

Name of the matter to be disclosed: Notice of the *People's Government of Henan Province on printing and distributing the strateg  
industries and future industrial development plan of Henan Province during the 14th Five-Year Plan*

Document number: Yuzheng [2021] No. 50

Organizer: People's Government of Henan Province

Index number: 10010-0100-2022-00008

Date of writing: 2022-04-15

Published: December 2021, 12

Failure time:

Effectiveness: effective

Notice of the People's Government of Henan Province  
printing and distributing the  
strategic emerging industries and  
future industrial development plan of Henan Provin  
during the 14th Five-Year Plan

Yuzheng [2021] No. 50

The people's governments of all provinces and municipalities, the administrative committee  
Jiyuan Demonstration Zone, and the departments of the provincial people's government:  
The "14th Five-Year Plan for Strategic Emerging Industries and Future Industry Development  
Henan Province" is hereby issued to you, please seriously implement it.

People's Government of Henan P

December 2

Henan Province "14th Five-Year Plan" strategic emerging industries and  
Future industrial development planning

The "14th Five-Year Plan" period is a key period for our province to start a new journey of  
comprehensively building socialist modernization in Henan, compose a more brilliant chapter  
the Central Plains in the new era, and also promote high-quality development and accelerate  
transformation from large to strong. It is of great significance to vigorously cultivate  
strategic emerging industries and plan for the layout of future industries, which is not or  
important measure to promote the high-quality development of the manufacturing industry and

enhance the strategic position of our province, but also a strong support for accelerating construction of a modern economic system and comprehensively shaping new advantages for development, and it is also a major strategic choice to build a modern and strong province respond to global changes and challenges. This plan is formulated in accordance with the spirit of the 14th Five-Year Plan for the Development of National Strategic Emerging Industries, the 14th Five-Year Plan for the National Economic and Social Development of Henan Province and Outline of the Long-term Goals for 2035.

First, based on the new stage, plan a new blueprint for the development of strategic emerging industries

(2016) Development foundation. Since <>, our province has deeply implemented the innovation-driven development strategy, continuously optimized the industrial development environment, cultivated and expanded a number of high-quality enterprises and industrial clusters with characteristics and great development potential, promoted the large-scale, high-end and agglomeration development of strategic emerging industries, and future-based industries such as quantum information and hydrogen energy have also shown a breakthrough development trend, becoming an important engine to promote the high-quality economic development of the province. The level of industrial development has been continuously improved. During the "Thirteenth Five-Year Plan" period, the added value of strategic emerging industries in our province grew at an average annual rate of 10.4%, which was 4.2 percentage points higher than the average annual growth rate of the added value of industries above designated size in the same period; the proportion of added value of industries above designated size reached 22.4%, an increase of 2015.10 percentage points over 6. Initially built the world's important intelligent terminal manufacturing base, agricultural machinery equipment, aviation bearings, diagnostic reagent blood products, intelligent sensors and other R & D and industrialization at the upstream level of the country, in the shield, new energy buses, optical communication chips, superhard materials, influenza vaccine and other fields of technical level in the country leading, market share ranked first in the country, the province's emerging industries showed an accelerated development trend, initially formed a pattern of dislocation development and complementary advantages.

Innovation-driven development has achieved remarkable results. Zhengluoxin National Independent Innovation Demonstration Zone has made significant progress in the construction, the number of high-tech enterprises has more than quadrupled, the number of national innovation platforms reached 172, the National Biological Breeding Industry Innovation Center, the National Agricultural Machinery Equipment Manufacturing Innovation Center, the National Supercomputing Center Zhengzhou Center, the National Technology Transfer Zhengzhou Center, etc. have settled in our province, the Zhengzhou Branch of the Institute of Computing of the Chinese Academy of Sciences, the Sino-German Intelligent Industry Research Institute and other high-level research institutions have been built, and a number of innovative achievements and equipment have been built in Jiaolong. Application in major projects such as the Hong Kong-Zhuhai-Macao Bridge. In 2020, the province's research and experimental development (R&D) expenditure exceeded 850 billion yuan, double that of 2015; There are 4.5 invention patents per 384,5 people, and the transaction amount of technology contracts is 2015.2 billion yuan, which are 3.8 times and 4.60 times that of 2015, respectively; the contribution rate of scientific and technological progress has reached

than <>%. Remarkable results have been achieved in the development of entrepreneurship and entrepreneurship, with outstanding achievements in the construction of <> national innovation demonstration bases including Zhengzhou High-tech Zone and Luoyang High-tech Zone. The number of market entities in the dual innovation market ranks first in the six central provinces.

The advantages of chain clustering are gradually emerging. Focusing on the fields of new generation information technology, biomedicine, intelligent sensors, intelligent equipment, energy and intelligent networked vehicles, we deploy an innovation chain around the industrial chain, optimize the industrial development ecology, and gradually form a number of strategic emerging industrial clusters with distinctive characteristics. The leading role of national strategic emerging industrial clusters such as Zhengzhou's next-generation information network and information technology services, Xuchang energy conservation and environmental protection and Pingdingshan new functional materials has been further highlighted. The modernization of ten emerging industrial chains, such as new displays and intelligent terminals, and a new generation of artificial intelligence, has gradually improved, and the support capacity of links in the industrial chain has been continuously enhanced.

Cutting-edge technology accelerates breakthrough development. Our province is one of the provinces in China that paid attention to and advanced the layout of cutting-edge technologies such as quantum information and hydrogen fuel cells, and has leading advantages in some fields such as hydrogen energy and energy storage, quantum communication, future networks and brain intelligence, and the future industry presents a point-like layout and breakthrough development trend. The Information Engineering University of the Strategic Support Force of the Chinese People's Liberation Army (hereinafter referred to as the Information Engineering University) obtained a number of patents in the fields of brain-computer interaction and multimodal brain signal analysis, and ranks first in the country in mimicry defense, quantum communication, quantum computers, etc. Yutong Bus obtained the industry's first hydrogen fuel cell bus product announcement, and Henan Battery Research Institute and Tongji University cooperated to build demonstration line with an annual output of 500 sets (40 kW) of hydrogen fuel cell stacks. The number of scientific and technological human resources and industrial skilled workers in the province ranks first in the country, and it has a large-scale talent reserve and consumer market which plays an obvious role in driving future industrial development.

(2) Facing the situation. At present and for some time to come, the world's unprecedented changes in a century have accelerated and evolved, the international and domestic development environment has undergone profound changes, and the severity and complexity are unprecedented, which has forward new problems and challenges for the development of strategic emerging industries and future industries, ushered in new opportunities and pointed out new directions.

Growth opportunities. At present, a new round of scientific and technological revolution and industrial transformation in the world is accelerating, global scientific and technological innovation has entered an unprecedented intensive and active period, and cutting-edge technologies have shown a concentrated breakthrough trend. During the "14th Five-Year Plan" period, the state accelerated the expansion of a new generation of strategic emerging industries such as information technology, biotechnology, new energy, new materials, and high-end equipment and prospectively planned future industries such as brain-like intelligence, quantum information

gene technology, future networks, deep-sea aerospace development, hydrogen energy and energy storage, and pointed out the path direction for the province to develop strategic emerging industries and future industries. The three national strategies of building a new development pattern, promoting high-quality development in the central region, ecological protection and high-quality development of the Yellow River Basin converge and superimpose, and further optimize the development environment of strategic emerging industries and future industries. The economy has entered a period of steady growth, the income of urban and rural residents has steadily increased, and the people's yearning for a better life has formed a favorable effect for the accelerated growth and development of strategic emerging industries and future industries. Face challenges. The global industrial cooperation pattern has been reconstructed, developed countries and emerging countries have gradually changed from dislocation competition to free competition, international technical trade barriers continue to increase, and the international environment for the development of advanced manufacturing industry tends to be complex. The economic volume of our province has ranked fifth in the country for many consecutive years, there are still outstanding problems such as weak innovation driving ability and poor industrial structure, and it is in a critical stage of continuous conversion of old and new kinetic energy. In the face of the watershed of weakening old forces and new forces, only by focusing on solving structural contradictions, vigorously developing strategic emerging industries, and breaking through the development of future industries can we fully enter the track of high-quality development.

On the whole, the "14th Five-Year Plan" period is a key period and a period for the development of strategic emerging industries and future industries in our province, and accelerating the development of strategic emerging industries and future industries is related to the overall situation of high-quality development, and it must be regarded as the top priority of economic development, concentrate resources and elements to accelerate promotion, and build strategic emerging industries and future industries into an important engine for the high-quality development of the province.

(4) Guiding ideology. Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, deeply implement the spirit of the 5th CPC National Congress and the 6th, 7th, 8th and 9th Plenary Sessions of the 10th CPC Central Committee, deeply study and implement the important instructions of General Secretary Xi Jinping's important speech during his visit to Henan, focus on the "two guarantees" goal and the "Ten Strategies" measures, adhere to the general tone of seeking progress while maintaining stability, scientifically grasp the new development stage, complete, accurate and comprehensive implementation of the new development concept, seize the strategic opportunity to build a new development pattern, and promote high quality development as the theme. With deepening supply-side structural reform as the main line, expanding domestic demand as the strategic base point, and meeting the people's growing need for a better life as the fundamental purpose, we put innovation at the logical starting point of development and the core position of modernization, focus on innovation, strengthen the main body, cultivate clusters, promote integration, expand opening up, optimize ecology, and improve energy levels, grafting <> dominant industries with advantages at a high level, seizing the <> high-growth industries, forward-looking layout of <> future industries, and promoting the coupling of industrial chain, innovation chain, supply chain, factor chain and institutional

chain. Build a strategic emerging industry and future industrial system with core competitiveness, realize the overall leap of strategic emerging industries and future industries, promote our province to "strive for the first and be more brilliant" in the high-quality development of the central region, and highlight Henan's responsibility and make greater contributions in serving the overall development of the country.

#### (4) Main principles.

Innovation-driven, key breakthroughs. Gather innovation resources, accelerate the research and development of core technologies, the transformation of major scientific and technological achievements and the iterative application of independent innovative products, concentrate on breaking through a number of "stuck neck" technologies with independent property rights, safety and controllability, promote the systematic breakthrough of the complementary chain and strengthen the chain extension with points and surfaces, and create an industrial chain supply chain with stronger innovation, higher added value, safer and more reliable.

Open cooperation and integrated development. Focus on the forefront of scientific and technological change and new trends in industrial development, take the initiative to dock with innovation advantageous regions such as the Yangtze River Delta, Beijing-Tianjin-Hebei, and Guangdong-Hong Kong-Macao Greater Bay Area, actively integrate into the national "Belt and Road" science and technology innovation action plan, attract major scientific and technological achievements at home and abroad to be transformed in our province, and fully integrate into the national emerging industry development pattern.

Optimize ecology and stimulate vitality. Build a more complete institutional mechanism for market-oriented allocation of factors, break down institutional barriers that hinder the free flow of talents, technology and capital, strengthen the ability of finance to support industrial development, guide the coordinated agglomeration of various factors to strategic emerging industries, create a stable, fair, transparent and predictable business environment, and stimulate the potential of industrial development and the vitality of market entities.

Scientific layout, industrial agglomeration. Adhere to the intensive development model, coordinate to optimize the industrial layout, promote the effective agglomeration and supply of talent, technology and capital, promote the deep integration between various fields of strategic emerging industries, between strategic emerging industries and future industries, and between strategic emerging industries and traditional industries, and form a number of emerging industrial clusters with strong innovation ability, excellent entrepreneurial environment and strong competitiveness. Demand-led, supply and demand. Give full play to the advantages of market scale, create new demand through high-quality supply adaptation, cultivate new formats, create new models, stimulate new consumption, promote the release of new consumption and the development of new consumption industry system, and form a higher level of dynamic balance between demand driving supply and supply creating demand.

(2025) Development goals. By 2025, the comprehensive strength of strategic emerging industries will lead in the central and western regions, and the leading role of future industries will initially appear, basically forming an emerging industrial system with independent technology support, becoming the leading force leading the high-quality development of the province.

The scale of the industry has reached a new level. The scale of strategic emerging industries has doubled, and the added value accounts for more than 30% of the added value of industries at

designated size; Major breakthroughs have been made in the future industry, with added value accounting for more than 15% of the added value of strategic emerging industries; It has formed a number of pillar industries in the fields of new generation information technology, biotechnology, new materials, energy conservation and environmental protection, and has become a new driving force for the economic development of the province.

