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The provincial government issued the "14th Five-Year Plan for the Construction of a Strong Manufacturing Province in Shandong Province"

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Recently, the provincial government issued the "14th Five-Year Plan for the Construction of a Strong Manufacturing Province in Shandong Province", requiring all departments and units at all levels to seriously implement it.

The main contents of the "14th Five-Year Plan for the Construction of a Strong Manufacturing Province in Shandong Province" are as follows:

Shandong Province's "14th Five-Year Plan" manufacturing strong province construction plan

Manufacturing is the main body of the real economy and the key support for a prosperous and strong province. During the "Thirteenth Five-Year Plan" period, under the strong leadership of the Party Central Committee with Comrade Xi Jinping as the core, our province unswervingly took the road of new industrialization, continued to promote the upgrading of manufacturing quality and efficiency, and effectively accelerated the pace of conversion of new and old kinetic energy. The "2035th Five-Year Plan" period is the key five years for our province to deeply implement General Secretary Xi Jinping's strategic deployment on building a manufacturing power, seize the major opportunities of a new round of scientific and technological revolution and industrial transformation, accelerate the construction of a manufacturing province, and build new advantages for high-quality development. In order to clarify the overall goals, main tasks and major measures for the construction of a strong manufacturing province in the next five years, this plan is formulated in accordance with the Outline of the 2020th Five-Year Plan for National Economic and Social Development of Shandong Province and the Long-term Goals for 2021, with a planning base period of 2025 and a planning period of <>-<>.

1. Development environment

(1) The development of the "Thirteenth Five-Year Plan". During the "Thirteenth Five-Year Plan" period, in the face of the complex and severe external environment and arduous tasks of reform, development and stability, the province deeply implemented Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, adhered to the new

development concept as the guide, took supply-side structural reform as the main line, and focused on improving the quality and efficiency of development, strongly promoted "cage for bird, phoenix nirvana", unswervingly eliminated backward kinetic energy, transformed and upgraded traditional kinetic energy, cultivated and expanded new kinetic energy, the manufacturing ecosystem became more complete, and digital development accelerated in an all-round way. New historic achievements have been made.

1. The total scale is in the forefront. During the "Thirteenth Five-Year Plan" period, the added value of all industries continued to grow for five years, reaching 2020,23111.31 billion yuan in 6, accounting for 27.2% of the GDP, of which the added value of manufacturing accounted for 2020.8%. In 43, industrial enterprises above designated size achieved operating income of 4283.7 trillion yuan and profit of 59.3907 billion yuan, of which the manufacturing industry achieved 14.11 trillion yuan and <>. <> billion yuan respectively. The industrial economic strength of counties ranks first in the country, and <> counties (cities) and <> districts are shortlisted in the top <> of China's county industrial competitiveness map.

2. The kinetic energy conversion effect is obvious. During the "Thirteenth Five-Year Plan" period, the cumulative crude steel production capacity was reduced by 2110.4000 million tons, the oil refining capacity was integrated and eliminated by more than 1936 million tons, the implementation of the crude steel production capacity transfer plan of 241.4 million tons was promoted, the electrolytic aluminum production capacity was transferred by 2800.147 million tons, the coking production capacity was withdrawn by 2200 million tons, the synthetic ammonia production capacity was reduced by 199.84 million tons, and the tire production capacity was reduced by more than 2069 million tires; the number of chemical parks was reduced from 168 to 20, and 34,500 chemical production enterprises that did not meet the standards were closed and withdrawn. There were 7 hazardous chemical storage and operation enterprises, and the admission rate of chemical enterprises increased from less than 4% to 2017%. A total of more than 2020,28 industrial technological transformation projects with an investment of more than 9 million yuan have been implemented, and more than 25 trillion yuan has been invested in technological transformation, and a number of landmark major projects such as Yulong Island refining and chemical integration, advanced steel manufacturing base, world aluminum valley, and Shandong Heavy Industry Green Intelligent Manufacturing Industrial City have started construction. From 7 to 34, the added value of the new generation of information technology manufacturing, high-end equipment industry, and new energy and new materials industry increased by <>.<>%, <>.<>% and <>% respectively.

3. Fruitful results of technological innovation. As of 2020, a total of 253 provincial-level and above technological innovation demonstration enterprises have been cultivated, 1 national manufacturing innovation center and 24 industrial design centers have been established, 15 provincial manufacturing innovation centers and 340 industrial design centers have been cultivated. During the "Thirteenth Five-Year Plan" period, more than 4000,8 provincial-level technological innovation projects were implemented every year, a number of major technologies such as high-thermal efficiency diesel engines, large-scale stamping machine tools, adiponitrile preparation, and high-speed maglev transportation systems broke through foreign monopolies and filled domestic gaps, and key technologies such as heavy-duty commercial vehicle powertrain and front-wheel drive 2020-speed automatic transmission won the first prize of national scientific and technological progress. In 45, the output value of high-tech industries accounted for 1.12% of the total industrial output value, an increase of 6.<> percentage points over the end of the "Twelfth Five-Year Plan".

4. Digital empowerment continues to deepen. By 2020, a total of 5,5 1G base stations have been opened, achieving full coverage of the main urban areas of districted cities; a number of national-level platforms such as Jinan-Qingdao Artificial Intelligence Innovation Application Pilot Zone and Shandong Peninsula Industrial Internet Demonstration Zone have been approved for construction, and "Haier Kaos" and "Inspur Yunzhou" have become important "cross-

industry and cross-field" industrial Internet platforms in China, and 22,6 enterprises "go to the cloud and use the cloud". The total amount of digital economy exceeded 3 trillion yuan, with an average annual growth rate of nearly 20% during the "5848th Five-Year Plan" period, of which software business revenue was 5.82 billion yuan. With the deep integration of information technology and manufacturing, the penetration rate of digital design tools and numerical control rate of key processes in large and medium-sized enterprises reached 3.55% and 7.8% respectively, an increase of 2.13 and 6.62 percentage points respectively compared with the end of the "Twelfth Five-Year Plan"; the development level of enterprise integration reached 4.12, an increase of 93.<> compared with the end of the "Twelfth Five-Year Plan".

5. The strength of market entities has been enhanced. By 2020, the number of market entities reached 1185.8 million, an increase of nearly 570.98 million compared with the end of the "Twelfth Five-Year Plan", of which the proportion of private entities exceeded 360%; The number of small and medium-sized enterprises reached 26468.109 million, more than double the number at the end of the 5th Five-Year Plan. There are 500,76 industrial enterprises above designated size, including 500 enterprises with operating income of more than 130 billion yuan; 141 enterprises were shortlisted in the "World's Top 2534" and 709 enterprises were shortlisted in the "Top 13 Chinese Manufacturing Enterprises". During the "Thirteenth Five-Year Plan" period, a total of 20 national manufacturing single champion demonstration enterprises and products, <> specialized and special new "little giant" enterprises, <>, <> provincial "specialized, specialized and new" enterprises, <> gazelle enterprises, <> unicorn enterprises, and <> new leapfrog private enterprises were cultivated.

6. Industrial energy consumption is greatly reduced. By 2020, industrial energy consumption accounted for 75.6% of the total energy consumption of the whole society, down 3.3 percentage points from the end of the "Twelfth Five-Year Plan"; the proportion of industrial electricity consumption in the total electricity consumption of the whole society was 76.8%, down 3.6 percentage points from the end of the "Twelfth Five-Year Plan". In 2020, the consumption of industrial coal above designated size was more than 2015 million tons less than in 4100.

Although the development of manufacturing industry in our province has achieved remarkable results during the "Thirteenth Five-Year Plan" period, there are still problems of "big but not strong", "complete but not excellent" and "many but not refined". First, the industrial structure still needs to be optimized, and the structural contradictions of heavy chemical industry accounting for a large proportion and insufficient support for emerging industries have not been fundamentally resolved. Second, the technological innovation ability is weak, the intensity of enterprise R&D investment is not high, the support of innovative talents is insufficient, and the core competitiveness of the industry is not strong. Third, the level of agglomeration development is not high, and the industrial ecology of large and small enterprises integrating development, complementing each other's advantages and sharing benefits has not yet been effectively formed. Fourth, the constraints of traditional factors have intensified, and it is becoming more and more difficult to vacate development space. Fifth, digital transformation needs to be accelerated, the multiplier effect of the integration of new generation information technology and manufacturing has not yet been effectively exerted, and the construction of a new manufacturing system with data as the core driving factor has a long way to go.

