef construction needs and develop military and civilian high-performance equipment and materials technology. Carry out general standardization projects for the military and civilians and promote the two-way transfer of military and civilian technologies.

(5) Increase financial and taxation support.

Increase the proportion of direct financing for enterprises. Actively support the listing or public financing of qualified enterprises in strategic emerging industries, research and launch the national share transfer system for the listing of companies on the growth enterprises market board, and establish a joint docking mechanism between the national share transfer system and the regional equity market. Explore and advance the OTC securities trading market and the construction of inter-agency private equity product quotation and service systems to support the development of strategic emerging industry ventures. Rigorously develop venture capital investment and angel investment, improve tax support policies for encouraging venture capital enterprises and angel investors to invest in seed-based and start-up technology-based enterprises, and enrich merger and acquisition financing and venture capital investment methods. Actively support the issuance of bond financing by qualified enterprises in strategic emerging industries, expand the scale of credit enhancement bonds for small and micro-sized

enterprises and collective bills for small and medium-sized enterprises, encourage the exploration and development of financial products such as high-yield bonds and convertible bonds, and steadily promote the development of debt financing instruments for non-financial enterprises. Encourage insurance companies, social insurance funds and other institutional investors to participate in strategic emerging industry venture capital and equity investment funds in a legal and compliant manner. Promote pilot work on investment and loan linkage.

Strengthen financial product and service innovation. Guide financial institutions to actively improve credit management and loan review systems that are adapted to the characteristics of strategic emerging industries. Explore the establishment of an investment and financing information service platform for strategic emerging industries to connect banks to enterprises. Encourage the establishment of a system for determining, assessing, pledging, and transferring intangible assets in digital creative, software, and other areas and advance financial product innovation, such as intellectual property rights pledge financing, equity pledge financing, supply chain financing, and technology insurance. Guide policy and development financial institutions towards increasing support for strategic emerging industries. Promote the development of a number of financial leasing and lending companies that cater to such industries as the aircraft, marine engineering equipment, and robotics industries. Accelerate the establishment of a national financing guarantee fund to support the financing of strategic emerging industry projects.

Create new fiscal and taxation policy support methods. Give play to the guiding role of fiscal funds, create new ways to attract social investment, and rigorously support the development of strategic emerging industries. Give full play to the role of the National Emerging Industry Venture Capital Guidance Fund (国家新兴产业创业投资引导基金) in serving entrepreneurship and innovation. Improve management rules and properly prevent and control risk. Efficiently carry out investment operations, introduce social capital to set up a group of venture capital funds and increase investment in strategic emerging industries. Encourage regions with the right conditions to set up strategic emerging industry development funds and guide community investment to set up a number of strategic emerging industry investment funds and international investment funds. Actively use models such as public-private partnership (PPP) to guide social capital to participate in the establishment of major projects. Improve government procurement policies, increase support for "entrepreneurship and innovation" and cloud computing, big data, and the recycling economy (循环经济), and advance demonstration applications, such as smart cities, information-for-citizens, "urban mines" (“城市矿山”) and smart equipment. Further improve subsidies for renewable energy power generation such as photovoltaics, wind power, and biomass. Adjust and improve subsidy policies for new energy vehicles. Improve the individual income tax policy for equity incentives for strategic emerging industries.

(6) Strengthen personnel training and incentives.

Cultivate talent for industry shortages. Implement the leading innovative talent initiative, focus on key areas for strategic emerging industries, build a group of innovative talent training demonstration bases based on major projects and major works, and support a group of science and technology innovators and entrepreneurs. Formulate a catalog of talented professionals in demand by industry for strategic emerging industries and focus on supporting relevant national

talent programs. According to the needs of industrial development, dynamically adjust the teaching content and curriculum of colleges and universities and reasonably expand the proportion of enrollment associated with strategic emerging industries. Strengthen the training of technical and skilled talent in strategic emerging industries, promote the new system of enterprise apprenticeships, establish a national basic vocational training package, and encourage related enterprises to provide jobs for students in vocational schools in strategic emerging industries. Relying on the knowledge and expertise of professional and technical personnel to update projects, train a large number of high-level, urgently-needed talented people and key professional and technical personnel to build a number of national-level continuing education bases. Promote the development of online training.