New breakthroughs have been made in independent innovation. In accordance with the principle "strengthening reserves, establishing echelons, and creating peaks", we will build about 10 provincial laboratories, strive to create national laboratories or branches (bases) in advantageous fields such as seed industry and new-generation information technology, and strive to create 5 national key laboratories. Build 100 high-level innovation platforms, focus on overcoming a number of industrial common technologies and "stuck neck" technologies in key areas, significantly improve the overall efficiency of the industrial chain, and rank among the forefront of innovation in key areas.

Chain clusters form a new pattern. The modernization level of the industrial chain has been continuously improved, forming 10 advantageous strategic emerging industrial chains such as intelligent equipment, biomedicine, new energy, energy conservation and environmental protection. Cultivate and introduce 100 leading enterprises, add a number of national and provincial strategic emerging industrial clusters, and create 10 domestic competitiveness <> billion strategic emerging industrial clusters.

The industrial ecology has presented a new situation. Important progress has been made in the reform of key areas and key links, breaking through a number of institutional barriers that affect the development of strategic emerging industries, continuously improving the mechanism of steady investment of government funds, accelerating the layout of strategic emerging industries and increasing investment in state-owned enterprises and private enterprises, integrating industrial capital with various funds such as angel venture capital and venture capital more closely, the scale of innovative capital exceeding 3000 billion yuan, bringing together financial resources such as banking, securities, and insurance exceeding one trillion yuan, and initially establishing a significant improvement in innovation efficiency. An innovation ecosystem where innovation is bursting with energy. The regulations, credit and standard systems have been further improved, the market environment has become fairer, and the industrial ecology that emerged to adapt to new models and new formats has been more optimized.

By 2035, a relatively complete future industrial system will be basically established, strategic emerging industries will become a decisive force to promote the sustainable and high-quality economic and social development of our province, and a number of strategic emerging industrial agglomeration areas with innovation leadership, factor enrichment and spatial intensification will be cultivated, and a new highland for the development of strategic emerging industries and future industries in the country will become a new highland.

Second, improve the basic capacity of the industry, and make the leading industry better and stronger

Focus on a new generation of information technology, biotechnology, new materials, energy conservation and environmental protection and other advantageous leading industries, vigorously build a chain extension chain to supplement the chain and strengthen the chain, accelerate the introduction and cultivation of a number of head enterprises and parts enterprises with core

technologies, improve the level of the industrial chain and independent controllable ability, comprehensively enhance brand influence and market competitiveness, highlight the creation of a number of leading industrial clusters with excellent layout and structure, large scale, good extension and support, and strong support and drive.

(2025) A new generation of information technology industry. Focus on "core supplementation, screen introduction, fixed network, strong end, and incubator", strengthen innovation in key areas such as information manufacturing, information infrastructure and information security, promote the deep integration of big data, artificial intelligence, blockchain and other technologies and the real economy, and build an industrial development ecology of the Internet. Everything, integrated innovation, intelligent collaboration, green and safe. By 2025, the operating income of the new generation information technology industry will exceed 10 trillion yuan. Improve manufacturing capabilities in the information field. IC. Adhere to the development characteristics and differentiation, accelerate the layout and construction of large-scale characteristic process production lines and advanced process production lines, promote integrated circuit design, special chip manufacturing packaging research and development and industrialization, focus on the development of optical communication chips, power management chips, etc., and build special chip industries and packaging and testing bases. Accelerate the development of large-size monocrystalline silicon polishing wafers, electronic-grade high-purity silicon materials, zone-molten silicon single crystal, silicon carbide (SiC), gallium nitride (GaN), gallium arsenide (GaAs) and other semiconductor material products, and promote the research and development and industrialization of new sensitive materials and composite functional materials. Promote the industrialization of special equipment such as semiconductor packaging and testing chips, grinding plates, and polishing. New display and smart terminal. Adhere to the "leading drive, screen-end linkage, cluster supporting, chain extension", introduce and cultivate high-end display products such as high-generation thin-film transistor liquid crystal display devices (TFT-LCD), active matrix organic light-emitting diode display devices (AMOLED), and prospectively layout new display products such as micro-LED display devices (micro-LED), quantum dots, and printed displays, consolidate and improve the production capacity of high-end smartphones, and realize equal emphasis and chain development of screen-end products. Actively develop new intelligent terminal products such as digital audio and video, smart home, smart security, smart wearable devices, and augmented/virtual reality (AR/VR) based on 5G technology, cultivate the ultra-high-definition video industry, and promote the agglomeration of upstream and downstream supporting industries. Advanced computing. Accelerate the development of independent and controllable computing industry, deepen cooperation with leading enterprises in the industry, actively undertake the transfer of server and computer industries, build hardware production bases for computing industry such as Xuchang Huanghe Kunpeng, and build a 100-billion-level industrial cluster. Smart sensors. Promote the accelerated construction of the Provincial Intelligent Sensor Industry Research Institute and pilot base, support the construction of Zhengzhou China Intelligent Sensor Valley and Kaifeng, Luoyang, Xinxiang, Hebi, Sanmenxia and Nanyang Intelligent Sensor Industrial Parks, and strive to cultivate a number of enterprises with strong innovation ability and obvious competitive advantages in subdivided fields such as intelligent sensor materials, equipment and packaging, and promote the development of the whole intelligent sensor industry chain. Support leading enterprises to break through core key

technologies, improve the independent research and development, design and manufacturing capabilities of core chips such as microelectromechanical system (MEMS) process chips, and industrial innovation and development. Other electronic components. In line with the development trend of new components such as high frequency, high speed, chip, miniaturization, low power consumption, and multi-function, we introduce and implement key component supporting projects such as camera modules, connectors, filters, ceramic capacitors, discrete devices, super-thin functional films, and optical filters, and actively guide leading enterprises to support them locally.

Vigorously develop high-end software. Basic software. Increase support for the development and application of basic software technologies and products such as operating systems, database middleware, and office software, and vigorously develop basic software platforms for new intelligent terminals and intelligent equipment, and major integrated application platforms and applications in various industries. Improve the level of industrial software development, and develop a number of industrial software products such as industrial operating systems and industrial big data management systems. Promote the development of "cloudification" new form of industrial software, encourage leading enterprises to open application development platform and support qualified enterprises to directly develop cloud-native products. Application software. Facing the application needs of major industries and fields, accelerate the integration and innovative application of software and the Internet, the Internet of Things, the fifth generation of mobile communication technology (5G), big data, cloud computing, artificial intelligence, virtual reality, blockchain and other new-generation information technologies to build an intelligent software industry ecosystem around the needs of key industries such as government affairs, finance, medical care, education, culture, and industry. Build a number of software industrial parks and strive to create a national-level software park. Strive to introduce a number of industry backbone enterprises, promote the agglomeration and development of the software industry, and support the creation of "Chinese software characteristic cities" in places with conditions.

Improve the information infrastructure. 5G. Promote the construction of 5G independent networking (SA) networks, achieve full coverage of 5G networks above township levels, gradually realize continuous coverage of 5G networks in important transportation hubs, school venues, industrial parks and other scenarios, coordinate the construction of base station sites, radio access subsystems, power and other supporting facilities, promote the opening and sharing of social and public resources to 5G network facilities, and promote multi-pole integration. In-depth implementation of the "5G+" demonstration project, in the fields of intelligent manufacturing, modern agriculture, modern service industry, smart city, medical and health, smart energy and smart environmental protection and other fields to create a number of benchmark application scenarios. Internet of Things. Coordinate the coordinated development of the mobile Internet and the narrowband Internet of Things (NB-IoT), and improve the provincial network that supports narrowband Internet of Things. Accelerate the large-scale deployment of IoT terminals and sensors in key areas such as transportation, logistics, and municipal administration, and promote unified access, centralized management, and sharing and utilization of sensing devices.

Industrial Internet. Accelerate the construction and promotion and application of secondary and tertiary industrial Internet identification resolution in Zhengzhou, Luoyang, Xinxiang, Xuchang,



etc., build a "1+N+N" (1 comprehensive platform, N subdivided industry and specific field platforms, N industrial cluster platforms) industrial Internet platform system, support Zhengzhou to build a national industrial Internet platform application innovation and promotion center, promote the construction of a national industrial Internet big data sub-center, and strive to create a national industrial Internet demonstration zone.

**Fixed network.** Promote the upgrade of "all-optical network Henan", continue to expand the coverage of gigabit optical network, and achieve full coverage of gigabit broadband for urban households and 6 gigabit fiber network for rural households. Implement the Zhengzhou direct connection point upgrading project, improve Internet international export bandwidth capacity and intercity export bandwidth capacity, promote the construction of basic telecom operators' backbone network nodes and centers, and make every effort to build a national important information and communication hub and information distribution center. Accelerate the large-scale deployment of the next-generation Internet on Internet Protocol version 6 (IPv6) and increase the proportion of IPv6 active users and traffic. Strive to build a national new Internet exchange center.

**Computing power facilities.** Promote the construction and development of the National Supercomputing Center Zhengzhou Center and the Zhongyuan Artificial Intelligence Computing Center, continuously improve operational efficiency, accelerate the construction of sustainable innovative application ecosystems in key areas, and provide strong computing power support for economic and social development. Promote cross-border integration of emerging technologies. Improve the comprehensive application level of big data. Accelerate the construction of the national big data comprehensive pilot zone, actively develop hardware, software, terminal, content and service industries related to big data, and build a sound big data industry ecosystem. Accelerate the construction of provincial big data centers, build a national (Zhengzhou) data hub port, promote the aggregation, exchange, sharing and opening of government affairs data resources, and support the construction of various big data public service platforms and big data industry (transaction) centers. Promote the innovative application of big data in industry, agriculture, telecommunications, finance, environmental protection, social governance, public security and other fields, and fully realize the potential of industrial development.

**Strengthen the innovative application of artificial intelligence.** Strengthen basic theoretical research and key common technology research in the field of artificial intelligence, focus on breakthroughs in core application technologies such as image recognition perception, digital image processing, speech recognition, intelligent judgment and decision-making, introduce a number of leading artificial intelligence enterprises, accelerate the cultivation and expansion of local enterprises, and strengthen intelligent products such as intelligent networked cars, intelligent robots, intelligent drones, intelligent computing equipment, and smart home products. Deepen the innovative application of artificial intelligence technology in intelligent manufacturing, modern agriculture, smart city, smart cultural tourism, smart medical and other fields, and create a national new generation of artificial intelligence innovation and development pilot zone. Accelerate the application of blockchain scenarios. Support the construction of various blockchain technology innovation platforms such as blockchain public service platforms, computing power public service systems and alliance chain underlying platforms, promote the demonstration of the integration and innovative application of blockchain in various economic and social fields, create typical application scenarios of blockchain, and accelerate the deep integration and development of

blockchain and the real economy. Support the construction of digital asset trading platform encourage localities with the capacity to explore and carry out blockchain-based digital as right confirmation trading business, and build digital asset blockchain trading platforms. Strengthen information security. Vigorously develop the network security industry. Support Zhengzhou to build a provincial information security industry demonstration base, establish national network security industrial park, break through key technologies such as mimic def trusted computing, and zero trust, and focus on strengthening the research and development information security products and services in emerging fields such as cloud computing, indu Internet, Internet of Things, and Internet of Vehicles. Accelerate the substitution of local products for critical information infrastructure, promote the deployment and application of advanced applicable products and services in important fields such as government affairs, communications, finance, and transportation, and build a national first-class network security technology innovation center and network security equipment manufacturing base. Improve the of information security supervision services. Strengthen the establishment of service platform in areas such as security protection, security training, security operations, and security information, improve network public security service capabilities, establish security assurance systems adapted to new infrastructure, complete network data security monitoring mechanisms improve capabilities such as early warning of data leaks and monitoring of important sensitive data, and protect network data security and users' personal privacy.