(2) Study and judgment of the situation in the 14th Five-Year Plan. The "14th Five-Year Plan" period is the first five years after China has built a moderately prosperous society in an all-round way and achieved the first centennial goal, taking advantage of the situation to start a new journey of building a modern socialist country in an all-round way and marching towards the second centenary goal, and it is a key period for our province to fully implement Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, promote the transformation of new and old kinetic energy to achieve breakthroughs and advantages, accelerate the construction of a modern and strong province in the new era, and strive to achieve "walking in the forefront and comprehensively pioneering". At present, the great changes

unprecedented in the world in a century and the overall situation of the great rejuvenation strategy of the Chinese nation are intertwined, stirring and influencing each other, and the opportunities and challenges facing the construction of a strong province have new development and changes.

1. Significant opportunities. First, peace and development are still the theme of the times, the multipolarization of the world is irreversible, science and technology are accelerating iteration, mankind has entered a new era of interconnection, and globalization may slow down but not stagnate. Second, with significant advantages such as social system, governance efficiency, and comprehensive national strength, China will effectively gather global factor resources and become a major opportunity for China's manufacturing to shift from "following" to "running" and then to "leading". Third, China has embarked on a new journey of building a modern socialist country in an all-round way, accelerated the construction of a new development pattern of "dual circulation", and has long-term economic fundamentals, strong development resilience, and broad future space. Fourth, our province has accumulated a strong industrial foundation in long-term development, formed a huge market potential, and has a series of national strategic superposition advantages such as ecological protection and high-quality development of the Yellow River Basin, comprehensive pilot zone for conversion of new and old kinetic energy, China (Shandong) pilot free trade zone, China-Shanghai Cooperation Organization local economic and trade cooperation demonstration zone, and national military-civilian integration innovation demonstration zone, providing a "golden period" for high-quality development in the new era.

2. The main challenges that exist. First, the instability and uncertainty of the external environment have increased significantly, the world's unprecedented changes in a century are superimposed on the global pandemic of the new crown pneumonia epidemic, the international political, economic and security pattern has entered a period of deep adjustment and reconstruction, anti-globalization, populism, unilateralism, hegemonism have risen, trade frictions, geopolitics, industrial competition and other issues are intertwined, and China's industrial chain and supply chain are increasingly affected by the international environment. Second, China's manufacturing industry is undergoing profound changes, the digital economy and the real economy are deeply integrated, the development momentum is accelerating the transformation from the external driving force of using international technology spillover to the endogenous drive of independent innovation, the production mode is accelerating the transformation from the traditional production mode to the direction of intelligence, greening and service, and the supporting factors are accelerating the transformation from primary production factor input to relying on knowledge, technology, data, human capital and other advanced production factors. The organizational relationship has accelerated the transformation from the production relationship between upstream and downstream enterprises in the industrial chain to the network and coordination of various subjects, forming a new logic for the high-quality development of the manufacturing industry in the coming period. Third, domestic regional competition has intensified, and our province is facing the severe test of "the pacesetter goes faster and faster, and the pursuer catches up closer and closer" and "if you do not advance, you will retreat greatly, and if you advance slowly, you will retreat small".

Generally speaking, the "14th Five-Year Plan" period is still an important strategic opportunity period for our province to accelerate the construction of a strong manufacturing province, as long as we adhere to the system concept, analyze the situation with a comprehensive, dialectical and long-term vision, make good use of the major opportunities of industrial upgrading, consumption upgrading, technological revolution and global pattern changes, give full play to institutional advantages, market advantages, scale advantages, talent advantages and supporting advantages, and go all out to deal with various risks and challenges, we will have the full conditions and ability to cultivate new opportunities in the crisis and open up a new situation in the changing situation.

Second, the general idea

(1) Guiding ideology. Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fully implement the spirit of the 19th Party Congress and the 2nd, 3rd, 4th and 5th Plenary Sessions of the 19th CPC Central Committee, conscientiously implement General Secretary Xi Jinping's important expositions on manufacturing a strong country and important instructions and requirements for Shandong's work, closely focus on the overall deployment of the provincial party committee and provincial government's "seven in the forefront" and "breakthroughs in nine strong provinces", base on the new development stage, complete, accurate and comprehensive implementation of the new development concept, take the initiative to serve and integrate into the new development pattern, and adhere to the general tone of seeking progress while maintaining stability. With the theme of promoting high-quality development, deepening supply-side structural reform as the main line, reform and innovation as the fundamental driving force, meeting the people's growing needs for a better life as the fundamental purpose, and taking the transformation of new and old kinetic energy into advantages as the goal, we will coordinate development and safety, resolutely eliminate backward kinetic energy, resolutely transform and enhance traditional kinetic energy, resolutely cultivate and expand new kinetic energy, accelerate the construction of a manufacturing strong province, build an advanced manufacturing base with global competitiveness, and provide strong support for the construction of a modern and strong province in the new era.

(2) Basic principles.

1. Effective markets and active governments work together. Give full play to the decisive role of the market in the allocation of resources, strengthen the main position of enterprises, and stimulate market vitality to the greatest extent. Give better play to the guiding role of the government, strengthen the guidance of strategic planning, deepen the reform of systems and mechanisms, improve the efficiency of factor allocation, improve service efficiency, and create a good environment.

2. Expand domestic demand and stabilize external demand. Twist the strategic base point of expanding domestic demand, form a higher level of dynamic balance between demand driving supply and supply creating demand, so that production, distribution, circulation and consumption rely more on the domestic market. Implement a larger scope, wider fields and deeper opening-up, promote the "dual embedding" of domestic and international industrial chain and supply chain, and build an open development pattern of efficient integration and win-win cooperation.

3. Efficient linkage between scientific and technological innovation and industrial innovation. Adhere to scientific and technological self-reliance and self-improvement, unswervingly implement the innovation-driven development strategy, deeply promote source innovation, technological innovation and industrial innovation, strengthen the research of key core technologies of the "stuck neck", and create an important innovation highland in the country. Build an innovation ecology that closely integrates science and technology, education and industry, deploy innovation chains around the industrial chain, layout the industrial chain around the innovation chain, and accelerate the improvement of industrial basic capabilities and the modernization level of the industrial chain.

4. Coordinate and promote scale growth and quality and efficiency improvement. Always adhere to economic construction as the center, continue to liberate and develop productive forces, maintain a reasonable manufacturing growth rate, and better support the development of service economy, social progress and improvement of people's livelihood. Adhere to the principle of quality first and benefit first, establish and improve the high-quality standard system, vigorously develop advanced manufacturing, increase the proportion of advanced production capacity, and promote the manufacturing industry to leap to the middle and high end of the value chain.

5. Integrated development of digital economy and real economy. Seize the opportunity of a new round of scientific and technological revolution and industrial transformation, promote the deep integration of a new generation of information technology and manufacturing, greatly improve the level of digital, networked and intelligent development

of enterprises, and accelerate the reconstruction of manufacturing production methods and enterprise forms. Actively cultivate and expand the digital economy, build internationally competitive digital industry clusters, and provide strong support for cultivating new economic development and forming new momentum for development.

6. Cultivating strong enterprises and optimizing the ecology are closely connected. Strengthen the gradient cultivation of high-quality enterprises, promote leading enterprises to enhance the leading and integration capabilities of industrial chains, supply chains and innovation chains, improve the innovation capabilities and specialization level of small and medium-sized enterprises, create an industrial ecology of collaborative innovation, resource sharing and integrated development of large and small enterprises, and improve the innovation, manufacturing and service capabilities of the whole industry.

7. Integrate industrial development and industrial safety. Adhere to bottom-line thinking, enhance risk awareness, carry forward the spirit of struggle, focus on enhancing the independent and controllable ability of the industrial chain and supply chain, and build a solid industrial safety barrier. Continue to improve the level of safe production and ecological environmental protection in the manufacturing industry, and continuously enhance the people's sense of gain, happiness and security.

(2025) Main objectives. By <>, the province will be basically built into a strong manufacturing province, the manufacturing production mode, organizational mode and industrial form will achieve historic, turning and overall changes, and a modern manufacturing system with Shandong characteristics will be initially formed, leading and driving the province's economic and social development ability to be significantly enhanced, and the high-quality development of manufacturing industry will always be in the first square of the country, becoming an advanced manufacturing center with global competitiveness.

1. The economy runs smoothly and healthily. The proportion of manufacturing added value in GDP has risen steadily, striving to reach more than 28%; The growth rate of annual industrial investment is higher than that of fixed asset investment in the whole society, and the growth rate of investment in technological transformation is higher than that of industrial investment; The indicator of "mu production efficiency" in the manufacturing industry has been significantly improved, and the profit margin of operating income of industrial enterprises above designated size has reached about 6%.