Encourage the flow of scientific and technological talent to enterprises. Explore policies related to scientific research personnel in the public sector who wish to start their own businesses and leave their jobs. Guide and support scientific research personnel in the public sector to carry out innovative work or start businesses in accordance with relevant state regulations. Set up a group of post-doctoral research workstations in enterprises in strategic emerging industries to encourage the development of key core technologies in those industries. Implement state incentives for scientific research personnel and encourage enterprises to mobilize the enthusiasm of researchers for innovation through incentives such as equity and dividends. Establish and improve talent utilization, flow, evaluation, and incentive systems in line with industry characteristics.

Make the most of global talent. Introduce and train a group of high-end talented people on the basis of giving full play to the role of existing talent. Research and optimize permanent residency for foreigners, simplify the procedures for applying for permanent residency for high-level foreign talent, and facilitate residency and entry and exit convenience for their spouses and adolescent children.

All regions and relevant government ministries must attach great importance to the development of strategic emerging industries. Strengthen organizational leadership, speed up work, properly implement this plan, and strengthen the connection between specialized plans, local plans, and this plan. Local people's governments at all levels must establish and improve working mechanisms, refine policies and measures, and promote the implementation of various tasks in this plan. Relevant provinces (autonomous regions and municipalities) are encouraged to jointly prepare regional development plans to promote the differentiated and strategic development of strategic emerging industries. The National Development and Reform Commission must work with the Ministry of Science and Technology, the Ministry of Industry and Information Technology, and the Ministry of Finance and give play to the leading role of the Inter-Ministerial Joint Conference on Strategic Emerging Industry Development (战略性新兴产业发展部际联席会议). Strengthen overall guidance, coordination, and supervision, keep a close track of industry developments, and research and coordinate on major issues in industrial development in a timely manner. All member units of the joint meeting and relevant ministries must actively cooperate. Enforce tasks according to the division of responsibilities. Accelerate the formulation of supporting policies, form a workforce, and work together to promote the development of strategic emerging industries.

Appendix: Key Task Division Plan

Appendix

Key Task Division Plan

No.	Key Task	Responsible Ministry
1	Building an infrastructure for the country to become an internet superpower and organizing the implementation of the broadband rural demonstration project	Led by the Ministry of Industry and Information Technology and National Development and Reform Commission along with Cyberspace Administration of China, Ministry of Commerce, Ministry of Agriculture, Ministry of Finance, and State Administration of Radio, Film, and Television, which are responsible in accordance with the division of responsibilities.
2	Promoting the development of network convergence infrastructure, advancing the integration and interconnection of national cable television networks, and accelerating the construction of next-generation broadcast networks	The Ministry of Industry and Information Technology and State Administration of Radio, Film, and Television are responsible in accordance with the division of responsibilities.
3	Advancing the "Internet Plus" initiative and organizing the implementation of the "Internet Plus" project	Led by the National Development and Reform Commission along with the Ministry of Industry and Information Technology, Ministry of Science and Technology, Ministry of Human Resources and Social Security, Cyberspace Administration of China, Ministry of Agriculture, National Energy Administration, People's Bank of China, Ministry of Commerce, Ministry of Transport, Ministry of Environmental Protection, and State Administration for Industry and Commerce, which are responsible in accordance with the division of responsibilities.
4	Implementing the national big data strategy and organizing the implementation of big data development projects	Led by the National Development and Reform Commission along with the Ministry of Industry and Information Technology, Cyberspace Administration of China, and Ministry of Science and Technology, which are responsible in accordance with the division of responsibilities.
5	Strengthening the core industries of information technology and organizing the implementation of integrated circuit development projects	The National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Science and Technology, Ministry of Finance, Cyberspace Administration of China, and General Administration of Quality Supervision, Inspection and Quarantine are responsible in accordance with the division of responsibilities.
6	Developing artificial intelligence and organizing the implementation of artificial intelligence innovation projects	The National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Finance, and Cyberspace Administration of China are responsible in accordance with the division of responsibilities.