专栏 1：新一代信息技术产业重大项目
第五代移动通信：建设中国移动 5G 联合创新中心（河南）开放实验室、中国联通（河南）5G 重点实验室、中国电信信创应用适配基地、中国广电（河南）5G 联合创新中心、中国铁塔（河南）5G 技术创新中心、华为垂天 5G 边缘计算实验室、中兴 5G 微基站和智慧杆塔集成、许昌 5G 创新应用产业园、鹤壁 5G 产业园等 16 个重大项目，巩固我省 5G 网络枢纽地位。
工业互联网：建设宇通商用车智联平台、智能传感器工业互联网平台、全断面隧道掘进装备行业工业互联网平台、煤矿智能开采工业互联网平台、钢铁行业工业互联网平台、中国耐火材料工业互联网平台等 21 个重点行业工业互联网平台，打造中西部地区工业互联网创新发展高地。
集成电路：建设郑州锐杰微 SIP 芯片封装、郑州信大捷安光接口网络安全芯片研发及产业化、鹤壁仕佳光子阵列波导光栅（AWG）及半导体激光器芯片产业化、三门峡中科锐光功率器件封装、河南东微半导体靶材、多氟多超净高纯电子级氢氟酸等 19 个重点项目。
新型显示和智能终端：建设鹤壁精密电子产业基地、郑州华锐光电第五代薄膜晶体管液晶显示器件等 55 个重点项目，形成 1000 万台个人计算机（PC）终端和服务器生产能力。
高端软件：建设郑州鲲鹏软件小镇、云湖智慧城、紫荆网络信息安全科技园、新乡鲲鹏软件园、南阳中关村信息谷软件创业基地和郑州网络空间城市安全竞争靶场、国家级信息安全检测中心、郑州信安通信 5G 网络安全试验场等重大项目。
智能传感器：建设新乡新东微电子 6 英寸 MEMS 工艺生产线、郑州汉威科技 MEMS 传感器封测基地等重点项目。
先进计算：建设鲲鹏硬件生产基地、浪潮安全可靠生产基地、中国长城（郑州）自主创新基地、紫光智慧计算机终端全球总部基地等重点项目。
大数据：建设中国联通中原数据基地三期、中国移动（河南）数据中心二期、中国移动（河南郑州）数据中心一期、中国电信郑州航空港数据中心一期、中国移动（河南洛阳）数据中心二期、中原大数据中心、省大数据中心、国家（郑州）数据枢纽港、上汽集团云计算（郑州）数据中心、濮阳医学大数据与人工智能产业园、牧原集团数据湖云计算中心等 22 个重大项目，数据中心机架数量达到 15 万架，打造全国一流大数据产业中心。
人工智能：建设郑州海康威视中原区域总部、新乡新松机器人产业园、中原昇腾人工智能生态创新中心、鹤壁人工智能产业园等 14 个重大项目，打造海康威视郑州科技园、科大讯飞中原业务中心、寒武纪人工智能等创新创业基地，建设一批“AI 赋能场”。

(2) Biotechnology industry. Seize the industrial development opportunities brought about by accelerated evolution of biotechnology and the rapid growth of life and health demand, strengthen basic and applied research in the bioindustry, focus on breakthroughs in key common technologies, improve the level of industrial development, guide the high-quality development of biomedicine

biomedical engineering, bioagriculture, biomanufacturing and biosecurity, and better meet the needs of people's better life.

Improve the basic innovation ability of biomedicine. Focusing on malignant tumors, major infectious diseases, immune system diseases, cardiovascular and cerebrovascular diseases, neuropsychiatric diseases, chronic diseases and other fields, accelerate the integration of biotechnology, artificial intelligence, big data and other emerging technologies, focus on breakthroughs in gene editing, green manufacturing of APIs, pediatric preparations, new vaccines and new antibody drug preparations, improve drug design and research and development capabilities, accelerate the construction of key common technology platforms such as lead compound screening, drug analysis and testing, preclinical efficacy and safety evaluation, promote innovative drugs, Accelerate the research and development and industrialization of end generic drugs, modern traditional Chinese medicines, biotechnology drugs, etc. Further promote the consistency evaluation of the quality and efficacy of generic drugs, and promote alternative use of generic drugs. Promote the upgrading of the quality of large varieties of traditional Chinese medicines, improve the standardization level of traditional Chinese medicinal materials, accelerate the development of granules and standard extracts of traditional Chinese medicine formulas, and promote the upgrading of biotechnology and process optimization of biotechnological drugs. Focus on Henan local medicinal materials resources such as *Artemisia annua*, oregano, and danshen, further increase innovation and research and development, and on building a production base for medicinal materials in Funiushan production area, Dabie Mountain production area, Taihang Mountain production area, Huai Yao production area and Huai-Hai Plain production area.

Promote the upgrading of the biomedical engineering industry. Encourage localities with industrial bases to gather and develop high-end medical consumables such as high-performance anesthesia products, new indwelling needles, electrostatic wire neural catheters, and medical films, develop high-value consumables industries such as blood purification materials, medical biodegradable polymer materials, and artificial joints, and support Xinxiang, Anyang, Pingdingshan, etc. to build emergency reserve bases for medical materials and medical hygiene production bases. Develop a series of technologies and products such as in vitro diagnostic reagents, supporting instruments and key raw materials such as immunodiagnostic products and microbial detection. Accelerate the development of clinical precision molecular detection systems, medical non-invasive ventilators, new intelligent rehabilitation equipment and other products. Develop wearable devices, high-end ultrasound imaging equipment, 5G Internet medical devices, medical robots and other intelligent medical devices. Organize and carry out the work of third-party cooperation between advantageous enterprises and medical institutions and medical institutions.

Support the breakthrough development of biological agriculture. Accelerate the construction of national biological breeding industry innovation center, actively promote the construction of Shennong seed industry laboratory, strive to create a national laboratory for seed industry, optimize and improve the breeding technology system of major crops, focus on breakthroughs in common technologies of breeding such as engineered haploids varieties, high-throughput genotyping, gene editing, and cell mutagenesis, and create new varieties and germplasms of animals and plants with independent intellectual property rights. Improve the biological breeding

safety tracking and product traceability system, build a group of biological breeding research institutions with international leading research and development level, and create a number of modern biological seed enterprises (groups) with international competitiveness. Support the protection and utilization of agricultural germplasm resources, breeding innovation, variety testing and the construction of breeding bases, cultivate and promote breakthrough new varieties and enhance the core competitiveness of seed enterprises. Support the development of major products such as biopesticides, biological veterinary drugs, and new animal vaccines in Luoyang, Anyang, Shangqiu, Hebi and other places, develop biological veterinary drugs and biological additives that can replace antibiotics, and promote industrialized large-scale production and application.

Accelerate the expansion of the biomanufacturing industry. Improve the innovation and development capacity of the biomanufacturing industry, focus on the development of bio-based materials and bio-based chemicals, carry out research and development of key technologies in the utilization of raw materials, the creation of biological tools, and the biological processing process, build a core strain and key enzyme creation technology system for biomanufacturing, promote the large-scale production and application of bio-based materials, bio-based chemicals, and new fermentation products, enhance the economy and market competitiveness of bio-based products, promote green biotechnology in chemical, pharmaceutical, textile, food, and other industries, carry out demonstrations in pollution control and other industries to promote green, circular and sustainable development of biological manufacturing. Cultivate and expand biomanufacturing industrial clusters such as Xinxiang, Xuchang, Zhoukou and Puyang, support the construction of biomanufacturing industrial parks, improve the independent innovation ability of amino acids, lactic acid, vitamins and other bulk fermentation products, and realize benign and high-end industrial development.

Strengthen biosecurity. Support forward-looking and basic research on major infectious diseases in advance in places where conditions permit, promote industry-leading enterprises, research institutes and universities in the province to accelerate the construction of P3 laboratories and improve the basic support capacity of the biosecurity system. Produce and reserve a batch of drugs for the prevention and treatment of major infectious diseases, improve the production and reserve capacity of biological protective equipment, accelerate the development of high-end emergency medical equipment, negative pressure ambulances and intensive intensive care units (ICUs) necessary for testing and rescue equipment, and improve emergency response capabilities for public health emergencies.

专栏 2：生物技术产业重大项目
生物医药：建设真实生物口服固体制剂、太龙制药年产中药液体制剂、嵩县中药材产业扶贫基地药材和中药饮片加工、泰丰制药高端原料药、羚锐制药中药智能提取、新乡华兰基因单克隆抗体药物开发及产业化、鸿运华宁创新抗体药大规模生产基地、美荷肿瘤转化医学成果产业化基地等 87 个重点项目，加快生物医药产业关键共性技术创新与转化平台建设，推进安阳、许昌、洛阳、新乡、漯河、南阳、驻马店、郑州临空生物医药等产业园建设，打造全国重要的现代生物和生命健康产业基地。
生物农业和生物制造：建设国家生物育种产业创新中心、神农种业实验室、金丹乳酸高纯度 L-乳酸、新拓洋生物化工产业园、义马煤业集团生物蛋白纤维及其衍生物、联邦制药阿莫西林制剂和青霉素制剂等兽药生产等 49 个重点项目，推进濮阳生物降解材料产业集群、洛阳现代生物产业化基地、邓州金碧生物基合成材料产业园等建设，形成千亿级生物育种产业集群，聚乳酸生物基材料生产技术达到世界先进水平。
医疗器械与装备：建设驼人医疗器械产业新城、河南亚都实业防护物资储备、河南汇博神方智能康复机器人、安图生物诊断仪器产业园、河南翔宇康复设备产业园等 19 个重点项目，提升康复器械、智能显微镜等新医疗器械产品开发能力，打造国内最大的体外诊断产品生产基地和全国重要的医用物资应急储备基地。

(3) New material industry. In line with the development trend of high-performance, multi-functional and greening of new materials, vigorously develop electronic functional materials, high-performance chemical materials, advanced metal materials, and inorganic non-metallic new materials, strengthen the overall planning and connection of basic research, applied technology research and industrialization of new materials, concentrate on breaking through a number of key common technologies in key application fields, accelerate the transformation of new material innovation achievements and industrialization demonstration applications, strive to promote development of the industrial chain to the middle and high-end, and build a new material industrial base with important national competitiveness and influence.

Accelerate the development of new functional materials. Focusing on the development needs of energy, integrated circuits, new displays, electronic components, etc., focus on the development of key materials such as electronic grade polysilicon, electronic grade glass fiber, electronic grade chemicals, high-end cover glass, new 3D display, etc., improve the localization and localization of foreign monopoly materials, and create a 10-billion-level electronic material industry. Relying on Zhengzhou High-tech Zone, Zhecheng County, Fangcheng County, Changge County, etc., plan to build a superhard material characteristic park, vigorously develop high-end superhard materials and products such as polycrystalline diamond composite sheets, precision efficient abrasives, etc., and build the world's largest superhard material R & D and production base.

Cultivate and expand high-performance chemical materials. Accelerate the development of nylon material industry, reasonably expand the production scale of upstream raw materials such as adipic acid, caprolactam, nylon 66 polymer on the basis of comprehensive demonstration of resource and environmental carrying capacity, expand and strengthen the weaving industry such as nylon industrial yarn and composite nylon fabric, and promote the development of engineering plastics industry such as nylon modified injection molding and nylon film to deep processing. Accelerate the development of new chemical materials and fine chemicals such as carbon-based materials, fluorinated polymers, modified polyoxymethylene, green fibers, new rubber additives and ion exchange materials, and cultivate characteristic fine chemical industry clusters.

Accelerate the construction of Puyang Polycarbon New Material Science and Technology Park, promote the integration of polycarbon-grade bisphenol A, 4,5 tons of special polycarbonate and other projects, expand the production scale of special polycarbonate, couple high-end

manufacturing industries such as auto parts and optical lenses, and build an important national polycarbon and other polymer production and research and development base.

Vigorously develop advanced metal materials. Focusing on the development needs of aerospace energy vehicles, rail transit, energy conservation and environmental protection, promote the construction of metal material bases such as Zhengzhou aluminum alloy, Hebi magnesium alloy Anyang Iron and Steel, Luoyang tungsten molybdenum titanium and so on, guide enterprises to develop special alloy steel for high-end equipment and steel for core basic parts, accelerate the development of lightweight and specialized alloy materials such as medium and high-end aluminum processing, magnesium alloy, molybdenum tungsten copper and titanium deep processing, actively develop high-performance special materials such as aerospace aluminum alloy and hard tungsten alloy, and extend the deep processing industrial chain. Promote the extension to high-precision and cutting-edge products.