2. The ability to innovate has been significantly enhanced. The proportion of R&D expenditure of industrial enterprises above designated size to operating income is about 2.2%, the proportion of enterprises with R&D activities is about 50%, the proportion of enterprises with R&D institutions is about 30%, the output value of high-tech industries accounts for about 50% of the total output value of industries above designated size, and the problem of "stuck neck" in key areas is basically solved.

3. The industrial ecology is more optimized. The gradient cultivation system of high-quality enterprises has been initially completed, the "pilot" leading enterprises and "specialized, specialized and new" small and medium-sized enterprises have been integrated and developed, advanced standards, quality management and independent brand systems have been more sound, and the manufacturing industry ecology has been further optimized. There are about 4 enterprises with operating income of more than 15 billion yuan, and more than 80 enterprises with 200 billion level; The domestic advanced level of technology and equipment accounts for more than <>%, and the domestic market share of leading products ranks first in the country of more than <>.

4. Comprehensive deepening of digital empowerment. The level of industrial digitalization has been greatly improved, and the comprehensive digitization rate of key business links of industrial enterprises above designated size has reached more than 70%, and the networking rate of digital equipment has reached about 70%. Among the industrial enterprises above designated size, about 3% have reached the level of integration and upgrading of

industrialization and industrialization (Industry 0.32) or above, and about 4% have reached the level of comprehensive integration of industrialization and industrialization (Industry 0.15). The pace of digital industrialization has accelerated in an all-round way, and the added value of the core industries of the digital economy has accounted for about 10% of GDP.

5. Green transformation continues to advance. Industrial enterprises above designated size have basically established carbon emission measurement or measurement systems, all eligible industries and enterprises are included in carbon trading, and indicators such as energy consumption, water consumption, and pollutant emissions per unit of industrial added value continue to decline; Green and low-carbon technologies have been more widely promoted and applied, and ultra-low emission transformation has been basically completed in key industries, and an efficient, clean, low-carbon and circular green manufacturing system has been initially constructed.

山东省“十四五”制造强省建设主要指标			
序号	指标名称	2020 年	2025 年
综合质效	制造业增加值占 GDP 比重（%）	27.2	28 以上
	规模以上工业企业营业收入利润率（%）	5.08	6 左右
创新能力	规模以上工业企业 R&D 经费支出占营业收入比重（%）	1.46 (2019 年)	2.2 左右
	规模以上工业企业中有研发活动企业占比（%）	26.2 (2019 年)	50 左右
	规模以上工业企业中有研发机构的占比（%）	9.5 (2019 年)	30 左右
结构优化	高新技术产业产值占规模以上工业总产值比重（%）	45.1	50 左右
	数字经济核心产业增加值占 GDP 比重（%）	4.8	10 左右
智能绿色	规模以上工业企业数字化设备联网率（%）	51.4	70 左右
	工业企业关键业务环节全面数字化率（%）	64.8	70 以上
	单位工业增加值能源消耗降低（%）	24.5（*）	17 左右（*）
智能绿色	单位工业增加值用水量降低（%）	13.56（*）	5（*）
企业培育	省级及以上制造业单项冠军企业和产品数量（个）	501	900 左右
	省级及以上“专精特新”企业数量（家）	2534	4000 左右

注：标 * 数据分别为单位工业增加值能源消耗降低（%）、单位工业增加值用水量降低（%）的“十三五”和“十四五”累计值；“十四五”目标值最终以省政府确定的约束性指标为准。

Third, the development direction of key industries

Closely focusing on "seven leading positions" and "breakthroughs in nine strong provinces", adhere to problem-oriented, goal-oriented and result-oriented, focus on building a globally important advanced manufacturing base, accelerate the development of a modern industrial system led by new kinetic energy, and strengthen the new advantages of "Made in Shandong" in the new era.

(1) Eliminate inefficient and backward production capacity in accordance with the law. Adhere to the principle of "reduction and substitution is the norm, and equal substitution is the exception", focus on key industries such as steel, refining, coke, cement, tires, and chemicals, and organize the transfer, reduction, integration, and shutdown according to environmental protection, safety, technology, energy consumption, and benefit standards, accelerate the elimination of backward production capacity, resolve excess production capacity, and withdraw inefficient production capacity, and continue to free up space for advanced production capacity.

1. Steel. Strictly control the total steel production capacity of the province, and accelerate the transfer and agglomeration of steel production capacity to key steel industry bases. By 2025, coastal steel production capacity will account for more than 70%.

2. Refining. Shut down the production capacity of georefineries involved in the integration of the Yulong Island refining and chemical integration project. According to the implementation of major petrochemical projects, promote

the integration and transfer of georefining capacity in densely populated urban areas and refining capacity of 300 million tons or less that have not achieved refining and chemical integration. Encourage central enterprises to implement "near limit and remote relocation" in refineries in the central urban areas of our province to accelerate the integration and improvement of refining capacity.

3. Coke. Accelerate the reduction of coke production capacity in the province, eliminate coke ovens and heat recovery coke ovens with a carbonization chamber height of less than 5.5 meters, and promote the reduction and replacement of coke ovens with a carbonization chamber height of 5.5 meters or more. Promote the layout of "steel and coke integration", continue to implement "steel coking" and "coal production" to ensure that the coking steel ratio is stable at about 0.4.

4. Cement. In addition to special cement clinker and chemical supporting cement clinker production lines, the cement clinker production line with a diameter of 2500.3 meters and below can be reduced and replaced by the integration and withdrawal of cement clinker production lines of 2,4000 tons/day and the diameter of cement mills with a diameter of 3.8 meters or less. It is strictly forbidden to add cement clinker and grinding capacity, and it is strictly forbidden to transfer cement clinker and grinding production capacity outside the province.

5. Tires. Enterprises with an annual production capacity of less than 120.500 million all-steel radial tires (except engineering tires, aviation tires, and wide-section tubeless) and semi-steel radial tires (except low-end tires, high-end racing tires, and ultra-low-section tires) with an annual production capacity of less than <>. <> million can be reduced and replaced. Eliminate rubber mixers that cannot realize closed automatic feeding, and vulcanization equipment in radial tire industry that cannot realize nitrogen filling process.

6. Chemical industry. Focusing on key areas such as chlor-alkali, synthetic ammonia, chemical pesticide raw drugs, and synthetic materials, organize and carry out comprehensive sorting and investigation, and include chemical enterprises that do not meet the requirements of relevant standards and have no hope of transformation and upgrading, incomplete procedures and cannot be perfected, and close them down in accordance with laws and regulations.

专栏 1 低效落后产能标准

钢铁。环保标准：《钢铁工业大气污染物排放标准》（DB37/990—2019），《钢铁工业水污染物排放标准》（GB13456—2012），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《金属冶炼企业禁止使用的设备及工艺目录（第一批）》（安监总管四〔2017〕142号），《冶金行业较大危险因素辨识与防范指导手册》（安监总管四〔2016〕31号），《工贸行业重大生产安全事故隐患判定标准（2017版）》（安监总管四〔2017〕129号），《冶金企业安全生产标准化评定标准》（安监总管四〔2011〕110号）；技术标准：400立方米及以下炼铁高炉、30吨及以下炼钢转炉、30吨及以下炼钢电炉、化铁炼钢、用于熔化废钢的工频感应炉、用于熔化废钢的中频感应炉（国家标准），不符合全省钢铁产业发展规划布局的钢铁产能（省定标准）；能耗标准：《粗钢生产主要工序单位产品能源消耗限额》（GB21256—2013），《高炉炼铁工序单位产品能源消耗限额》（DB37/750—2015）；效益标准：单位用地税收2.6万元/亩、单位能耗税收0.014万元/吨标煤、人均主营业务收入177.6万元/人（省定标准）。

地炼。环保标准：《石油炼制工业污染物排放标准》（GB31570—2015），《挥发性有机物排放标准第6部分：有机化工行业》（DB37/2801.6—2018），《区域性大气污染物综合排放标准》（DB37/2376—2019），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《原油加工及石油制品制造业企业生产安全事故隐患排查治理体系实施指南》（DB37/T3195—2018），《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号）；技术标准：200万吨/年及以下常减压炼油装置（国家标准），300万吨/年及以下未实现炼化一体化的常减压炼油装置（省定标准）；能耗标准：《炼油企业单位能量因数能耗限额》（DB37/755—2015）；效益标准：单位用地税收19.9万元/亩、单位能耗税收0.233万元/吨标煤、人均主营业务收入149.9万元/人（省定标准）。