7	Improving network economy management methods, deepening telecommunication system reform, and strengthening the enactment of relevant legislation	The National Development and Reform Commission, Ministry of Industry and Information Technology, State-owned Assets Supervision and Administration Commission of the State Council, Cyberspace Administration of China, Legislative Affairs Office of the State Council, State Administration of Radio, Film, and Television, and State Administration for Industry and Commerce are responsible in accordance with the division of responsibilities.
8	Creating high-end smart manufacturing brands and organizing the implementation of the smart factory application demonstration project for key areas	Led by the Ministry of Industry and Information Technology along with the National Development and Reform Commission, Ministry of Science and Technology, Ministry of Finance, and General Administration of Quality Supervision, Inspection and Quarantine, which are responsible in accordance with the division of responsibilities.
9	Implementing new aviation industry breakthroughs and organizing the implementation of the next-generation civil aviation innovation project	Led by the Ministry of Industry and Information Technology and National Development and Reform Commission along with the Ministry of Science and Technology, Ministry of Finance, and General Administration of Quality Supervision, Inspection and Quarantine, Civil Aviation Administration of China, which are responsible in accordance with the division of responsibilities.
10	Making the satellites and applications industry bigger and stronger and organizing the implementation of spatial information intelligent sensing projects	The National Development and Reform Commission, State Administration for Science, Technology and Industry for National Defense, Ministry of Finance, Ministry of Science and Technology, Ministry of Industry and Information Technology, Cyberspace Administration of China, General Administration of Quality Supervision, Inspection and Quarantine, and Chinese Academy of Sciences are responsible in accordance with the division of responsibilities.
11	Strengthening the leading position of rail transit equipment	The National Development and Reform Commission, Ministry of Transport, National Railway Administration, China Railway Corporation, Ministry of Housing and Urban-Rural Development , Ministry of Science and Technology, Ministry of Industry and Information Technology, State-owned Assets Supervision and Administration Commission of the State Council, and General Administration of Quality Supervision, Inspection and Quarantine are responsible in accordance with the division of responsibilities.
12	Enhancing the international competitiveness of marine engineering equipment and organizing the implementation of the marine engineering equipment innovation and development project	The National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Science and Technology, Ministry of Finance, General Administration of Quality Supervision, Inspection and Quarantine, State Administration for Science, Technology and Industry for National Defense, and State Oceanic Administration are responsible in accordance with the division of responsibilities.

13	Improving the basic support capacity of new materials and organizing the implementation of the new materials upgrade and synergistic applications project	Led by the Ministry of Industry and Information Technology and National Development and Reform Commission along with the Ministry of Science and Technology, Ministry of Finance, General Administration of Quality Supervision, Inspection and Quarantine, State Administration for Science, Technology and Industry for National Defense, and State Oceanic Administration, which are responsible in accordance with the division of responsibilities.
14	Building a new biotech pharmaceutical system and organizing the implementation of the new drug creation and industrialization project	The National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Science and Technology, National Health Commission, Ministry of Finance, State Food and Drug Administration, and National Administration of Traditional Chinese Medicine are responsible in accordance with the division of responsibilities.
15	Enhancing the development level of biomedical engineering and organizing the implementation of the beneficial biotechnology project	The National Development and Reform Commission, Ministry of Industry and Information Technology, National Health Commission, State Food and Drug Administration, Ministry of Finance, National Administration of Traditional Chinese Medicine, and State Oceanic Administration are responsible in accordance with the division of responsibilities.
16	Accelerating the industrialization of biotech agriculture	The Ministry of Agriculture, National Development and Reform Commission, and Ministry of Science and Technology are responsible in accordance with the division of responsibilities.
17	Advancing biotech manufacturing technology to penetrate the chemical, materials, and energy fields	The National Development and Reform Commission, Ministry of Industry and Information Technology, and Ministry of Science and Technology are responsible in accordance with the division of responsibilities.
18	Cultivating new forms of biotech services	The National Development and Reform Commission, Ministry of Industry and Information Technology, and National Health Commission are responsible in accordance with the division of responsibilities.
19	Organizing the implementation of the biotech industry innovation development platform building project	Led by the National Development and Reform Commission along with the Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Finance, National Health Commission, State Food and Drug Administration, General Administration of Quality Supervision, Inspection and Quarantine, and State Oceanic Administration, which are responsible in accordance with the division of responsibilities.
20	Creating models for the development of bioenergy	The National Energy Administration, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Finance, Ministry of Agriculture, and State Oceanic Administration are responsible in accordance with the division of responsibilities.