Actively develop inorganic non-metallic new materials. Focusing on the needs of green building energy conservation and environmental protection, high-end equipment, new energy and other fields, we will focus on the development of new inorganic non-metallic materials and products such as special glass, high-performance glass fiber, new refractory materials, advanced ceramic materials, and new carbon materials. Consolidate traditional advantages such as high-performance refractories, strengthen production technology research and development and high-end product manufacturing, and build a global refractory industry base. Vigorously develop special high performance ceramic materials, break through key common technologies such as powder preparation, advanced molding and sintering of high-activity and high-purity functional ceramic raw materials and improve material yield and performance stability. Accelerate the research and development of new products such as ultra-high-power graphite electrodes and new abrasive materials, and promote breakthroughs in carbon nanomaterial production technology.

专栏 3：新材料产业重大项目
电子功能材料：建设中硅高科硅基电子信息材料转型升级、襄城锂电池负极材料、平煤神马硅烷科技高纯硅烷和半导体硅材料等 50 个重点项目，打造千亿级电子材料产业集群。
先进金属材料：建设明泰铝业铝合金新材料创新制造中心、洛新钨钼产业基地、海尔轻量化产业园、宝武铝深加工、焦作钛合金深加工、宝武金属产业园、安钢冷轧电磁新材料等 50 个重点项目，打造全国重要的先进金属材料产业基地。
高性能化工材料：建设平煤神马聚碳材料、神马艾迪安己二胺、尼龙科技己内酰胺技改、平顶山三梭尼龙 6 切片、平顶山工程塑料尼龙 66 切片、银金达可降解聚酯新材料、中原绿色涂料产业园、佰利联氯化法钛白粉、新乡化纤高品质超细旦氨纶纤维、汝州市高性能改性塑料、河南神马催化科技催化剂制备与再生、河南能源集团商丘碳纤维及复合材料、永城市瑞柏醋酸衍生物等 100 个重点项目，推进中维特神尼龙产业园、濮阳聚碳新材料科技产业园、济源纳米材料产业园等产业园建设，打造具有国际影响力的尼龙新材料产业集群和国内一流化工新材料基地。
无机非金属新材料：建设泛锐熠辉碳纤维增强陶瓷基复合材料、新乡烯力石墨烯散热膜及复合铜新材料、河南黄河旋风超大腔体智能化锻造压机合成钻石产业化等 50 个重点项目，推进巩义特耐专业园区、新密特耐专业园区、许昌新材料产业园、中钢洛耐先进耐火材料产业园、平顶山碳基新材料循环经济示范园等建设。

(4) Energy conservation and environmental protection industry. Accelerate the integration of energy conservation and environmental protection industry with information technology and advanced manufacturing technology, promote energy conservation and environmental protection technology innovation to break through bottlenecks, accelerate the digitalization, networked intelligent transformation and upgrading of energy conservation and environmental protection

technology and equipment, vigorously develop energy conservation and environmental protection service industry, promote the deepening development of "smart environmental protection", build energy conservation and environmental protection industrial chain with coupling between industries, upstream and downstream connection, and advanced technology, and build an international energy conservation and environmental protection industrial base.

Improve the competitiveness of high-efficiency and energy-saving equipment. Focusing on industrial energy saving, building energy conservation and low-carbon transportation, strengthen the research and development and application of high-efficiency and energy-saving technology equipment and products, and promote the research and development of green steel technology which hydrogen replaces carbon as a reducing agent and energy carrier in the steel industry. Accelerate the research and development of complete sets of equipment products and key components such as high-efficiency energy-saving and environmental protection boilers, large-scale high efficiency disc filters, high-efficiency and energy-saving motors, waste heat and pressure generation utilization equipment and high-efficiency composite cooling (condensing) equipment and promote the development and industrialization of green consumer products such as energy saving home appliances and energy-saving lighting. Accelerate the digitalization and intelligent development of energy-using equipment in key energy-using units, and improve the level of comprehensive energy efficiency. Promote the coordinated development of intelligent construction and building industrialization, and vigorously develop complete sets of equipment and products for steel structure buildings and prefabricated building automation.

Promote the quality and efficiency of advanced environmental protection equipment and materials. Accelerate the development of special equipment and materials such as high-concentration wastewater treatment equipment and water treatment agents, and promote the development of decentralized mobile low-energy consumption and remote operation and maintenance technical equipment suitable for rural domestic sewage treatment. Support the research and development and application of carbon capture, utilization and storage technologies, accelerate the development of air pollution control equipment such as desulfurization, denitrification and volatile organic compounds (VOCs), and promote the research and development of coal alternative technologies equipment. Improve and develop solid waste utilization and disposal equipment such as garbage compression, large-scale slag and steel slag vertical milling and intelligent sorting, and actively develop technical equipment for hazardous waste treatment and utilization and decentralized and miniaturized technical equipment suitable for rural domestic sewage and domestic waste treatment and disposal. Encourage large-scale and continuous production of degradable materials, and improve the scale and level of alternative products for various degradable plastics.

Strengthen the technology and equipment for resource recycling. Focus on the utilization and disposal of industrial solid waste, the overall dismantling of scrapped vehicles (electronic waste), thermal cracking of organic solid waste and other fields, accelerate the development of high-efficiency comprehensive utilization technology and equipment, and promote the recycling and comprehensive utilization of urban mineral development, industrial solid waste, new energy waste, construction waste, kitchen waste, and agricultural and forestry waste. Standardize the order of the remanufacturing market, and promote the research and development of key remanufacturing processes and technologies such as construction machinery, agricultural machinery

and high-end mechanical and electrical products. Improve the green procurement system, coordinate the implementation of green product labeling and certification, and promote the reduction, harmlessness and recycling of packaging materials.

Vigorously develop energy conservation and environmental protection service industries. Improve the "leader" system for energy efficiency and water efficiency of products in key industries to further promote market-oriented energy conservation and environmental protection mechanisms such as cleaner production audits, contract energy management, and energy use right trading. Expand the third-party governance of environmental pollution in the park and the ecological environment-oriented development model, etc., and create a full-chain energy-saving environmental service system. Improve the environmental protection service information platform, and promote the application of satellites, the Internet, and the Internet of Things in environmental monitoring. Strengthen the construction of waste information platform, promote the new model of "Interr recycling", establish an industrial system for recycling metals, waste lead batteries, power batteries, etc., and build an important domestic waste resource recycling base.

专栏 4：节能环保产业重大项目
<p>高效节能：建设中原节能环保产业园、郑州高效洁净锅炉研发及智能制造产业基地、河南省四通锅炉全球共享锅炉制造产业园、许昌市建安区节能环保装备和服务产业园等 50 个重点项目，打造洛阳、许昌高效节能装备产业集群。</p> <p>先进环保：建设河南省奥瑞环保设备生产基地、河南宇璞环保脱硫脱硝技术装备、上海山美高效智能环保装备生产线、天能集团（濮阳）循环经济产业园再生铅升级改造等 50 个重点项目，加快建设周口生物降解材料产业基地，建成全国重要的节能环保装备基地。</p> <p>资源循环利用：建设东方雨虹郑州研发生产中心、洛阳工业资源综合利用基地、河南金利金铅集团铅基多金属固废协同强化冶炼产业化示范及锌资源综合利用、大宗工业固体废物资源化工程项目示范基地、平顶山工业静脉产业园等 50 个重点项目，打造一批资源综合利用产业基地。</p>

Third, strengthen innovation breakthroughs and integrated applications, and cultivate and expand high-growth industries

Strengthen the breakthrough application of key technologies and equipment and the integration and empowerment of digital technologies, promote the accelerated penetration of emerging technologies into high-end equipment, new energy, new energy and intelligent networked vehicles, aerospace and emerging service industries, continue to improve industrial energy levels and comprehensive advantages, and cultivate new formats and models with stronger innovation and higher added value.

(1) High-end equipment industry. With independent security and controllability as the core, in-depth application of new technologies such as mobile Internet, big data, cloud computing, and the Internet of Things, support the development and application of the first (set) major technical equipment, promote the high-end development of intelligent manufacturing equipment, improve the development level of high-end engineering equipment, promote the coordinated development of the whole industrial chain of agricultural equipment, enhance the core competitiveness of advantageous high-end equipment, and build a well-known high-end equipment manufacturing base in the central and western regions.

Promote the high-end development and application of intelligent manufacturing equipment. Concentrate on breaking through a number of key common technologies of intelligent complete sets of equipment, such as intelligent CNC systems, high-precision new sensors, key functional components, and networked system integration, and enhance the supply guarantee capabilities of intelligent robots, high-end CNC machine tools and new additive manufacturing. Promote the



research and development and industrialization of robot ontology technology, control technology, system integration technology, etc., accelerate the development of a new generation of industrial robots, service robots, special robots and industrial drones, and build a new generation of intelligent robot innovation ecology and development system. Accelerate breakthroughs in key common technologies of high-end CNC machine tools such as digital design technology and high-precision machining and forming technology, expand the scale of high-end general machine tools and promote the development of high-end CNC machine tools in the direction of high speed, compounding, precision and multi-axis. Expand the scale of industrial-grade additive manufacturing equipment industry, build an intelligent R&D platform for additive manufacturing and promote the industrialization application of additive manufacturing technology in aerospace, new energy and intelligent networked vehicles, medical devices, personalized manufacturing and other fields. Carry out key technology research in the fields of rail transit vehicles, vehicle control, signaling, safety, vehicle-road coordination, power supply and distribution, testing and maintenance, promote the localization of high-quality parts such as transmission parts, brake discs, traction motors, etc., and promote the research and development and industrialization of station equipment such as rail transit ticket inspection, safety testing, and screen doors. Enhance the competitiveness of high-end equipment. To adapt to the development trend of intelligent, high-end and lightweight engineering equipment, vigorously develop large-tonnage loaders, new shield machines, large-scale pavement construction machinery, intelligent dome comprehensive mining equipment for coal mines, large-scale intelligent cranes, high-pressure large-flow hydraulic parts, high-performance components and high-end bearings, large-scale explosion-proof motors and other complete machines and key components, etc., to improve independent supporting capabilities. Vigorously develop construction machinery remanufacturing, accelerate the process of manufacturing service-oriented and service-oriented manufacturing, build a world-class high-end engineering equipment industrial cluster. Promote the intelligent and low-carbon development of complete sets of equipment for large-scale mines. Carry out research on key technologies such as flexible DC transmission converter valves, controllable arresters, DC energy consumption devices, hybrid DC control protection, environmentally friendly switches, high-precision sensing, primary and secondary fusion, intelligent inspection, energy storage converters, etc., accelerate the research and development of green, efficient, intelligent transmission, transformation, distribution and new energy power equipment, promote the application of new materials and technologies in power equipment, and improve the localization level of core components.

Promote the development of the whole industrial chain of agricultural equipment. Promote the digitalization of agricultural production systems, accelerate the deep integration of agricultural machinery and equipment with information technologies such as the Internet, big data, intelligent control, and satellite positioning, build a unified industrial Internet platform for big data management of intelligent agricultural equipment in the province, and improve the intelligent level of agricultural equipment. Support the construction of a national agricultural machinery equipment innovation center, accelerate the development of high-end agricultural equipment and key core components such as large and efficient tractors and the compound work tools, large and efficient combine harvesters, high-efficiency special agricultural machinery and agricultural drones, agricultural and forestry ecological plant protection

equipment, and build a modern agricultural machinery and equipment industrial base with international competitiveness. Focusing on the processing of noodles, meat, oil, milk, fruit vegetables and other products, improve the research and development level of food processing equipment. Strengthen the research and development and promotion of complete sets of equipment technology such as facility horticulture, facility animal husbandry, and facility aquatic products.