焦炭。环保标准：《炼焦化学工业污染物排放标准》（GB16171—2012），《区域性大气污染物综合排放标准》（DB37/2376—2019），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《煤焦化行业企业生产安全事故隐患排查治理体系实施指南》（DB37/T3250—2018），《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号）；技术标准：土法炼焦（含改良焦炉）、炭化室高度小于4.3米顶装焦炉（国家标准），炭化室高度小于5.5米焦炉及热回收焦炉（省定标准）；能耗标准：《焦炭单位产品能源消耗限额》（DB37/747—2015）；效益标准：单位用地税收5.3万元/亩、单位能耗税收0.066万元/吨标煤、人均主营业务收入203.5万元/人（省定标准）。

水泥。环保标准：《建材工业大气污染物排放标准》（DB37/2373—2018），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《工贸行业重大生产安全事故隐患判定标准（2017版）》（安监总管四〔2017〕129号），《建材行业较大危险因素辨识与防范指导手册》（安监总管四〔2016〕31号），《水泥企业安全生产标准化评定标准》（安监总管四〔2011〕55号）；技术标准：普通水泥干法中空窑、水泥机立窑、立波尔窑、湿法窑、直径3米以下普通水泥磨机（国家标准），2500吨/日及以下的普通水泥熟料生产线、直径3.2米及以下水泥磨机（省定标准）；能耗标准：《水泥单位产品能源消耗限额》（DB37/836—2015）；效益标准：单位用地税收0.075万元/亩、单位能耗税收0.042万元/吨标煤、人均主营业务收入118.1万元/人（省定标准）。

轮胎。环保标准：《挥发性有机物排放标准第6部分：有机化工行业》（DB37/2801.6—2018），《区域性大气污染物综合排放标准》（DB37/2376—2019），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《轻工行业（包括橡胶行业在内）较大危险因素辨识与防范指导手册》（安监总管四〔2016〕31号）；技术标准：50万条/年及以下斜交轮胎生产线、以天然棉帘子布为骨架的轮胎生产线（国家标准），年产能120万条以下的普通全钢子午胎企业、年产能500万条以下的普通半钢子午胎企业（省定标准）；能耗标准：《轮胎单位产品能耗限额》（DB37/756—2018）；效益标准：单位用地税收0.83万元/亩、单位能耗税收0.02万元/吨标煤、人均主营业务收入52.32万元/人（省定标准）。

化工。（1）氯碱行业。环保标准：《烧碱、聚氯乙烯工业污染物排放标准》（GB15581—2016），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号），《化工企业生产安全事故隐患排查治理体系细则》（DB37/T3010—2017）；技术标准：不属于废盐综合利用的隔膜法烧碱生产装置、使用汞或汞化合物的烧碱生产装置（国家标准），未完成膜极距改造、不在化工园区和重点监控点的氯碱企业（省定标准）；能耗标准：《烧碱单位产品能耗限额》（DB37/753—2015）；效益标准：单位用地税收2.63万元/亩、单位能耗税收0.013万元/吨标煤、人均主营业务收入133万元/人（省定标准）。（2）合成氨。环保标准：《区域性大气污染物综合排放标准》（DB37/2376—2019），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号），《化工企业生产安全事故隐患排查治理体系细则》（DB37/T3010—2017）；技术标准：半水煤气氨水液相脱硫、天然气常压间歇转化工工艺制合成氨（国家标准）；能耗标准：《合成氨单位产品能源消耗限额》（DB37/757—2015）；效益标准：单位用地税收2.43万元/亩、单位能耗税收0.0045万元/吨标煤、人均主营业务收入103.3万元/人（省定标准）。（3）化学农药原药。环保标准：《农药制造工业大气污染物排放标准》（GB39727—2020），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号），《化工企业生产安全事故隐患排查治理体系细则》（DB37/T3010—2017）；技术标准：钠法百草枯生产工艺、敌百虫碱法敌敌畏生产工艺、小包装（1公斤及以下）农药产品手工包（灌）装工艺及设备（国家标准）；效益标准：单位用地税收0.33万元/亩、单位能耗税收0.013万元/吨标煤、人均主营业务收入8.33万元/人（省定标准）。（4）合成材料。环保标准：《合成树脂工业污染物排放标准》（GB31572—2015），《烧碱、聚氯乙烯工业污染物排放标准》（GB15581—2016），《流域水污染物综合排放标准》（DB37/3416—2018）；安全标准：《危险化学品企业安全风险隐患排查治理导则》（应急〔2019〕78号），《化工企业生产安全事故隐患排查治理体系细则》（DB37/T3010—2017）；技术标准：高汞催化剂和使用高汞催化剂的乙炔法聚氯乙烯生产装置（国家标准），用火直接加热的涂料用树脂、四氯化碳溶剂法抽取氯化橡胶生产工艺（国家标准）；能耗标准：《聚氯乙烯树脂单位产品能源消耗限额》（GB30527—2014）；效益标准：单位用地税收17.1万元/亩、单位能耗税收0.04万元/吨标煤、人均主营业务收入578万元/人（省定标准）。

Note: In accordance with relevant regulations, the standards listed in column 1 will be implemented until 2022; After the expiration of the period, it will be implemented in accordance with the new regulations.

(2) Transform and upgrade traditional advantageous industries. Adhere to the principle of "consolidating scale advantages and improving quality and efficiency", deeply implement the digital transformation of the manufacturing industry, increase the intensity of digital, networked and intelligent technology transformation, roll out the "10,000 technological transformation, 10,000 enterprise transformation", comprehensively improve the modernization level of traditional advantageous industries, and accelerate the extension to the middle and high end of the value chain. By the end of the "14th Five-Year Plan", the scale of chemical, building materials, tires, casting, food and other industries will maintain the first place in the country, the scale of steel, nonferrous metals, home appliances, papermaking and other industries will rank among the top three in the country, and the level of technological modernization, product refinement, research and development and innovation capabilities, and green safety development will be consolidated or enter the advanced level of the same industry in the country.

1. Chemical industry. Focusing on refining and chemical integration, marine chemical industry, coal chemical industry, fine chemical industry and other industries, focus on the development of ethylene, propylene, butene, benzene, toluene, PX, fluorosilicon, coal-based fine chemicals, high-end functional chemicals and other industrial chains, cultivate leading enterprises, and build a world-class green chemical industry cluster. Implement the integration and reduction and replacement of refining capacity, support the in-depth merger and reorganization of refining and chemical enterprises, promote the transformation of "oil reduction and increase", and create an industrial model of "oil head, incarnation, and high tail". Build Yantai Yulong Island refining and chemical integrated petrochemical industrial base. Eliminate intermittent atmospheric pressure fixed-bed gasifiers, accelerate the implementation of clean coal gasification technology, and accelerate the extension of the industrial chain of comprehensive utilization of coal-to-synthesis gas and coke oven exhaust gas. Consolidate the advantages of the traditional chemical industry, increase the research and development of basic special materials, vigorously develop new functional chemical materials, and improve the self-sufficiency guarantee ability and preparation technology level of key materials. By 2025, the output value of the chemical industry will reach 2.65 trillion yuan; the output value of enterprises in chemical parks and enterprises in key monitoring points will account for more than 80% of the industry; The yield of gasoline, coal and diesel oil products dropped to about 40%.

2. Steel. Accelerate the construction of Japan-Linxi coastal advanced steel manufacturing industrial base and Lai-Thailand inland fine steel production base, and increase the proportion of steel production capacity in coastal areas. Focus on the development of steel for equipment manufacturing, steel for new infrastructure, high-end stainless steel, and high-quality special steel, vigorously promote the deep processing of steel, and promote the efficient recycling of scrap steel. By 2025, the total output value of iron and steel smelting, rolling, and deep processing and distribution industries will exceed 1 trillion yuan; High-end fine steel accounts for 50%, the steel deep processing rate reaches about 25%, and scrap accounts for about 30% of steel raw materials.

3. Non-ferrous metals. Focus on aluminum, copper, gold and other characteristic advantageous industries, vigorously develop deep processing, and create an industrial base with national competitiveness. Give full play to the scale advantages of the aluminum industry, effectively enhance the ability of industrial innovation, deeply promote the extension of the industrial chain, and focus on the development of high-performance aluminum alloy forgings, automotive aluminum alloy plates, aviation aluminum and other high value-added products. Strengthen the fine copper industry chain, focus on the development of lead frame copper alloy strip, new contact wire, large-diameter corrosion-resistant copper alloy pipe and other products. Enrich and extend the gold industry chain, and vigorously

develop deep-processed products such as gold wire, gold salt, and high-end gold jewelry. By 2025, the output value of aluminum and copper industries will reach 8000 billion yuan and 2800 billion yuan respectively; Annual gold production is stable at more than 160 tons; The ratio of aluminum production to electrolytic aluminum production is striving to reach 2.5:1.