21	Organizing the implementation of the new energy vehicle automotive battery upgrade project	Led by the Ministry of Industry and Information Technology, National Development and Reform Commission, and Ministry of Science and Technology along with the Ministry of Finance, General Administration of Quality Supervision, Inspection and Quarantine, and National Energy Administration, which are responsible in accordance with the division of responsibilities.
22	Promoting new energy industry development and organizing the implementation of the new energy high-proportional development project	Led by the National Energy Administration along with the National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, and Ministry of Finance, which are responsible in accordance with the division of responsibilities.
23	Rigorously promoting the development of high-efficiency and energy-saving industries and organizing the implementation of energy-saving technology and equipment development projects	Led by the National Development and Reform Commission along with the Ministry of Industry and Information Technology, Ministry of Finance, Ministry of Commerce, and General Administration of Quality Supervision, Inspection and Quarantine, which are responsible in accordance with the division of responsibilities.
24	Accelerating the development of advanced environmental protection industries	The National Development and Reform Commission, Ministry of Environmental Protection, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Agriculture, and State Oceanic Administration are responsible in accordance with the division of responsibilities.
25	Organizing the implementation of the green low-carbon technology comprehensive innovation demonstration project	Led by the National Development and Reform Commission along with the Ministry of Science and Technology, Ministry of Industry and Information Technology, National Energy Administration, Ministry of Finance, Ministry of Environmental Protection, Ministry of Housing and Urban-Rural Development, Ministry of Agriculture, and General Administration of Quality Supervision, Inspection and Quarantine, which are responsible in accordance with the division of responsibilities.
26	Deeply advancing resource recycling and organizing the implementation of the resource recycling alternative system demonstration project	Led by the National Development and Reform Commission along with the Ministry of Environmental Protection, Ministry of Industry and Information Technology, Ministry of Finance, Ministry of Housing and Urban-Rural Development, Ministry of Agriculture, and Ministry of Commerce, which are responsible in accordance with the division of responsibilities.
27	Creating digital cultural and creative technology and organizing the implementation of the cultural and creative technology and equipment innovation enhancement project	The Ministry of Industry and Information Technology, Ministry of Culture, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Finance, State Administration of Radio, Film, and Television, and Cyberspace Administration of China are responsible in accordance with the division of responsibilities.

28	Enriching the content and forms of digital culture and creativity and organizing the implementation of the digital content innovation and development project	The Ministry of Culture, Ministry of Industry and Information Technology, State Administration of Radio, Film, and Television, Cyberspace Administration of China, Ministry of Science and Technology, National Development and Reform Commission, and Ministry of Finance are responsible in accordance with the division of responsibilities.
29	Raising the level of innovative design and organizing the implementation of the innovative design development project	The Ministry of Industry and Information Technology, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Culture, Ministry of Housing and Urban-Rural Development, and Ministry of Finance are responsible in accordance with the division of responsibilities.
30	Preparing the groundwork for strategic industries and achieving breakthroughs in the core areas of air and sea, information networks, life sciences, and nuclear technology	The Ministry of Science and Technology, National Development and Reform Commission, Ministry of Industry and Information Technology, State Administration for Science, Technology and Industry for National Defense, Ministry of Finance, Chinese Academy of Engineering, Chinese Academy of Sciences, National Energy Administration, and State Oceanic Administration are responsible in accordance with the division of responsibilities.
31	Promoting the cluster development of strategic emerging industries	The National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Finance, and Ministry of Commerce are responsible in accordance with the division of responsibilities.
32	Actively establishing international collaboration mechanisms and promoting the signing and implementation of intergovernmental cooperation agreements on emerging industries and innovation Promoting bilateral mutual recognition personnel qualifications and product standards, certification, and accreditation results and participating in international multilateral cooperation and mutual recognition mechanisms	The Ministry of Commerce, National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Science and Technology, Ministry of Industry and Information Technology, General Administration of Quality Supervision, Inspection and Quarantine, State Administration for Science, Technology and Industry for National Defense, and State Oceanic Administration are responsible in accordance with the division of responsibilities.
33	Establishing bilateral international cooperation parks for distinctive industries and raising the level of open cooperation in key areas, focusing on developed countries and countries along the Belt and Road	Led by the Ministry of Commerce along with the National Development and Reform Commission and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.
34	Building a global innovation and development network	The National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce, Ministry of Science and Technology, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
35	Advancing the streamlining of administration, delegation of power,	The National Development and Reform Commission, Ministry of Industry and Information Technology,