专栏 5：高端装备产业重大项目
<p>智能制造：建设瑞博电气年产综合电气设备、洛阳国家农机装备创新中心、中铁装备集团隧道专用设备关键技术研究及产业化应用、河南城盾智能城市地下管廊智能盾构机及配套环保设备、河南龙佰智能化矿山装备和化工装备、河南矿山单梁起重机及电动葫芦智能化技术改造、中联重科开封智能产业园、中铁隧道设备产业园（一期、二期）、卫华集团基于 5G 智能装备及大数据技术的互联网示范平台、南阳大型镀膜装备研发及产业化等 100 个重点项目，推进许继平高智能电气、洛阳智能农机、中信重工机器人、中铁装备智能盾构等产业基地建设，打造全国智能制造先行区。</p> <p>轨道交通装备：建设福斯罗（安阳）高铁配件基地、河南思维信息轨道交通产业园、中国中车郑州轨道交通装备基地配套企业产业园标准化厂房、洛阳中原轨道交通产业园一期等 30 个重点项目，打造全国领先的轨道交通产业装备基地。</p> <p>机器人及数控机床：建设百维智能装备产业园、哈工大机器人（郑州）智能装备科技园、平顶山世邦机器高端装备制造产业园、许昌经开区智能装备产业园等 50 个重点项目，打造国内有重要影响力的机器人产业基地和国内领先的高档数控机床生产基地。</p> <p>关键零部件：建设河南威猛高端智能循环经济处理利用成套装备、洛阳轴研所科技产业基地、洛阳新强联精密轴承智造科技园等 30 个关键零部件重点项目，建成国内先进的关键零部件生产基地。</p>

(2) New energy industry. Seize the opportunity of rapid development of new energy, accelerate high-quality development of the solar energy industry, promote a more complete wind energy equipment industry chain, actively develop biomass energy and geothermal energy, promote the large-scale and industrialized development of various forms of new energy, promote the optimization and adjustment of the province's energy structure, and accelerate the construction of a low-carbon and efficient energy support system.

Promote the solar energy industry to improve quality and efficiency. Vigorously develop advanced crystalline silicon cells, high-efficiency photovoltaic modules and intelligent inverter systems, promote the development of solar energy integrated application technology, and promote the industrialization of new technologies for high-efficiency and low-cost solar energy utilization. Actively promote the integrated development of solar thermal utilization and building, promote the integration of distributed utilization technology and energy storage technology, and realize the collaborative three-dimensional innovation development and transformation and upgrading of upstream manufacturing and downstream application markets.

Promote the agglomeration and development of the wind energy industry. Focus on breakthrough key technologies such as large-scale wind farm operation and maintenance, intelligent control of variable pitch, and big data management of wind farms, and improve the production and manufacturing level of low-wind speed wind turbines. Support the expansion and efficiency of turbine host production bases such as Xuchang, Anyang, Xinyang and Puyang, drive the agglomeration and development of wind power supporting industries such as blades, bearings, brakes and towers, and promote a more complete wind power equipment industry chain. Promote digitalization and intelligent construction of wind farms, accelerate the integration of wind power and energy storage technology, improve the level of consumption and utilization of wind power bases, and improve the stability and sustainability of wind power.

Actively develop biomass and geothermal energy. Actively develop comprehensive utilization devices for biomass resource collection, transportation, molding, gasification, power generation and heat supply, break through advanced biomass energy and chemical technology, cultivate and develop non-grain biomass liquid fuel multi-generation products, and explore and carry out demonstration of cellulosic ethanol and green biorefinery industrialization. Steadily develop biomass gas supply and heating, biological liquid fuel, etc., and cultivate a number of biomass equipment manufacturing, high value-added product development, comprehensive services and characteristic backbone enterprises. Strengthen the large-scale utilization of geothermal energy and promote the large-scale and industrialization of geothermal heating equipment, and promote breakthroughs in the geothermal energy heating industry model.

Realize the diversified and coordinated development of new energy. Actively layout emerging energy industries, accelerate research on advanced basic processes and key basic materials, carry out research and development of advanced energy storage and energy conversion technologies and equipment, explore commercialization paths such as advanced energy storage and hydrogen energy, accelerate application demonstrations, and build a number of domestic leading R&D, manufacturing and application demonstration bases for new energy industries. Accelerate the development of smart grids, microgrids, distributed energy resources, and new energy storage, build a basic supporting technology system adapted to the energy Internet, and promote the construction of "Internet +" smart energy.

专栏 6：新能源产业重大项目
风能：建设濮阳先进风机制造基地及风电工程应用中心、风电数字化服务中心、风电培训中心、信阳明阳中部总部等 47 个重点项目，打造风电整机及零部件新兴产业集群。
太阳能：建设河南安彩太阳能光热玻璃、河南平煤隆基高效单晶硅电池片、平煤隆基太阳能电池二期升级改造、许昌安彩光伏轻质基板、睢阳区中国建材光电玻璃生产线（二期）等 12 个重点项目。
地热能：建设河南省地热能供暖监测平台等重点项目。
生物质能：建设中电建兰考生物天然气示范、河南天冠集团纤维乙醇生产技术优化等 9 个重点项目，推动生物质能示范应用。

(3) New energy and intelligent networked vehicle industry. In line with the trend of electrification, networking and intelligence of the automotive industry, strengthen technological innovation and demonstration applications, comprehensively promote the development of new energy and intelligent networked vehicle industry, cultivate new forms of integrated development of automobiles, energy, transportation, etc., and build an important national new energy and intelligent networked vehicle industry base.

Promote the high-quality development of new energy vehicles. Strengthen the innovation of vehicle integration technology, optimize the development process of new energy vehicles, break through key technologies such as vehicle design, new energy powertrain, new energy vehicle thermal management system, vehicle matching, etc., focus on the development of full-function, high-performance vehicle control systems and lightweight material bodies and key components, and launch a number of new models with market competitiveness. Carry out in-depth basic research on power batteries, break through the development of key battery materials such as solid electrolytes, multi-component light metal cathodes, nano-silicon anodes, and graphene anodes, focus on the development of new batteries such as all-solid-state lithium batteries and lithium-sulfur batteries. Accelerate the construction of charging infrastructure, appropriately lay

power exchange facilities according to local conditions, develop new charging technologies as intelligent and orderly charging, high-power charging, and wireless charging, and promote interconnection of "vehicle-pile-cloud-network". Accelerate the R&D layout of hydrogen fuel commercial vehicles, and carry out the research and development and industrialization of hydrogen fuel vehicle power system integration, vehicle system power matching, hydrogen fuel cells, Accelerate the construction of fuel cell vehicle demonstration and application city cluster lay out hydrogen energy infrastructure that is compatible with the needs of hydrogen fuel cell vehicles.

Accelerate the development of intelligent vehicle systems. Support cross-border collaboration between enterprises, carry out joint innovation such as intelligent driving computing platform autonomous driving cloud service, and intelligent network system software, and create intelligent network connection and intelligent driving system solutions. Promote the research and development of intelligent networked vehicle models of vehicle enterprises, integrate and apply functions such as intelligent interaction, automatic cruise, and vehicle-road coordination, and develop L4 new vehicles; Support relevant supporting enterprises to develop automotive-grade chip sensors, intelligent voice systems and intelligent cockpits and other products and technologies required for intelligent driving. Encourage localities with the capacity to take the lead in carrying out pilot projects for the comprehensive application of intelligent vehicles, carry out demonstration applications in scenarios such as mine transportation, travel, logistics and distribution, airports, port (railway) freight yards, parking, and sanitation, and explore commercial development model of intelligent vehicles. Promote the digital transformation and upgrading of road infrastructure such as traffic signs and signals, and build a new intelligent traffic management and control system.

Cultivate new forms of automobile development. Accelerate the application of new energy vehicles in urban public transport, urban distribution, municipal sanitation, municipal engineering and other fields, and encourage the commercial operation of time-sharing leasing, unmanned taxi logistics and distribution services, and intelligent parking with new energy and intelligent networked vehicles as the carrier. Promote the collection, use, and privacy protection of vehicle data, and support data-driven business model innovation. Promote commercial innovation on vehicle interaction, cultivate and develop commercial services such as personalized customization of travel and smart home interconnection, and explore and create new travel formats.

专栏 7：新能源及智能网联汽车产业重大项目
<p>整车制造：推进上汽郑州基地二期 30 万辆新能源汽车、比亚迪 40 万辆乘用车基地建设，建设郑州宇通客车节能与新能源客车生产基地冲压车间、河南福田智蓝新能源商用车、安阳德力新能源商用车等 10 个重点项目，打造 200 万辆整车产业集群。</p> <p>关键零部件：建设郑州机动车质量检测认证技术研究中心、郑州宇通客车面向产业化的智能客车测试平台研发及生产制造水平提升、鹤壁航盛智能网联 T-BOX 产品自动化生产线、郑州比克电池锂离子电池、中航锂电磷酸铁锂电池生产线技改扩能、科隆能源电池正极材料、河南锂动电源动力电池、河南力旋科技锂电动力电池生产线、豫新新能源汽车整车热管理系统、多氟多新能源动力锂离子电池组、佰利新能源锂电池材料、新能源汽车关键零部件产业园（天海三期）等 150 个重点项目，推进河南中轴高端汽车零部件及智能制造产业园、三门峡中乌合作电动汽车零部件配套产业园等建设，打造国内重要的新能源汽车关键零部件生产基地。</p>

(4) Aerospace industry. Give full play to the existing industrial foundation and regional characteristics, vigorously develop aerospace industries such as aerospace industry, Beidou application, aviation manufacturing and maintenance, and build an important domestic aerospace industry cluster.

Improve the supporting capacity of the aerospace industry. Expand high-end series of pump and valve products, aerospace-grade pipeline fittings, high-end aerospace engine pipeline systems and other high-end hydraulic and pneumatic industry fields. Realize the batch application of aerospace characteristic connectors and other aerospace products and the application of micro small connectors and cable network products in equipment, and carry out connector unit manufacturing capacity building. Strengthen technical research on the application of new materials for high-end fasteners, and ensure key tasks such as new launch vehicles, Beidou, "Chang'e" and "Tiangong" in the aerospace field.

Build the whole industry chain of Beidou navigation. Integrate the important innovation and production factors of Beidou industry, and build a full-factor Beidou industrial chain of hardware products, application terminals, application systems and operation services. Integrate and improve the Beidou foundation enhancement system in the region, achieve consistent benchmark system standards, and provide meter-level, decimeter-level, centimeter-level and post-processing millimeter-level enhanced positioning services in real time. Build a Beidou satellite navigation testing and certification system, and form a standard system for the integration and application of Beidou industry. Implement 7 high-quality solutions for application scenarios in 100 key industries and fields involving national security, social and public safety, national economic people's livelihood, and mass consumption. Build application demonstration projects such as "Beidou + High Score" spatial information for ecological protection in the Yellow River Basin and form a number of independent innovation, advanced technology Beidou products and new functions based on Beidou spatial-temporal information services. Promote the upgrading of the third-generation technology of Beidou of Henan Province's satellite navigation and positioning reference service system, and build the Henan Geographic Information Industrial Park and the Spatial Geographic Information and 5G Integration Application Pilot Zone.

Promote the industrialization of high-score remote sensing. Coordinate the construction of various types of remote sensing data resources for military and civilian businesses, smooth data supply chain, improve data coordination capabilities, promote the open sharing of remote sensing data resources, form a full-link service capability of spatial information from raw data to customized information, and build a complete high-resolution remote sensing technology application promotion service system and industrial development system. Strengthen deep integration with government affairs information systems, achieve full coverage at the city, county, and township levels, and form a spatial information service guarantee system that supports high-quality economic and social development.

Cultivate and expand the aviation manufacturing and maintenance industry. Close strategic cooperation with COMAC, and strive for COMAC to take our province as its important strategic base for strategic layout. Improve the supporting energy level of enterprises in the province such as AVIC Optoelectronics and SIA to participate in the ARJ21 regional aircraft and C919 large passenger aircraft projects. Promote the settlement of ARJ passenger-to-cargo and maintenance bases in our province, build the first aviation materials sharing center in our province, and

form a civil aviation industry base with important influence. Build an international aviation maintenance base park and a bonded distribution center for aviation materials. Improve aircraft R&D and manufacturing, aviation simulation technology and flight simulator and crew simulation manufacturing capabilities. Develop the general aviation R&D and manufacturing chain, cultivate 1-2 general aviation complete aircraft manufacturing enterprises with certain domestic influence and competitiveness, cultivate and expand the UAV R&D and manufacturing industrial clusters such as Zhengzhou Shangjie, Anyang Beiguan, Zhoukou Xihua, etc., and promote "5G + UAV" and "Beidou UAV" to walk in the first square in the country.