4. Building materials. Improving ultra-low emission levels in cement production lines and developing high-quality, high-durability cement and concrete and building waterproofing materials; Focus on the development of high-performance glass and increase the proportion of original glass for deep processing; Accelerate the research and development of high-efficiency molding and preparation processes for continuous fiber-reinforced thermoplastic composites, high-performance special glass fiber industrialization manufacturing and other technologies, and realize the localization of related glass fiber and composite material production equipment; Encourage the production of high-temperature non-oxide ceramics, water-saving sanitary ceramics, lightweight thermal insulation ceramic tiles, thermal insulation decorative composite products, and strive to create the brand of "contemporary national kiln". Actively develop new building materials for the integration of building energy conservation, and encourage enterprises to use various industrial solid wastes to produce green building materials; Accelerate the development of the Photovoltaic Building Integration (BIPV) model by using new energy and new technologies; Vigorously develop prefabricated buildings, explore and promote the integrated development of development, design and construction of prefabricated building projects, and promote modular, standardized and integrated research and development of building parts and accessories. By 2025, the output value of the building materials industry will reach 7000 billion yuan.

5. Tires. Vigorously develop high-end products such as aviation tires, construction machinery tires, ultra-high-performance tires, high-end special tires, low-noise tires, and air-flat tires, and increase the research and development and promotion of new synthetic rubber, new environmental protection additives, new tire frame materials, and tire manufacturing equipment. Develop new environmentally friendly and energy-saving tire retreading technology to improve the environmentally friendly treatment capacity and reuse rate of recycled rubber. By 2025, the output value of the tire industry will reach 2000 billion yuan; There are 100 tire companies with sales revenue of more than 8 billion yuan, of which more than 200 are more than 2 billion yuan, and 1-2 enterprises have entered the top 10 in the global tire industry.

6. Casting. Strengthen the research of key common technologies in casting, vigorously develop high-end equipment such as advanced automatic casting, waste sand recycling, high-efficiency and energy-saving smelting, and casting 3D printing, and accelerate the digital transformation of foundry enterprises. Vigorously develop green casting, increase the application of energy-saving and environmental protection technologies, processes and equipment, and improve the low-carbon and circular development level of the foundry industry. Promote the construction of characteristic foundry industrial parks, develop high-level regional foundry centers, and promote the agglomeration of foundry production capacity to advantageous areas and high-quality enterprises. By 2025, the output value of the casting industry will reach 1000 billion yuan.

7. Textile and clothing. Accelerate the research and industrialization of key technologies such as new fiber materials, high-end textile manufacturing, intelligent green printing and dyeing, fashion home textiles and clothing, high-end industrial textiles, and intelligent textile machinery, and expand and strengthen a number of characteristic industrial clusters. Promote the digital development of textile equipment in the fields of fiber materials, spinning and weaving, printing and dyeing, promote the digital transformation of industries, and promote new models such as large-scale personalized customization and flexible production. Guide enterprises to vigorously explore domestic and foreign markets, innovate marketing models, accelerate the shortcomings of creative design, and promote the development of high-end, branding, fashion and personalized industry. By 2025, the output value of the textile and garment industry

will reach 3000 billion yuan, create more than 20 characteristic industrial clusters with strong influence in the country, and cultivate about 12 national textile and garment creative design pilot demonstration parks (platforms).

8. Food. Accelerate the development of infant formula food, elderly food, nutritional and health food, traditional specialty foods and functional foods that meet the needs of specific groups, promote the development of the whole industrial chain and cluster of grain and oil, fruits and vegetables, meat products, aquatic products, wine and other industries, improve the level of intensive processing, create a gathering area for characteristic advantageous industries, and cultivate a number of national leading backbone enterprises and high-end brands. Promote the establishment of creditworthiness management systems and quality and safety traceability systems, and encourage food enterprises to introduce advanced equipment and quality inspection technologies such as intelligent equipment, green packaging, three-dimensional warehousing, and online testing instruments. Accelerate the integration and application of the industrial Internet and the food industry, and provide services such as product supply chain management, digital marketing, and social evaluation of quality brands. Actively build a green system for food manufacturing and improve the comprehensive utilization level of by-products in the food industry. By 2025, the output value of the food industry will exceed 1 trillion yuan; Cultivate about 20 provincial-level and above characteristic advantageous food industry clusters and more than 10 well-known brands.

9. Home appliances. To improve and strengthen traditional products such as refrigerators, freezers, TVs, washing machines, air conditioners, kitchen appliances, etc., develop and produce dishwashers, integrated stoves, wine cabinets, sweepers, home theaters, household central air conditioners, fresh air systems, whole house water purification systems and other emerging home appliance categories. Strengthen product design and development capabilities and upgrade and transformation of key components, continuously develop energy-saving and environmental protection, network intelligence, comfortable and healthy home appliance products, encourage the development of home appliance combination products and integrated products based on the Internet of Things and artificial intelligence technology, promote personalized customization, and improve product applicability, quality stability and the degree of refinement of high-end product processing. Continue to optimize the home appliance industry chain, accelerate the improvement of supporting levels in the province, and build a world-class smart home appliance industry cluster. By 2025, the output value of the home appliance industry will reach 3000 billion yuan.

10. Papermaking. Accelerate the construction of a diversified raw material supply system, vigorously develop paper-based functional materials, and focus on the development of high-tech and high-value-added products such as high-grade cultural paper, special paper and cardboard, medium and high-grade packaging paper and cardboard, and high-grade household paper. Encourage enterprises to carry out digital and intelligent transformation of production lines, extend the industrial chain, and actively expand to the production of paper products. By 2025, the output value of the paper and paper products industry will reach 1700 billion yuan.

专栏 2 传统行业产业布局

化工。青岛市、淄博市、东营市、烟台市、潍坊市、威海市、日照市、滨州市、菏泽市重点推进炼化一体化，石化盐化煤化工融合发展，重点发展高性能工程塑料、高端树脂、合成纤维、合成橡胶、可降解塑料等产业链，离子交换膜、质子膜等膜材料，液晶材料、OLED 材料、电子级氟氯酸、光刻胶、抛光垫与研磨液、芯片散热/封装材料等电子化学品和信息材料。济南市、枣庄市、济宁市、泰安市、德州市、临沂市、聊城市立足煤盐化石化产业基础，提升深加工水平，加快向工程塑料、尼龙、光伏材料等下游产品延伸发展，提升终端产品附加值。

钢铁。日照市重点发展海工板、无头轧制薄规格强度级别 $>700\text{MPa}$ 高强度、高强耐候钢、高级别管线用钢、汽车成形用钢等高端热轧产品。济南市重点发展齿轮钢、汽车结构用钢、工模器具钢、锅炉容器板和工程机械用钢、不锈钢等高端产品。青岛市重点发展帘线及胎圈钢丝用钢、特种焊接焊丝用钢、高强弹簧扁钢 $>1600\text{MPa}$ 、工程机械圆钢、桥梁缆索用钢等高端产品。泰安市重点发展超高强度预应力混凝土用螺纹钢、超高尺寸精度精轧锚杆钢筋、超高强度电力角钢等高端工程建设用钢。临沂市重点发展高强度耐腐蚀海工用钢、高性能轴承钢、齿轮钢、弹簧钢、高强度建筑用钢，300 系、400 系及双相不锈钢，超低碳、超纯净、超纯等高端不锈钢材料，镍基复合材料。潍坊市重点发展齿轮钢、轴承钢和核心基础零部件用钢，提升焊丝、钢绞线、子午线轮胎用胎圈钢丝和钢帘线等产品品质，支持发展发动机、汽车、农机、高铁特种用钢等产品。

有色金属。滨州市重点发展活塞、轮毂、汽车用板、汽车底盘用高性能铝合金锻件等中高端产品，铝代钢、代木、代塑等终端产品，铝镁合金、铝钛合金、铝锂合金、石墨烯铝合金等铝基复合材料。聊城市重点围绕汽车轻量化、铝合金功能材料、工业型材、建筑模板、高端幕墙、市政家居等领域及铝代钢、代木、代塑等终端消费品，发展铝精深加工产品；加快发展铝铜冶炼、高性能铜及铜合金板带材、高精密铜及铜合金箔材、高端电缆芯等产品，打造“铝铜冶炼+高端带箔材深加工”产业集群。烟台市重点发展轨道交通装备、新能源汽车、高技术船舶、航空航天装备、能源装备等行业用高性能铝合金材料，加快发展铝合金汽车及零部件、轨道车辆车体模块、铝合金船舶、铝合金结构工程、铝合金建筑模板等产品；重点发展金银等伴生铜冶炼、特种铜合金棒线材、高端铜铸锻件，及军工、航天、高铁、核电用特种铜合金材料及结构件，打造“伴生铜冶炼+特种棒线材深加工”铜产业集群；重点发展金丝、金盐、高端黄金饰品等黄金精深加工产品，大力拓展工业应用领域，加快推进黄金新材料产业化步伐。潍坊市重点发展节能门窗、建筑模板、铝制家具、市政用品、轻量车体等中高端铝型材终端产品，提升发展铝加工设备、门窗幕墙、胶体材料、玻璃、挤压模具、粉末涂料和专业化车体配套产业。东营市重点发展输配电、装备制造、新能源、五金、制冷空调等铜器件终端产品，打造“协同冶炼+消费终端产品”产业集群。枣庄市重点发展不锈钢制品、不锈钢线材、铜帘线、合金铜丝、精密铜线、高端铝材、节能建材等金属产品。