	strengthening of regulations, and improvements in service reform, distinguishing between different situations, and actively exploring and innovating regulatory methods that are suitable for the development of new technologies, new products, new formats, and new models	Ministry of Civil Affairs, Ministry of Transport, Ministry of Culture, People's Bank of China, General Administration of Customs, State Administration for Industry and Commerce, General Administration of Quality Supervision, Inspection and Quarantine, State Administration of Radio, Film, and Television, China Banking Regulatory Commission, China Securities Regulatory Commission, and China Insurance Regulatory Commission are responsible in accordance with the division of responsibilities.
36	Leading pilot demonstrations of mixed-ownership reform in state-owned enterprises in strategic emerging industries and carrying out employee shareholding experiments in mixed-ownership enterprises	Led by the National Development and Reform Commission along with the State-owned Assets Supervision and Administration Commission of the State Council, Ministry of Finance, and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.
37	Promulgating a catalog of key products and services for strategic emerging industries	Led by the National Development and Reform Commission along with the Ministry of Industry and Information Technology, Ministry of Commerce, and Ministry of Culture, which are responsible in accordance with the division of responsibilities.
38	Improving supporting legislation under the anti-monopoly law, further increasing anti-monopoly and anti-unfair competition law enforcement, and seriously investigating and dealing with corporate violations in the fields of information services and medical services	The National Development and Reform Commission, Ministry of Commerce, State Administration for Industry and Commerce, Ministry of Industry and Information Technology, and National Health Commission are responsible in accordance with the division of responsibilities.
39	Establishing sound working mechanisms, ensuring the orderly implementation of a fair competition review system, breaking past bottlenecks and industry monopolies in areas such as renewable energy power generation, medical equipment, and drug bidding, and strengthening the investigation and punishment of local protectionism and monopolistic industry behavior	The National Development and Reform Commission, Legislative Affairs Office of the State Council, Ministry of Commerce, State Administration for Industry and Commerce, Ministry of Finance, National Health Commission, and National Energy Administration are responsible in accordance with the division of responsibilities.
40	Establishing high-level government-enterprise dialog and consultation mechanisms and actively listening to corporate opinions when researching and formulating relevant policy measures	The National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Science and Technology, Ministry of Finance, and Ministry of Commerce are responsible in accordance with the division of responsibilities.
41	Deeply carrying out widespread entrepreneurship and innovation, building platforms for crowd creation, crowdsourcing, crowd support, and crowdfunding, supporting the construction of "entrepreneurship and innovation" demonstration bases, and developing a professional space for innovation. Relying on the internet to create open and shared	The National Development and Reform Commission, Ministry of Science and Technology, Ministry of Human Resources and Social Security, Ministry of Finance, Ministry of Industry and Information Technology, and Chinese Academy of Sciences are responsible in accordance with the division of responsibilities.

	innovation mechanisms and innovation platforms and promoting synergistic innovation among enterprises, scientific research institutions, universities, creators, and other innovators.	
42	Implementing a number of major scientific and technological projects and major works to strengthen the research, development, and industrialization of disruptive technologies	The Ministry of Science and Technology, National Development and Reform Commission, Ministry of Industry and Information Technology, Cyberspace Administration of China, State Administration for Science, Technology and Industry for National Defense, Ministry of Finance, Chinese Academy of Engineering, and Chinese Academy of Sciences are responsible in accordance with the division of responsibilities.
43	Strengthening the construction of public service platforms for measurement and testing, inspection and testing, certification and accreditation, and knowledge and data centers	The General Administration of Quality Supervision, Inspection and Quarantine, National Development and Reform Commission, Ministry of Science and Technology, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
44	Implementing and improving standardized development planning for strategic emerging industries, improving the system of standards, and supporting the application of new technology standards in key areas	The General Administration of Quality Supervision, Inspection and Quarantine, Ministry of Science and Technology, National Development and Reform Commission, Ministry of Industry and Information Technology, and Cyberspace Administration of China are responsible in accordance with the division of responsibilities.
45	Strengthen the capacity building of enterprise technology centers and promoting the top 100 projects of innovative enterprises	The National Development and Reform Commission, Ministry of Science and Technology, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
46	Implementing tax incentives such as deductions for research and development expenses and guiding enterprises to increase investment in research and development	The Ministry of Finance, State Taxation Administration, and Ministry of Science and Technology are responsible in accordance with the division of responsibilities.
47	Improving upon the transfer and transformation system for scientific and technological achievements and organizing the implementation of the scientific and technological achievements transfer and optimization initiative. Accelerating the establishment of performance evaluations and annual reporting systems for the transfer of scientific and technological achievements.	The Ministry of Science and Technology, Ministry of Finance, Ministry of Education, National Development and Reform Commission, Ministry of Industry and Information Technology, and Chinese Academy of Sciences are responsible in accordance with the division of responsibilities.
48	Exploring the preliminary transformation of scientific and technological achievements formed by the use of fiscal funds in strategic emerging industries	Led by the Ministry of Science and Technology, Ministry of Finance, and National Development and Reform Commission along with the Ministry of Education and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.