专栏 8：航空航天产业重大项目
航天工业：建设河南航天气动高端系列泵阀产品、郑州航天电子微小型连接器、中航光电连接器单元制造能力建设、河南航天精工超高温超高强度高比强度高端紧固件等重点项目，打造国内重要的航空工业基地。 北斗导航：建设国家北斗导航与位置服务中心河南分中心、郑州华泰基于北斗应用的工业自动控制系统及装置、遥感大数据共享资源池等重点项目，推进北斗时空信息应用产业园、“高分+自然资源 and 灾害应急”应用示范工程等建设，打造完整的北斗导航研发、生产、应用服务产业链。 航空制造维修：建设新乡航空工业集团机载设备、三和航空自转旋翼机、河南啸鹰航空穆尼飞机、平原航空器材热交换器芯体等重点项目，推进安阳无人机产业园、周口西华无人机产业园、洛阳万安山通航科创小镇等建设，打造成国内重要的航空零部件产品制造基地。

(5) Emerging service industries. Focus on the transformation and upgrading of strategic emerging industries and the upgrading of residents' consumption, vigorously develop emerging service industries such as scientific and technological services, financial technology, creative services, and health care services, improve service efficiency and service quality, empower comprehensive transformation of production and manufacturing, continue to create new demand for production and consumption, and build a new system of emerging service industries with distinctive characteristics, high quality and efficiency, structural optimization and strong competitiveness.

Improve the level of scientific and technological services. Promote the development of new forms of science and technology incubation, vigorously develop scientific and technological services such as scientific and technological consultation and technology transfer and transformation, accelerate the development of online technology markets and online scientific and technological services, and increase the transfer and transformation of major scientific and technological achievements. Encourage the open sharing of inspection and testing resources, build a number of inspection and testing public service platforms, and develop online automated testing services. Cultivate and develop services such as intellectual property training, patent operation, arbitration and review, patent agency and patent early warning, and promote the deep integration of large-scale scientific research and large-scale production. Introduce and cultivate various types of science and technology service enterprises, and accelerate the innovation of service models and business models.

Strengthen the application of financial technology. Accelerate the wide application of financial technology in the fields of transaction settlement and product innovation, strengthen the integration and innovation of big data, cloud computing, artificial intelligence, blockchain and other fields in the financial field, promote the digital transformation of finance, and improve the efficiency and effectiveness of the financial industry in serving the real economy. Encourage and guide financial institutions to participate in industry-university-research cooperation

innovation, improve the collaborative innovation mechanism of "government-industry-university research funds", and increase financial support for enterprise innovation activities. Accelerate the construction of financial science and technology disciplines, and promote the cross-integration of industrial design, industrial economics, finance, accounting and other disciplines.

Elevate creative services. Promote in-depth cooperation between industrial enterprises and industrial design, clothing design, cultural artwork creative design and other enterprises, vigorously develop professional design and related customization and processing services, create a number of intelligent design cloud platforms, and build a multi-field and all-round new design system. Strengthen the experience of technology-based cultural tourism products, increase the development of original intellectual property rights and research on technology application and accelerate the creation of a high-tech video creative content ecosystem. Improve the digital and intelligent level of cultural and sports venues, and promote the development of smart venues and facilities. Accelerate the digitalization of cultural and creative resources, and promote the integration of Central Plains culture and Yellow River historical and cultural elements and into content creation, production, and innovative design. Vigorously promote the in-depth application of new technologies such as 5G, AI, big data, and AR/VR, introduce and develop formats such as e-sports, live broadcasting, and short video, build a number of digital creative carriers based on high standards such as business district and service industry professional parks, cultivate a number of digital creative enterprises and high-quality IP with core competitiveness, and build a highland of digital creative industries in the central and western regions. Relying on the rich cultural and creative resources of the Zhengzhou metropolitan area, build a national cultural innovation highland, and support the construction of a number of cultural and creative node cities and cultural tourism cultural and creative towns (cities).

Promote the upgrading of health care services. Promote the deep integration of emerging technologies such as 5G and artificial intelligence with different institutions, services, and stages of the healthcare industry, and accelerate the digital transformation of health care services. Build a smart medical service platform in Henan Province, improve the efficiency of medical and nursing care service resources, promote the transformation of telemedicine applications, and improve the transformation efficiency of smart medical technology. Promote the in-depth application of smart elderly care, smart medical care, smart health travel, smart education and health management, and provide intelligent health care services for urban and rural residents. Innovate sports and health services to promote the development of smart sports. Relying on the advantages of landscape, traditional Chinese medicine, Shaolin, Taiji culture and other advantages, promote the organic integration of cultural tourism, health and rural revitalization, build qualified villages into leisure and health resort units, and create an important health destination and health care industry cluster in China. Develop high-quality community health care services, encourage the development of various forms of health care services such as day care, full care, and semi-care, explore extended health care services such as remote inspections, and greatly improve the ability of standardized and personalized rehabilitation services.



专栏 9：新兴服务业重大项目
生产性服务业：建设郑州机动车质量检测认证技术研究中心、中原银行创新研发中心、风神轮胎全球轮胎研发中心、国家检验检测认证公共服务平台示范区基地、国家智能清洁能源汽车质量监督检验中心等 30 个重点项目，推进河南理工大学科技园、中国电建集团华中电力设计研究院科技研发基地、中国检验检疫科学研究院中原研究院产研基地等建设，打造国内重要的生产性服务业基地。
创新创业服务：建设中原数字产业园、河南传媒文化产业园、河南省建筑院总部基地、郑州国际文化创意产业园、国家动漫产业发展基地（河南基地）等 30 个重点项目，打造国内重要跨界融合的产业集群和产业联盟。
“两业”融合：建设芝麻街 1958 双创园区、郑州嘉晨电器基于 5G 应用的工业车辆高速信息采集及监控系统、郑州森源新能源大数据监控运营平台、河南省轴承创新服务平台、河南心连心农业服务大数据平台等 50 个重点项目，打造全国“两业”融合发展先行区。
康养服务：建设郑州迪安检验中心、民生药业现代化医药物流中心、精准医疗和健康研究院平台等 30 个重点项目，推进中科基因郑州科技产业基地、金城医学集团华中区域总部、河南海熙生物科技产业园建设，打造国内康养服务产业高地。

Fourth, strengthen the tracking of breakthroughs in frontier fields and plan for the lay future industries

Focusing on the three paths of “excellent in cultivation”, “new in education” and “out of nothing”, we plan ahead of the core elements to support the development of future industries plan to lay out future industries such as quantum information, hydrogen energy and energy storage, brain-like intelligence, and future networks, strive to achieve major breakthrough several frontier fields, cultivate and form a group of future industrial chain groups with leadership ability, good economic benefits and core competitiveness, and strive to create a national future industry pilot pilot zone.

(1) Excellent and refined leading industry. Based on quantum science and hydrogen energy and energy storage fields with a certain foundation and the ability to seize opportunities and the lead in layout, strengthen the multi-path exploration, cross-integration and source supply disruptive technologies of cutting-edge technologies, cultivate a number of leading enterprises and innovation platforms with an initial international leading role, and strive to produce a number of original and disruptive achievements and seize the commanding heights of industrial development.

Quantum information. Relying on the University of Information Engineering, promote the construction of major research and testing platforms for quantum communication and quantum computing, actively participate in the formulation of international and domestic standards in the field of quantum information, focus on breakthroughs in key technologies for the preparation of quantum chips, quantum programming, quantum precision measurement, quantum computers and related materials and devices, and establish a quantum network and information security system based on quantum computing and quantum transmission. Prepare to establish the Henan Quantum Information Technology Innovation Center and strive to become a national quantum information technology innovation center. Build an open, shared collaborative innovation platform guided by quantum technology applications and covering multiple elements. Carry out key technology and application research of “classical + quantum” hyper-converged computing system, develop quantum computing that can carry out collaborative computing with the supercomputing system of the National Supercomputing Center Zhengzhou Center, realize collaborative computing applications, provide support for solving strong computing power in transportation, agriculture, meteorology and other fields, and build a leading new high-performance computing platform in China.



Hydrogen energy and new energy storage. Focus on key areas and key links of hydrogen energy build a multi-level and diversified innovation platform, support universities, research institutes and enterprises to accelerate the construction of key laboratories and cutting-edge cross-research platforms, and carry out basic research and cutting-edge technology research hydrogen energy application. Relying on leading enterprises to integrate high-quality innovation resources in the industry, lay out and build innovation platforms such as provincial key laboratories and engineering research centers, strive to create a national-level innovation platform, build an efficient collaborative innovation network, and support the development engineering application of key technologies in the industry. Solidly promote the development large-scale application of hydrogen energy technology, rely on Henan Fuel Cell and Hydrogen Energy Engineering Technology Research Center, etc., focus on low-cost and high-efficiency preparation of hydrogen sources, low-temperature and high-temperature fuel cell stacks, key materials, components and their system integration technical research, accelerate the research and development of proton exchange membrane hydrogen fuel cell stacks and high-pressure storage tanks, low-pressure solid hydrogen storage, low-temperature liquid hydrogen systems and other technical equipment, and explore the construction of efficient and intelligent hydrogen transmission pipeline networks and hydrogen filling (liquid) stations. Carry out low-cost and high-efficiency renewable energy hydrogen production demonstration, high-reliability and high environmental adaptability fuel cell bus development and demonstration, fuel cell commercial vehicle development, long-life and high-reliability fuel cell system development and vehicle application, and promote the application of hydrogen fuel cells in urban buses, van logistics vehicles, port trucks and other commercial vehicles and distributed energy stations. Carry out the research and development and manufacturing of large-scale hydrogen electrolyzers and corresponding supporting facilities. Promote technological breakthroughs and promotion of new positive and negative electrode material formulas, nano-scale safety separators, and new high flame retardant and high-temperature resistant electrolytes. Increase the development and application of safety technologies for the whole chain of hydrogen production, storage, transmission and use. Actively develop safe and effective energy storage technology, adhere to the diversification of energy storage technology, promote energy storage theory and key materials, units, modules, and systems to tackle key board technologies, and accelerate the realization of core technology autonomy. Combined with multiple scenarios such as "source, load", a number of energy storage facilities are laid out, the flexibility of the power system improved, and the transformation of new energy storage from the initial stage of commercialization to large-scale development is realized.

(2) There is a new leading industry of Zhongyu. Combined with the industrial foundation and technological maturity of our province, closely follow the latest cutting-edge technologies disruptive technology development trends at home and abroad, accelerate the release of the industrial potential of brain-like intelligence and future networks, rapidly expand the industrial scale, occupy a certain position in the industrial chain and innovation chain, and highlight Henan elements.

Brain-like intelligence. Promote strategic cooperation between Information Engineering University, Zhengzhou University, Henan Normal University and Fudan University Institute of Brain-like Intelligence Science and Technology, strengthen basic theoretical research such

data intelligence, cross-media perceptual computing, hybrid augmented intelligence, swarm intelligence, autonomous collaborative control and optimal decision-making, and strive to achieve major original breakthroughs in the fields of brain-like artificial intelligence algorithms, intelligent diagnosis and treatment of heavy brain diseases, brain-like intelligent chips, intelligent research and development of new drugs, and promote the sustainable development in-depth application of brain-like intelligence.

Future network. Strengthen the research and development of new principle components such as brain-like chips, superconducting chips, and graphene storage, plan ahead of time to develop sixth generation of mobile communication technology (6G), carbon-based chips, aerospace information, virtual (enhanced) reality and other subdivisions, and establish a future information network technology research and development, manufacturing, demonstration and promotion, application services and other development systems. Deeply participate in the national 6G technology project, strive to break through 6G key technologies, and maintain first-move advantages in chips, test equipment, mobile terminals and other fields. Focus on frontier areas such as encryption algorithms, consensus mechanisms, big security audits, and defense deployments, research and breakthroughs in a number of core technologies underlying blockchain componentized general technologies, and industry-specific technologies such as secure private computing, efficient on-chain and off-chain collaboration, cross-chain interconnection, smart contract audit, and vulnerability detection, establish an industry-oriented blockchain basic technology research and development and testing platform, and build an independent and controllable blockchain application service platform covering major cities in the province.