平板玻璃。淄博市、德州市重点发展光伏、光热用超白压花玻璃、屏显基板玻璃。威海市重点发展在线 Low-E（低辐射）玻璃和 TCO（透明导电氧化物镀膜）玻璃。青岛市、枣庄市重点发展汽车玻璃、航空玻璃、轨道交通用玻璃、高端工艺玻璃，高标准打造玻璃贸易专业市场。

水泥。济南市、淄博市、枣庄市、烟台市、潍坊市、泰安市、临沂市重点发展高品质、高耐久水泥和混凝土，积极发展高速、高铁、海洋、核电、隧道等工程用特种水泥，加快发展水泥制品、装配式建筑部品部件等产业，打造以水泥熟料企业为基础，涵盖水泥、骨料、机制砂、混凝土、水泥制品的全产业链。

轮胎。烟台市、青岛市、威海市、东营市、济宁市积极拓展高端产品市场，大力发展宽断面、扁平化、低滚阻、低噪音、缺气保用等高端轮胎产品，开发新型环保、节能的轮胎翻新技术，推动废旧轮胎循环利用产业化、绿色化。青岛市、潍坊市加大炼胶、成型、硫化、模具、检测等轮胎制造装备的研发力度，大力开发轮胎智能制造装备。潍坊市、威海市开发新型结构钢帘线和高模量、低收缩涤纶帘子布等轮胎骨架材料，推动轮胎轻量化发展。淄博市、烟台市、滨州市、青岛市加快溶聚丁苯橡胶、异戊橡胶、稀土顺丁橡胶、卤化丁基橡胶、化学炼胶新材料等新型橡胶品种产业化进程，提高高品质合成橡胶质量。聊城市、菏泽市、德州市加快促进剂、防老剂、防焦剂、炭黑等新型环保助剂的研发与推广，推动橡胶助剂产业高端化、绿色化发展。

纺织服装。青岛市、淄博市、潍坊市、济宁市、烟台市、威海市、泰安市、滨州市、德州市重点布局高端棉纺、差别化功能化纤维材料、高端毛纺面料、高端色织面料和西服服装、时尚女装、童装、休闲装、针织服装等服装服饰产业发展。潍坊市、滨州市、威海市、烟台市、聊城市重点发展床上用品、窗帘、高端巾被、地毯等家用纺织品。济南市、东营市、德州市、泰安市、滨州市重点发展高端绸网、高端非织造材料、高端土工材料等产业用纺织品。

食品。潍坊市、济宁市、德州市、聊城市、滨州市、临沂市、菏泽市加大小麦、玉米等粮食多层次深加工力度，拉长产业链条，提高综合利用水平，提升品牌知名度和市场竞争力。青岛市、烟台市、潍坊市、济宁市、临沂市、德州市、聊城市、滨州市重点发展猪、牛、鸡、鸭等畜禽屠宰及肉类加工产业，提高冷鲜肉和低温肉制品、肉禽调理食品、熟肉制品等精深加工产品比重，强化副产品综合利用能力，提升养殖、屠宰、加工的机械化、自动化、智能化和检验检疫水平。烟台市、潍坊市、临沂市、聊城市、菏泽市依托花生主产区资源优势，培育花生油特色产业群。日照市、临沂市依托临港大豆原料进口优势，培育大豆油特色产业群。滨州市依托玉米油生产产业集聚优势，培育玉米油特色产业群。济南市、青岛市、潍坊市、泰安市建设优质奶源基地，适当压缩常温奶，重点发展巴氏杀菌乳、低温酸乳等产品，推进液态乳制品和干乳制品生产，积极发展奶酪、炼乳、婴幼儿配方乳粉等高附加值产品，做大做强乳业品牌。青岛市、烟台市、威海市、日照市重点发展海珍品、鱼糜制品、海带食品、海产品罐头、海洋生物制品等精深加工产品，加大鱼类、藻类、贝类等海产品综合开发利用，打造海洋食品自主品牌。枣庄市、潍坊市、烟台市、临沂市、济宁市、德州市重点发展低温保鲜果蔬产品、冷冻果蔬产品、脱水果蔬产品和各类果蔬汁、谷物饮料、植物蛋白饮料、茶饮料等，积极开发低热量饮料、营养保健饮料等新产品，提高精深加工水平和产品质量档次。济南市、淄博市、潍坊市、济宁市、泰安市、临沂市、德州市、菏泽市深耕白酒基酒酿造及贮存、成品酒勾调灌装等基础产业，加快向原料基地、酿酒装备、品牌推广、包装容器、物流运输等上、下游配套产业延伸，增强鲁酒品牌竞争力。烟台市、青岛市重点培育集种植、生产、营销、休闲旅游和文化推广为一体的葡萄酒综合体企业，打造世界高端葡萄酒产区。青岛市重点围绕啤酒主业丰富产品结构，研发生产啤酒蒸馏酒、健康饮料等新产品，引领中高端细分市场、扩大海外市场，大力发展工业旅游、连锁餐饮等服务业态。

家电。青岛市重点加强人机智能交互、智能互联、产品自我学习等技术研发，加快发展智能家电、智能安防、智能卫浴、智能康养等产品和场景解决方案。潍坊市重点发展智能音响、智能穿戴设备等新型智能家电。烟台市重点壮大消费电子制造和配套产业规模。济南市重点提升厨电、小家电、洗涤电器的工业设计和研发创新能力，大力发展优质、精致、健康型家电产品。

造纸。日照市重点发展高档化学木浆、溶解浆等产品，提高纸浆自主供应保障能力。淄博市重点发展高档涂布白卡纸、高档装饰原纸、表层耐磨纸、无纺壁纸原纸等高附加值纸制品。东营市、济宁市重点发展高档文化纸、新闻纸、铜版纸、高档涂布包装纸板、高档生活用纸、高档牛皮箱板纸等高端产品。潍坊市、泰安市重点发展高档生活用纸、白卡纸、高级瓦楞纸、高档箱板纸等产品，加快布局植物纤维过滤吸附复合材料、代塑纸等纸基功能材料。枣庄市重

(35) Accelerate the cultivation and expansion of emerging industries. Adhering to the principle of "cultivating and strengthening core capabilities and expanding the total scale", based on major technological breakthroughs and major development needs, we will concentrate on the development of a new generation of information technology, high-end equipment, new materials, modern medicine and other emerging industries, with the output value of emerging manufacturing accounting for more than 40%, and the added value of the "four new" economies in manufacturing accounting for more than <>%, cultivating and forming the main force of new kinetic energy.

1. New generation of information technology. Consolidate and enhance the competitiveness of high-performance servers, smart wearable devices, application electronics, high-end software and other products, and actively cultivate key industrial chains such as integrated circuits, smart sensors, ultra-high-definition video, high-end software, artificial intelligence, virtual reality, information and communication equipment, cloud computing and big data, and blockchain. By 2025, the output value of the information technology industry will reach 1.4 trillion yuan, and 5-8 national-level information technology industry agglomeration areas will be built at a high level.

(1) Integrated circuits. Expand and strengthen the EDA (Electronic Design Automation) industry, focus on the development of high-end memory chips, digital audio and video processing chips, thermal imaging chips, FPGA (Field Programmable Gate Array) chips, information security and laser chips and other products, and actively develop various power electronic chips and sensor chips. Vigorously develop IGBT (insulated-gate bipolar transistor), MEMS (microelectromechanical system) and other characteristic processes, and promote the R&D, design and industrialization of embedded CPUs (central processing units), memories, intelligent computing chips, etc. Accelerate the implementation of localized adaptation and replacement of core devices such as CPUs. Support the R&D and application of key materials such as large silicon wafers, silicon carbide, gallium nitride, photoresists, and high-purity targets, and promote the leap of bonding wires, packaging substrates, conductive adhesives and other materials to the high-end. By 2025, the output value of the integrated circuit industry will exceed 350 billion yuan.