49	Actively advancing the revision of the Patent Law and the Copyright Law. Tracking the development and innovation of new technologies, new formats, and new models, improving relevant legislation on business model intellectual property protections, trade secret protections, and practical art design patent protections. Promoting higher limits for statutory compensation for intellectual property infringement.	The National Intellectual Property Administration, State Administration of Radio, Film, and Television, Legislative Affairs Office of the State Council, Ministry of Science and Technology, and State Administration for Industry and Commerce are responsible in accordance with the division of responsibilities.
50	Strengthening intellectual property rights protections and safeguards. Building a number of rapid rights protection centers Incorporating international intellectual property rights infringement on social credit records, improving mechanisms for investigating and dealing with intellectual property rights and administrative infringement, strictly cracking down on intellectual property rights in accordance with the law, and increasing customs enforcement on intellectual property rights.	Led by the National Intellectual Property Administration along with the Ministry of Industry and Information Technology, National Development and Reform Commission, Ministry of Public Security, State Administration for Industry and Commerce, and General Administration of Customs, which are responsible in accordance with the division of responsibilities.
51	Implementing strategic advancement plans for the intellectual property rights industry for strategic emerging industries, deploying the intellectual property rights service chain around strategic emerging industry clusters, establishing intellectual property rights cluster management systems, cultivating a group of specialized and branded intellectual property rights service agencies, and promoting the formation of a group of clusters with intellectual property rights advantages	The National Intellectual Property Administration, National Development and Reform Commission, Ministry of Science and Technology, State Administration for Industry and Commerce, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
52	Improving the overseas system of intellectual property rights services, establishing an early warning mechanism for overseas intellectual property rights risks, and providing intellectual property rights support for enterprises that carry out overseas mergers, acquisitions, and rights protection activities	The Ministry of Commerce, National Intellectual Property Administration, Ministry of Foreign Affairs, National Development and Reform Commission, Ministry of Industry and Information Technology, and State Administration for Industry and Commerce are responsible in accordance with the division of responsibilities.
53	Actively supporting the listing or public financing of qualified enterprises in strategic emerging industries, researching and launching the national share transfer system for the listing of companies on the growth enterprises market board, and establishing a joint docking mechanism between the national share transfer system and the regional equity market	The China Securities Regulatory Commission, National Development and Reform Commission, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.