(3) Industries with potential to be created out of nothing. Closely follow the world's scientific and technological frontiers, grasp the trend of future industrial transformation, advance the deployment and development of life and health, cutting-edge new materials, accelerate the industrialization process of new technologies, and strive to change lanes and seize the large major fields and subdivisions, create new tracks, and lead new transformation.

Life and health. Focus on genetic engineering, protein engineering, precision medicine and biomedical materials, emerging infectious diseases and other subdivisions, strive to break through key technologies such as life information interpretation, biosynthesis, gene editing, targeted delivery, etc., and accelerate the development and application of a number of independent and controllable major achievements and products that fill gaps. Promote the clinical application of cell technology, the construction of cell factories and the industrial application of synthetic biology technology, accelerate the research and development and industrialization of new technologies and products such as recombinant protein drugs, high-performance imaging equipment, and immunotherapy, promote the application demonstration of smart diagnosis and treatment, health management, biosecurity governance and other key areas, and promote the precise, efficient, intelligent and preventive development of the life and health industry. Accelerate the construction of major platforms for applied basic research in the health field, health industry innovation service complexes such as the First Affiliated Hospital of Zhengzhou University and Henan Provincial People's Hospital, and improve the level of clinical research and the ability of clinical application trials of medical technology.

Cutting-edge new materials. Carry out forward-looking research on intelligent biomimetic materials, additive manufacturing materials, quantum information materials, high-entropy alloy

graphene-based new materials, functional diamonds, third-generation semiconductor materials, superconducting composite materials, liquid metals, advanced energy storage materials, etc. accelerate breakthroughs in key technologies such as new intraocular lenses, electronic information materials for display panels and high-performance bio-based fully degradable materials, graphene modified materials and innovative components, achieve large-scale, high and cluster development, and promote the formation of a new generation of technical equipment with a new generation of materials. Build a number of cutting-edge new material pilot verification bases and application demonstration platforms.

专栏 10：未来产业重大项目
量子信息：建设河南科技大学基于 OAM 编码的量子通信技术研究、“经典+量子”超融合计算系统关键技术及应用研究等重点项目。 氢能与储能：建设氢枫能源制氢设备技术研发生产、洛阳东旭氢能电机装备产业园、氢储（新乡）能源储氢设备储氢材料生产制造、中原油田可再生资源制氢、中信重工新能源储变电系统（二期）、宇通长寿命高可靠燃料电池系统开发及整车应用等重点项目，推进新乡氢能产业园、濮阳氢能产业园等建设，实现相关产业规模突破 1000 亿元，示范应用氢燃料电池汽车累计超过 5000 辆、加氢站超过 80 个。 类脑智能：建设多模态网络赋能的数字孪生技术研究与系统研制、脑机交互与混合智能关键技术研究、基于 VICTS 技术的多天线合成系统产业化、脑机交互与混合智能关键技术研究等重点项目。 生命健康：建设干细胞临床转化研究与应用产业化、新一代光学相干断层扫描仪及生物测量仪等重点项目。 未来网络：建设中部地区（河南）商用密码产品检测中心、清洛基地“区块链+工业设计”版权交易平台等重点项目。 前沿新材料：建设全天候高可靠石墨烯储能电池关键技术、洛阳特种材料研究院二期轻合金材料产业园、电磁功能复合材料产业化应用等重点项目。

5. Promote the leapfrog development of strategic emerging industries and cultivate and e new momentum

Strengthen the top-level design of strategic emerging industries and future industries, accelerate the implementation of the three major system projects of industrial chain upgrad innovation platform construction and industrial ecological optimization, establish and impr the coordinated development mechanism of the industrial chain, focus on supplementing the c and strengthening the chain extension chain, and accelerate the construction of a strategic overall and Henan characteristics emerging industry ecosystem.

(5) Industrial chain upgrading project. Build ten emerging industrial chains. Deeply implem the “dual-length system” of industrial chain leaders and industry alliance presidents, and promote the modernization and upgrading of 10 emerging industrial chains, including new dis and intelligent terminals, biomedicine, energy conservation and environmental protection, r energy and connected vehicles, new generation artificial intelligence, network security, ne nylon materials, intelligent equipment, intelligent sensors, and <>G, to create a strategic overall industrial chain. Optimize the layout of industrial chain development, promote the coordinated matching of urban function positioning and industrial chain development, and ex more effective cross-departmental and cross-regional coordination mechanisms and vertical management structures of industrial chains. Compile a panorama of key industrial chains on rolling basis, focus on key links in the industrial chain, focus on supplementing the chair strengthening the chain and extending the chain cultivation chain, promote the cooperation “government, industry, academia, research and financial intermediary”, introduce and cultiv number of leading chain main enterprises and supporting enterprises with “killer” products,

accelerate the formation of upstream and downstream supporting production systems, and create a strategic and overall industrial chain.

Promote the development of industrial agglomeration clusters. Focus on the key directions and areas of industrial chain and supply chain security, accelerate the improvement of innovative public service complexes, carry out the creation of strategic emerging industrial clusters and future industrial clusters at or above the provincial level, plan to build strategic emerging industrial bases across administrative regions, promote inter-industrial chain development, inter-regional cooperation, and promote resource sharing, risk sharing and benefit co-creation among industrial clusters. Vigorously introduce a number of cluster eco-oriented enterprises to attract supporting enterprises and related institutions to gather. Promote collaborative innovation within the cluster and explore the development of the "industrial park + innovation incubator + industry fund + industry alliance" model. Support the integrated development of cluster enterprises and productive service industries such as information services, digital creativity, smart logistics, modern supply chains, and exhibition economy, and enhance the chain of cluster industries.

Promote the integrated development of industrial clusters and urban construction. Coordinate the construction of strategic emerging industrial clusters and future industrial clusters and urban agglomerations and metropolitan areas, accelerate the formation of a development trend of promoting cities with production, revitalizing production with cities, and integrating industry and cities, and create an industrial ecological complex that is innovation-led, factor endowment space-intensive, and suitable for creation, livability and industry. Highlight the role of main position, main battlefield and main engine of the development zone, support each development zone to select 1-2 leading industries, 1 emerging industry or future industry, concentrate cultivation of factor resources, and accelerate the formation of characteristic advantages. Guided by national strategic emerging industry clusters, promote the transformation of strategic emerging industry agglomeration areas from single production functions to urban comprehensive functions. Focus on the construction of industrial clusters, increase the construction of vocational education related platforms or bases, and promote the integrated development of industry and education. Support qualified industrial clusters to take the lead in deploying infrastructure and promote the digital transformation of traditional infrastructure. Build city and inter-city railways, highways and other transportation networks with industrial clusters as the core, and accelerate the improvement of comprehensive transportation hubs and logistics networks. Adhere to the integration of production, life and ecology, improve public service supporting facilities such as scientific research, medical care, education, culture and fitness and accelerate the formation of a number of typical demonstration cities (urban agglomerations) for the development of strategic emerging industries.

Strengthen the cultivation of market entities. Relying on the innovation base and innovation incubation carrier, strengthen the cultivation and introduction reserve of innovative and entrepreneurial talents, teams and innovative enterprises, improve the incubation system and innovation service system of small and medium-sized micro enterprises, accelerate the cultivation of a number of high-tech enterprises with distinctive characteristics, active innovation and strong competitiveness, support the listing of qualified high-growth small and medium-sized enterprises, and cultivate a number of "specialized, specialized and new" small giants, sir

champions, hidden champions and "gazelle" enterprises in subdivided fields. Establish a leading enterprise and leading enterprise cultivation and introduction database, strengthen the digital management capabilities of key enterprises and key links, cultivate a number of "chain master" enterprises and eco-oriented enterprises, and build a new industrial ecology that combines online and offline innovation collaboration, capacity sharing, and industrial chain and supply chain interconnection.

专栏 11：新兴产业集群高质量发展行动
<p>产业集群建设行动。加快建设郑州下一代信息网络、郑州信息技术服务、平顶山新型功能材料、许昌节能环保等国家级战略性新兴产业集群，培育建设一批省级战略性新兴产业和未来产业集群，每年滚动实施 500 个重大项目，增创 3—5 个国家级战略性新兴产业集群。</p> <p>领航企业培育行动。识别和培育一批具有影响力和创新力、产业链带动作用明显的链主企业，加大要素倾斜和支持力度，促进企业做大做强。发挥链主企业产业生态主导作用，开展“1+N”产业链合作伙伴行动，分类组建产业链合作伙伴共同体，优化产业链分工协作。加强战略性新兴产业和未来产业集群品牌建设，提升产业集群软实力。</p> <p>创新和公共服务综合体建设行动。制定实施产业创新和公共服务综合体评价机制和管理办法，建设一批区域性产业创新和公共服务综合体。支持探索跨集群、跨领域、跨行政区域提供“飞地”服务模式，推动科技创新、创业孵化、成果转化、质量监督、知识产权、科创金融、生态构建等服务要素、资源和主体集聚。</p> <p>新兴产业应用场景示范行动。加强高技术服务业高质量发展顶层设计，加快培育新技术、新产品、新业态、新模式。构建新兴产业应用场景供需清单和延伸场景清单，定期面向产业集群内市场主体发布新兴产业应用场景项目清单，实行“揭榜挂帅”“赛马制”择优推广，加快推动 5G、人工智能、新能源及智能网联汽车、大数据、工业互联网、量子信息等领域应用示范。</p>

(10) Innovation platform construction project. Actively create a high-end innovation platform. Adhering to the principle of "strengthening reserves, establishing echelons, and creating projects", we will build about 5 provincial laboratories such as Songshan Laboratory, Shennong Seed Industry Laboratory and Yellow River Laboratory, and strive to create national laboratories or branches (bases) in advantageous fields such as seed industry and new-generation information technology and in the Yellow River Basin ecological protection and system governance, animal immunology, advanced defense in cyberspace, medicinal chemistry, extreme materials, molecular catalysis, energy conversion, nano-optoelectronic materials and devices, Five state key laboratories have been cultivated and established on merit in the fields of mine safety science and engineering and a new laboratory system has been reorganized, integrated and built with high standards. Layout and build scientific research infrastructure such as ultra-short and ultra-strong laser platforms and quantum information technology basic support platforms. Create a number of new innovation platforms in the fields of optical communication, high-end bearings, diagnostic testing, safety chips, tunnel boring equipment and other fields. Accelerate the integration of high-end innovation resources in the province, promote the construction of world-class research universities and high-level research universities with characteristics, support the revitalization and reconstruction of the provincial Academy of Sciences and the Academy of Agricultural Sciences, enhance research capabilities in the fields of basic science and basic materials, and improve the ability to tackle key core technologies.

Build a common industrial technology research and development and transformation platform. Encourage innovative enterprises, universities, scientific research institutions and social groups to carry out industry-university-research cooperation in a variety of ways and form innovation consortiums. Encourage active docking with large institutes and institutes, and introduce new R&D institutions to jointly build; Guide new R&D institutions to find the core

positioning, focus on the improvement of innovation capabilities and the needs of industrial economic development, and promote the expansion and quality of new R&D institutions. Relying on leading enterprises and key parks, build a number of pilot bases for the transformation of scientific and technological achievements, and build a full-chain technology research and development and transformation system of "R&D center-pilot base-industrial park". Support the construction of intelligent sensors, intelligent equipment, biomedicine Zhengluoxin National Independent Innovation Demonstration Zone industrial common key technology innovation and transformation platform, realize the maturity and industrialization of major scientific and technological achievements, promote the transfer and diffusion of common key technologies in industry, and improve the level of industrial innovation. Improve the operation quality and efficiency of the National Technology Transfer Zhengzhou Center and the China (Xinxiang) Intellectual Property Protection Center, actively participate in the Central Region Technology Trading Market Alliance, strive to create a national demonstration zone for the transfer and transformation of scientific and technological achievements, promote the construction of a technology element trading market in Zhengzhou, and lay out and build a number of regional industrial technology transfer centers and intellectual property trading centers.