(2) High-end software. Deeply implement the strategy of "two cities with multiple parks, 100 enterprises and 1000,2025 famous products", promote the upgrading of the two Chinese software cities of Jinan and Qingdao, and promote the provincial software parks with conditions to strive to become China's famous software parks. Accelerate the establishment of software and hardware general R&D adaptation platforms and verification and testing environments, guide enterprises to participate in the construction of Hongmeng, Loongson, Feiteng and other ecosystems, as well as open source projects and open source communities, and build more than 8000 provincial software engineering technology centers. Facing key areas such as key basic software, high-end industrial software, emerging platform software, industry application software, and embedded software, accelerate breakthroughs in key technologies such as cloud operating systems, databases, middleware, information security, three-dimensional design simulation, and building information modeling, and cultivate more than <> provincial first-edition high-end software products. By <>, the revenue of software business will exceed <> billion yuan, becoming a leading and world-renowned software industry base in China.

(3) Information and communication equipment. Promote the research of key 5G core technologies such as communication modules, optical components, systems and applications, accelerate the development of 5G RF front-end modules, filters, power amplifiers, tunable lasers and other core devices, and actively carry out 6G-related research and development. Focusing on the development of the industrial Internet, promote the research and development of industrial computing equipment, control equipment, embedded equipment, communication equipment, as well as edge interfaces, industrial operating systems and other software and hardware systems, and develop complete sets of

industrial Internet equipment and system integration. By 2025, the output value of the information and communication equipment industry will reach 350 billion yuan.

(4) Intelligent sensors. Focus on the development of intelligent sensor products in the fields of acoustics, pressure, gas, temperature, infrared, biomedicine, etc., strive to break through key technologies such as chip design, packaging and testing, and system integration, make up for the shortcomings of key basic materials, strengthen the support of advanced technology and intelligent equipment, and improve the stability, reliability and accuracy of sensors. Accelerate the application of smart sensors in key areas such as consumer electronics, automotive electronics, industrial control, medical electronics, aerospace, artificial intelligence, and smart home appliances. By 2025, the output value of the intelligent sensor industry will exceed 500 billion yuan, build the world's leading <>-billion-level integrated sensor production base, and create a new highland of high-end uncooled infrared characteristic chip industry with regional advantages.

(5) Ultra-high-definition video. With Jinan, Qingdao, Yantai and other cities as the core, and cities along the Jiaoji Railway as the focus, accelerate the construction of an ultra-high-definition video industry pattern of "three-core leadership, multi-point linkage, and coordinated development". Focus on basic materials, core components, transmission equipment, special terminals and other fields, promote the development and mass production of SoC core chips and new display devices, and improve the R&D and production capacity of ultra-high-definition TVs. Led by the manufacturing of ultra-high-definition video equipment and terminal products, we will build innovative carriers with high standards, accelerate the creation of a number of "specialized, specialized and new" small and medium-sized enterprises, and support the construction of an ultra-high-definition video industry chain covering equipment production, content collection, production, transmission, presentation, application and other links. By 2025, the output value of the ultra-high-definition video industry will exceed 3800 billion yuan, becoming one of the most important ultra-high-definition terminal production bases in China.

(6) Cloud computing and big data. Accelerate the R&D and industrialization of core cloud computing basic software and hardware equipment, optimize the layout of cloud computing infrastructure, actively develop cloud services such as IaaS (infrastructure as a service), PaaS (platform as a service), and SaaS (software as a service), and promote cloud computing service models. With big data collection, cleaning, transmission, storage, mining, analysis, trading, application and security as the key direction, promote the research and development and industrialization of key technologies, accelerate data aggregation and application, interconnection, and innovate technical service models. Build a national demonstration base for new industrialization of big data in Jinan with high standards, and accelerate the construction of the Jinan Data Science Center. Accelerate the establishment of a data security protection system, strengthen technical prevention, strictly manage security, and effectively improve anti-attack, anti-tampering, anti-virus, anti-paralysis, and anti-theft capabilities. By 2025, the output value of the big data industry will reach 3000 billion yuan, and a data element system with a complete industrial system, sound standards and norms, strong security guarantees, and wide integration and application will be basically formed.

(7) Artificial intelligence. Break through a number of key artificial intelligence products, and create advantageous products and industrial clusters with Shandong characteristics in intelligent computing equipment, intelligent robots, intelligent equipment, video image recognition systems, intelligent chips, intelligent sensors, intelligent software and terminal products. Promote the construction of a number of public service platforms such as open data, supercomputing, open source common technologies, and standard testing and evaluation. Guided by the construction of the Jinan-Qingdao Artificial Intelligence Innovation and Application Pilot Zone, explore and create a "Jinan-Qingdao integration" development model, and promote the deep integration and application of artificial intelligence with advantageous industries such as intelligent manufacturing, smart healthcare, smart home, and intelligent rail transit. By

2025, the artificial intelligence industry ecological chain led by Jinan, Qingdao and other cities will initially take shape, and the output value of artificial intelligence core industries in the Jinan-Qingdao Artificial Intelligence Innovation and Application Pilot Zone will reach 300 billion yuan, building an important artificial intelligence industry cluster in China.

(8) Virtual reality. Focus on the industrial layout of "precision components + intelligent hardware complete machine", strengthen key technology research such as industrial digital twin and three-dimensional reconstruction, and accelerate the construction of independent and controllable VR/AR tool chain. Cultivate the industrial data ecosystem under the "VR/AR+ smart industry" model, accelerate the construction of virtual reality industry application technology R&D centers in Jinan and Qingdao, and promote the large-scale application of VR/AR technology in industrial design, manufacturing, maintenance and safety training. By 2025, more than 80 typical virtual reality application development scenarios will be created, and the output value of VR/AR industry will exceed 400 billion yuan, maintaining a leading edge in the country.

(9) Blockchain. Relying on information technology industry agglomeration areas such as Jinan, Qingdao, and Yantai, around key links such as platform construction, data services, and security evaluation, we will introduce and cultivate a number of backbone enterprises to build 3-5 blockchain characteristic industrial parks. Build R&D carriers such as the Blockchain Research Institute, the Key Laboratory of Blockchain Finance, and the Encore Blockchain Industry Development Research Institute, and accelerate breakthroughs in key common technologies such as distributed storage and cryptography. Led by the construction of the "Spark Chain Network" Jinan super node, promote the integration of blockchain underlying services on the industrial Internet platform to achieve mutual trust sharing and value enhancement of industrial data. Carry out in-depth "chain +" actions, promote the implementation of a number of key projects in key areas such as product traceability, government affairs and people's livelihood, financial services, health care, and smart transportation, and build more than 10 influential blockchain industry application platforms. By 2025, build a blockchain technology innovation highland, industrial gathering place and integrated application pilot zone with national influence.