54	Actively supporting the issuance of bond financing by qualified enterprises in strategic emerging industries, expanding the scale of credit enhancement bonds for small and micro-sized enterprises and collective bills for small and medium-sized enterprises, encouraging the exploration and development of financial products such as high-yield bonds and convertible bonds, and steadily promoting the development of debt financing instruments for non-financial enterprises	The People's Bank of China, National Development and Reform Commission, and China Securities Regulatory Commission are responsible in accordance with the division of responsibilities.
55	Guiding financial institutions to actively improve credit management and loan review systems that are adapted to the characteristics of strategic emerging industries. Encouraging the establishment of a system for determining, assessing, pledging, and transferring intangible assets in digital creative, software, and other areas and advancing financial product innovation, such as intellectual property rights pledge financing, equity pledge financing, supply chain financing, and technology insurance.	Led by the People's Bank of China and China Banking Regulatory Commission along with the China Securities Regulatory Commission, China Insurance Regulatory Commission, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Culture, State Administration for Industry and Commerce, and National Intellectual Property Administration, which are responsible in accordance with the division of responsibilities.
56	Exploring the establishment of an investment and financing information service platform for strategic emerging industries to connect banks to enterprises	The National Development and Reform Commission, Ministry of Industry and Information Technology, China Banking Regulatory Commission, and People's Bank of China are responsible in accordance with the division of responsibilities.
57	Guiding policy and development financial institutions towards increasing support for strategic emerging industries	The People's Bank of China, China Banking Regulatory Commission, National Development and Reform Commission, Ministry of Finance, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
58	Promoting the development of a number of financial leasing and lending companies that cater to such industries as the aircraft, marine engineering equipment, and robotics industries	The Ministry of Commerce, China Banking Regulatory Commission, National Development and Reform Commission, Ministry of Industry and Information Technology, State Oceanic Administration, and Civil Aviation Administration of China are responsible in accordance with the division of responsibilities.
59	Accelerating the establishment of a national financing guarantee fund to support the financing of strategic emerging industry projects	The Ministry of Finance, National Development and Reform Commission, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
60	Encouraging regions with the right conditions to set up strategic emerging industry development funds and guiding community investment to set up a number of strategic emerging industry investment funds and international investment funds	The National Development and Reform Commission, Ministry of Finance, China Securities Regulatory Commission, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.

61	Improving government procurement policies, increasing support for "entrepreneurship and innovation" and cloud computing, big data, and the recycling economy, and advancing demonstration applications, such as smart cities, information-for-citizens, "urban mines," and smart equipment	Led by the Ministry of Finance, along with the National Development and Reform Commission, Ministry of Science and Technology, and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.
62	Further improving subsidies for renewable energy power generation such as photovoltaics, wind power, and biomass Adjusting and improving subsidy policies for new energy vehicles	The National Development and Reform Commission, Ministry of Finance, National Energy Administration, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
63	Implementing the leading innovative talent initiative, focus on key areas for strategic emerging industries, building a group of innovative talent training demonstration bases based on major projects and major works, and supporting a group of science and technology innovators and entrepreneurs Introducing and training a group of high-end talented people on the basis of giving full play to the role of existing talent	The Ministry of Human Resources and Social Security, Organization Department of the CPC Central Committee, Ministry of Education, Ministry of Science and Technology, and National Development and Reform Commission are responsible in accordance with the division of responsibilities.
64	According to the needs of industrial development, dynamically adjusting the teaching content and curriculum of colleges and universities and reasonably expanding the proportion of enrollment associated with strategic emerging industries	Led by the Ministry of Education along with the Ministry of Industry and Information Technology, they are responsible in accordance with the division of responsibilities.
65	Relying on the knowledge and expertise of professional and technical personnel to update projects, training a large number of high-level, urgently-needed talented people and key professional and technical personnel to build a number of national-level continuing education bases	The Ministry of Human Resources and Social Security, Ministry of Education, and Ministry of Industry and Information Technology are responsible in accordance with the division of responsibilities.
66	Guiding and supporting scientific research personnel in the public sector to carry out innovative work or to start businesses in accordance with relevant state regulations	Led by the Ministry of Human Resources and Social Security, Ministry of Science and Technology, and Ministry of Education along with the National Development and Reform Commission and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.
67	Setting up a group of post-doctoral research work stations in enterprises in strategic emerging industries to encourage the development of key core technologies in those industries	Led by the Ministry of Human Resources and Social Security along with the Ministry of Education and Ministry of Science and Technology, which are responsible in accordance with the division of responsibilities.
68	Researching and optimizing permanent residency for foreigners, simplifying the procedures for applying for permanent residency for high-level foreign talent, and	The Ministry of Public Security and Ministry of Human Resources and Social Security are responsible in accordance with the division of responsibilities.

	facilitating residency and entry and exit convenience for their spouses and adolescent children	
69	Conducting statistical monitoring surveys of strategic emerging industries	Led by the National Bureau of Statistics of China along with the National Development and Reform Commission and Ministry of Industry and Information Technology, which are responsible in accordance with the division of responsibilities.