Accelerate the construction of innovation and entrepreneurship carriers. Strengthen the leading role of Zhengluoxin National Independent Innovation Demonstration Zone, accelerate the construction of Zhengkai Science and Technology Innovation Corridor, Zhongyuan Science and Technology City, Jinshui Science and Education Park, Zhoushan Science and Technology Innovation Valley, etc., and actively create a national regional science and technology innovation center. Standardize and promote the "smart island" dual innovation carrier, highlight the "small government big society" and market-oriented operation, strive to build a first-class innovation ecological microclimate, explore the formation of a standardized model that can be self-promoted and sustainable development, establish a "micro growth, small elevation, high and strong" cultivation mechanism, promote the agglomeration of various high-end factor resources, and build a number of emerging industry gathering areas, future industry pilot areas and innovation and entrepreneurship leading areas. Promote the improvement of quality and efficiency of national and provincial innovation and innovation demonstration bases, carry out pilot projects for the construction of innovation blocks, explore the construction of "upstairs and downstairs" innovation and entrepreneurship complexes, and establish an efficient transformation mechanism for scientific and technological achievements to "lay eggs along the way".

Deepen innovation, openness and cooperation. Introduce a number of large institutes and first-class universities to set up branches and R&D centers in our province, jointly build a number of major innovation platforms and emerging industry projects, and actively attract major innovation platforms such as national technology (industry, manufacturing) innovation centers to set up branches (sub-centers) in our province alone or relying on units in the province. Encourage backbone enterprises in the province to establish R&D centers in advanced areas and use "external brains" to carry out joint technological research. Continue to deepen docking and cooperation with areas with innovation advantages such as the Yangtze River Economic Belt, the Guangdong-Hong Kong-Macao Greater Bay Area, and the Beijing-Tianjin-Hebei region, establish an inter-provincial innovation resource sharing, joint scientific and technological research, and coordinated transformation of scientific and technological achievements overall planning and coordination.

mechanism, and jointly build a number of science and technology cooperation parks in areas conditions permit. Strengthen international scientific and technological exchanges and cooperation, actively integrate into the national "Belt and Road" science and technology innovation action plan, encourage the establishment of innovation incubation centers in overseas science and technology developed areas, and guide and support overseas high-level talents and teams and advanced technology projects to land in Yu.

专栏 12：创新体系构建行动
<p>高能级创新平台建设行动。高标准建设国家生物育种产业创新中心、国家农机装备创新中心和国家级计算郑州中心，加快建设中科院计算所大数据研究院、中科院遥感与数字地球研究所高光谱研究院、大数据分析与应用技术国家工程实验室郑州创新中心、北理工郑州智能研究院、软通动力郑州研究院、微软研究院自动化所等一批国内外知名院校研发中心。推动建设全国首家 5G 泛在低空测试基地和 5G 空域技术联合实验室，推进建设国家级无人机检验检测中心和具有全国示范作用的区域通航产业创新中心。推动密码科技国家工程研究中心等建设，支持纳米杂化材料应用技术国家地方联合工程研究中心、开封抗体药物开发技术国家地方联合工程实验室筹建申报国家工程研究中心等。鼓励建设国际联合实验室和离岸研究中心，提升创新国际化水平。</p> <p>创新成果转化应用行动。瞄准世界科学前沿方向，在关键领域、“卡脖子”的地方下大功夫，突破发展自主可控的核心技术和重点产品，打通研发尾部、量产首部从应用到推广的“最后一公里”，构建应用基础研究、技术熟化、产业孵化、企业对接、成果落地全链条转化机制。围绕产业体系构建，推进先进技术示范应用场景示范，加快推进郑洛新国家自主创新示范区产业共性关键技术创新与转化平台建设。</p> <p>创新创业载体建设行动。以郑开科学大道为轴线，推进郑州高新区、金水科教园区、龙子湖高校园区、开封职教园区联动发展，重点加快中原科技城、白沙科学谷、云湖智慧城（云湖大数据产业园）和西湖数字湾、中原数据湖等建设，营造技术、人才、数据、基金等集成协同的一流创新生态，加速集聚一批重大科创平台、知名高校院所、新型研发机构、创新型高成长企业，建设百里创新创业长廊，打造支撑全省、服务全国的创新策源地。</p>

(3) Industrial ecological optimization projects. Promote the all-round, all-angle and full-development of digital technology to empower the development of emerging industries, and in enterprise platform design, intelligent production, personalized customization, network collaboration, service-oriented extension, and digital management capabilities. Encourage financial institutions to innovate and develop financial products and services that adapt to characteristics of strategic emerging industries, increase inclusive financial support for strategic emerging industries and future industries, and build a financial support and guarantee system covering the entire chain of equity, creditor's rights, guarantees, and listing. Rely on the Zhengzhou Airport Economic Comprehensive Experimental Zone, China (Henan) Pilot Free Trade Zone, Zhengluoxin National Independent Innovation Demonstration Zone, China (Zhengzhou) Cross-border E-commerce Comprehensive Pilot Zone, National Big Data (Henan) Comprehensive Pilot Zone etc., strengthen cooperation with countries along the "Belt and Road", jointly promote the construction of international industrial cooperation parks, industrial "enclaves" and the Yellow River Plains-Yangtze River Delta Economic Corridor, and innovate the "enclave economy" cooperation model. Continue to deepen the reform of "decentralization, management and efficiency", and to create the province with the best business environment, the most active market mechanism and the leading province in reform exploration. In-depth implementation of the strategy of strengthening the province of intellectual property rights to enhance the value of intellectual property and the efficiency of transformation of achievements. Improve the market-oriented allocation mechanism for factors, accelerate the development of markets for technology elements and data elements, and promote the integrated development of technology and capital factors

专栏 13：产业生态优化行动

智能制造引领提升行动。推进新一代信息技术与制造业深度融合，实施“机器换人”专项行动，支持机器人（数控机床）规模化示范应用，推动建设智能车间和智能工厂，提升典型工业领域生产过程的智能化程度、生产效率、产品技术水平。

关键核心技术突破行动。实施战略性重大科技项目和重大科技专项，建立重大创新需求公开征集定期发布制度，滚动编制关键核心技术攻关清单。加快全钒液流电池、氢燃料电池、高效储能等颠覆性技术攻关研发，推动量子科技走在全国前列。攻克大气、水、土壤污染治理，电炉能效利用提升和工业资源化综合利用等领域关键核心技术。加快突破量子点发光二极管（QLED）核心技术。

产业链金融支撑行动。聚焦新兴产业和未来产业发展，发挥新兴产业投资引导基金和创业投资引导基金作用。改革政府出资产业投资基金管理机制，构建和完善省、市、县三级政府产业引导基金体系，建立投资容错和政府让利机制，打造覆盖“募投管退”全流程服务链条。

6. Improve planning and guarantee mechanisms and create a favorable environment for development

Focus on key areas, optimize industrial ecology, strengthen the market-oriented allocation talents, funds, land and other factors, fully dock with land and spatial planning at all levels, strengthen the analysis and layout research of strategic emerging industries and future industrial space demand, improve policy coordination and work coordination mechanisms with various localities and departments, promote the advanced industrial foundation and modernization of the industrial chain, and ensure the smooth completion of major tasks during the “14th Five Year Plan” period.

(1) Strengthen the organizational system guarantee system. Give play to the leading role of strategic emerging industries and future industry development planning, focus on strategic emerging industries and key areas of future industries, establish the “four ones” work promotion mechanism of “one provincial leader leading, one set of special work classes, one industrial research institute, and one industry guidance fund”, focus on extending the chain to supplement the chain and strengthen the chain, and improve the modernization level of the industrial chain. The Provincial Development and Reform Commission is responsible for leading the coordinative implementation of the plan, and the relevant departments of the province are responsible for studying and formulating relevant industrial development measures, and determining specific objectives and construction drawings. All provinces, municipalities and Jiyuan Demonstratic combine local conditions to strengthen the connection with this plan, formulate policies and measures to ensure the implementation of all work, and build a policy system for the development of emerging industries supported by provincial-level special support policies and local special support policies. Adhere to the “three distinctions”, establish a due diligence exemption orientation, and establish and improve a fault-tolerant mechanism to encourage innovation. The development of strategic emerging industries and future industries will be included in the government’s target management assessment system, establish and improve the statistical indicator system, monitoring mechanism, evaluation system and assessment system for strategic emerging industries and future industries, and improve the implementation of emerging industry policies and the supervision mechanism for the use of funds.

(2) Innovate the fiscal and financial support system. Strengthen government fund guidance, encourage all localities to increase support for the development of strategic emerging industries, and increase the cultivation of high-quality enterprises in strategic emerging industries through direct funding, equity investment, loan discounts, risk compensation, etc.



Give play to the role of the provincial venture capital guidance fund and the emerging industry investment guidance fund, and drive local and social capital to set up various funds such as angel investment, venture capital and industrial investment to provide medium and long-term capital for the development of emerging industries. Establish a fund reserve for high-quality enterprise projects, rely on regional equity markets to carry out regular roadshows and capital market business training for high-quality enterprises in emerging industries, and enhance enterprises' ability to connect with the capital market. Encourage financial institutions to vigorously develop credit products such as equity and debt linkage, supply chain finance and intellectual property pledge financing, promote the new financing model of "credit loan", and provide long-term and low-cost credit capital support for strategic emerging industry enterprises. Strengthen the establishment of financial rule of law and infrastructure, optimize the market credit environment, and give play to the basic role of credit in financial risk prevention and resolution and the protection of enterprises' lawful rights and interests. Implement and implement the identification and support policies for the first (set) of major technical equipment, the first batch of new materials, and the first edition of software products, and establish and strictly implement the government first-purchase system for innovative products.

(3) Improve the talent support system. Vigorously cultivate and introduce high-level talent urgently needed talents, support top talents to play a leading role, accelerate the gathering of innovative leading talents, cultivate and expand young top-notch talents, and accurately introduce urgently needed talents in key industries. Implement talent cultivation and introduction projects such as the "Central Plains Talent Program", establish a dynamic database of high-level and urgently needed talents, and carry out targeted talent introduction, on-the-job talent education, and accurate talent introduction. Give full play to the role of innovative subjects in gathering talents and using talents, create a high-end innovation platform, expand the autonomy of talent introduction, and improve the salary level of high-level talents. Establish an industrial development strategy expert think tank, optimize provincial-level talent introduction and training programs, smooth the "green" channel for high-level talent title evaluation, reform the management and transformation system of scientific and technological achievements, and give greater autonomy to the use of scientific research funds. Improve talent service guarantee policies and create a one-stop talent service platform. Establish an evaluation system for scientific and technological talents oriented by innovative value, ability and contribution, improve the classification and evaluation system and methods of scientific and technological achievements, and improve the income distribution mechanism that fully reflects the value of knowledge, technology and other elements.

(4) Build an opening up system. Actively dock with advanced regions, strengthen cooperation with first-class universities, scientific research institutes and industry leading enterprises, guide and support high-level talents and teams and advanced technology projects to land in Henan. Promote cooperation with countries along the "Belt and Road" in strategic emerging industries, accelerate the construction of bilateral international cooperation parks with characteristic industries, and support leading enterprises and state-level and provincial-level development zones to jointly build cooperation parks with developed countries and regions. Encourage enterprises in strategic emerging industries and future industries to explore international

markets, support enterprises to establish overseas marketing networks, increase the added value of export products, and vigorously cultivate export brands.

(1000) Improve the management system of key projects. Adhere to the "project is king", strengthen the reserve and classification guidance of major projects, establish a reserve bank of strategic emerging industries and major projects in future industries with dynamic management, plan and implement 10000 key industrial projects during the "14th Five-Year Plan" period, with a planned investment of 1 trillion yuan. Focusing on major projects, we will carry out "double recruitment and double introduction" in depth, and adopt special investment promotion, directional investment promotion, door-to-door investment promotion, business investment promotion and exhibition investment promotion to attract enterprises, funds and talents, and change "investment promotion" to "investment selection". Optimize the approval procedures for projects, and implement defective acceptance and parallel approval for the handling of key project procedures to ensure the first acceptance and the shortest time to complete. Improve supervision platform for major projects and the coordination and promotion system for project classification and classification, implement the whole process tracking service of the project and dynamically grasp the construction progress.

#### **Interpret the link**

Facing 2025 and looking forward to 2035, Henan will build a "456" strategic emerging industry and future industry system with core competitiveness

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Unit address: Zhengzhou City Zhengdong New District Zhengguang Road No. 11

Record serial number: 豫ICP备10005452号-12 Zheng Gongbei: 41010002000046 Government website identification code: 4100000

Technical support: Dahe network

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