专栏 3 新一代信息技术产业布局
<p>集成电路。济南市重点围绕高性能集成电路、功率器件、智能传感器、第三代半导体等细分领域，完善材料、设计、制造、封测等产业环节，壮大产业规模。青岛市重点发展专用芯片设计、晶圆制造、系统级封装等产业。烟台市重点发展键合丝、封装基板、MEMS 传感器、半导体化学材料、红外探测器产品设计和、特色半导体封测等产业。淄博市重点发展 MEMS 传感器、晶圆级封装、引线框架材料、第三代半导体等产品。潍坊市、威海市、日照市重点发展智能传感器、功率半导体封测、光刻胶等产业。德州市重点发展集成电路用硅片生产。济宁市重点发展半导体分立器件、功率器件及功能芯片、第三代半导体。滨州市重点发展半导体分立器件生产和制造。枣庄市重点发展硅基辐射探测器芯片产品、高端磁性材料产品等。</p> <p>高端软件。济南市、青岛市重点发展操作系统、中间件、工业软件、数据库、信息安全软件、工业 APP、工业互联网平台、人工智能应用与服务、区块链等技术和产业。烟台市重点巩固提升行业应用软件水平，在商品溯源、供应链金融、电子票据等领域开展区块链布局。潍坊市重点发展网络安全、地理信息、电子商务、工业大数据等产业。济宁市、聊城市重点发展高端电力行业软件、北斗及车联网、智慧交通、智慧健康等产品及应用。东营市重点巩固提升石油行业软件开发应用水平。泰安市重点发展办公软件、智慧政务等产业。威海市重点发展信息系统集成服务、商用密码、智能温控等产业。日照市重点发展机器人控制系统、智能消防平台、网络教育、智能配送等产业。临沂市重点发展“智慧教育”“智慧物流”等行业应用软件和系统。滨州市重点发展智慧物业、智慧社区、大数据、工业互联网等技术和产品。</p> <p>智能传感器。济南市重点提升 MEMS 传感器及模组封装技术，形成规模化封装测试代工能力，推动形成特色产业聚集区。青岛市依托微电子研究院，进一步集聚全球研发人才，推动建设总部级研发中心，打造国内领先的声学智能传感谷。淄博市依托传感器研究院，建设集 MEMS 芯片设计研发、工艺加工、封装测试、产品应用和配套服务等为一体的综合性研发产业基地。烟台市打造光电智能传感产业基地，建设面向全国的行业公共服务平台，提升研发和中试服务能力。潍坊市重点发展智能穿戴设备、人机交互控制终端、触摸屏控制系统、微型扬声器模组等技术和产品，打造国家级声学产业基地。威海市加快培育智能器件封测等项目，重点建设智能传感器封测生产线。</p> <p>计算机及外设。济南市重点提升服务器、微机及配套软件的创新力，打造中国算谷、超算中心等产业创新载体，壮大数字经济规模。烟台市重点培育信创产业，培育特色优势计算机产业集群。威海市重点强化激光打印机产业，打造全国领先的打印机制造产业基地。</p> <p>人工智能。济南市重点发展智能服务机器人、图像识别、无人驾驶等前端产业。青岛市重点发展智慧城市、医疗影像辅助诊疗、智能家居等产业。潍坊市重点布局虚拟现实、智能穿戴、智能音响、自然语言处理、无人机和机器人等新型产业。烟台市重点发展多关节机器人、康复医疗系统、智能感知等产业，威海市重点发展壮大 3D 打印机、智能电子、智能终端等产业。</p> <p>超高清视频。济南市建设“黄河流域超高清视频产业发展隆起带”，打造新型“5G+超高清视频”产业创新发展基地，推动 5G+4K/8K 技术在重点行业领域的推广应用，强化 4K/8K 超高清电视节目制作能力。青岛市建设“一带四核”超高清视频产业高地，培育壮大一批全球领先的龙头企业，推动超高清 8K 显示画质处理芯片开发及产业化等重点项目建设，加快提升 4K/8K 电视机生产能力，扩大 4K/8K 电视市场占有率。烟台市建设超高清视频产品研发制造基地，强化超高清摄录设备、显示终端、高端新型显示材料、关键零部件等研发生产能力。</p>

2. High-end equipment. Focus on the development of new energy vehicles, marine engineering equipment and high-tech ships, rail transit equipment, high-end construction machinery, intelligent agricultural equipment, high-end CNC machine tools and robots, energy equipment, environmental protection equipment, breakthrough development of power equipment, hydrogen fuel cells, hydraulic systems, bearings and other core basic components. By 2025, the output value of the equipment industry will reach 2.5 trillion yuan, and the scale of high-end equipment manufacturing industry will account for more than 50% of the equipment industry, and build a first-class and world-renowned high-end equipment manufacturing base in China.

(1) Automobiles and parts. Break through the key core technologies of commercial vehicles, accelerate the development of high-end, intelligent and green, and build a world-class commercial vehicle R&D and production base. With new energy vehicles and intelligent networked vehicles as the main direction, improve the level of system integration and industrial design of passenger cars, and vigorously develop medium and high-end passenger vehicles. Strengthen R&D and innovation of key core technologies, strive to maintain the world's leading level of high-thermal efficiency commercial diesel engine technology, and accelerate breakthroughs in new energy vehicle technologies such as high-safety power batteries, high-efficiency drive motors, and high-performance power systems, as well as intelligent networked vehicle technologies such as basic technology platforms, intelligent terminals, autonomous driving, and virtual simulation. Vigorously develop powertrains, automatic transmissions, electronic control systems, sensors, control systems, automotive-grade IGBTs, core chips and other parts and components to improve the supporting capabilities of the industrial chain. By 2025, the key equipment of automobile manufacturers will reach the international advanced level, the performance of vehicle energy saving, environmental protection and safety will reach

the domestic leading level, and the proportion of systematization, modularization and integration of auto parts and product quality standards will be significantly improved; The output value of the automobile industry exceeds 1 trillion yuan, and the production scale of finished vehicles in Shandong reaches about 300 million units, striving to maintain the top three in the country.

(2) Agricultural machinery equipment. Focus on the development of intelligent high-horsepower tractors, high-speed precision seeders, high-speed planters, large-scale land preparation machines, high-efficiency harvesters, intelligent cotton pickers and other high-end agricultural machinery products, accelerate the promotion of hydraulic transmission, electro-hydraulic suspension and intelligent control and other key technology research and development and industrialization, and promote the development of agricultural machinery equipment to large-scale, high-end, intelligent, integrated and multi-functional. Accurately dock with the grain, oil and food processing industry, and promote the research and development and industrialization of advanced equipment. By 2025, large-scale agricultural machinery equipment will basically realize real-time diagnosis, remote monitoring and automatic control of fault and operational performance, the level of intelligence will reach international advanced, the output value of agricultural machinery industry will reach 1000 billion yuan, and the status of the largest province of agricultural machinery will be further consolidated.

(3) Construction machinery. Accelerate breakthroughs in key technologies such as high-end engines, hydraulic systems, and electronic control systems, and focus on the development of bulldozers, excavators, loaders, TBMs, engineering vehicles and other complete products with green, lightweight, large-scale and diversified functions, and continuously improve the reliability, stability, durability and safety of products. Integrate the application of satellite positioning, digital transmission, intelligent control, remote monitoring and other technologies to realize automatic remote positioning, monitoring, detection, diagnosis, forecasting, maintenance, management and other intelligent control of products. By 2025, the technical level of large-scale intelligent construction machinery will reach the international advanced, and the output value of the construction machinery industry will exceed 1500 billion yuan, striving to rank among the top three in the country.

(4) CNC machine tools and robots. Accelerate breakthroughs in key functional components and machine design and manufacturing, precision improvement and reliability technology, focus on the development of CNC rotary tables, servo tool holders, mechanical double swing angle milling heads, high-power electric spindles, high-speed heavy-duty lead screw (guide rail) pairs and other functional components, as well as precision grade CNC lathes, precision cylindrical (vertical) grinders, vertical (horizontal) machining centers, turn-mill composite machining centers, five-axis linkage machining centers and other metal cutting machine tools, large servo presses, laser cutting machines and other metal forming machine tools, Additive manufacturing technology and additive and subtractive composite machine tools enhance the technical advantages of automatic production lines for automotive cover parts. Vigorously develop servo systems, controllers, reducers and other core components of robots, and promote the development and application of multi-joint robots, SCARA (horizontal multi-joint) robots, coordinate robots, AGVs (factory logistics and warehousing robots) and intelligent equipment systems with industrial robots as the core. By 2025, the output value of machine tools and robots will reach 400 billion yuan.

(5) Ships and offshore equipment. Promote the low-carbon and energy-saving transformation and upgrading of the three main ship types of bulk carriers, container ships and oil tankers, and focus on the development of ultra-large oil tankers, ultra-large bulk carriers, large gas carriers, medium and large container ships, high-end passenger ro-ro ships, high-end ocean-going fishing vessels, green intelligent inland river vessels, sport fishing yachts, river-sea direct ships and other high-end ship types; Develop special ships such as large and medium-sized engineering ships and high-performance law enforcement ships; Breakthrough in the key technology of design and construction of

characteristic cruise ships. Improve the capacity of deep-sea oil and gas equipment, focusing on the development of deepwater and ultra-deepwater semi-submersible production platforms, floating production storage and offloading units (FPSOs), and liquefied natural gas floating production storage and offloading units (FLNGs); Cultivate and expand new marine engineering equipment, focusing on the development of high-end products such as integrated installation and dismantling equipment for large-scale marine facilities, ultra-large multi-purpose self-propelled platforms (large navigation islands) at sea, offshore urban complexes, offshore wind power integrated installation platforms, offshore floating nuclear power plant platforms, desalination equipment, offshore hydrogen production equipment, and maritime space launch equipment; Accelerate the development of deep-sea fishery aquaculture equipment such as large-scale deep-sea intelligent cages and large-scale aquaculture vessels. By 2025, the industrial chain of ship and offshore equipment R&D and design, assembly construction, product supporting, inspection and certification, and demonstration application will be further improved, and the industrial output value will exceed 700 billion yuan, ranking among the top three in the country and becoming the world's leading marine engineering equipment base.

(6) Rail transit equipment. Focus on the development of high-speed grade Chinese standard EMUs, genealogized Chinese standard subway trains, high-speed maglev vehicles and other new-generation vehicles, promote the industrialization of high-end devices such as new high-efficiency silicon carbide converters, traction transmission systems, braking systems, high-performance bogies, high-speed maglev core devices and systems, and build a world-class rail transit equipment industrial cluster. By 2025, the output value of rail transit equipment industry will reach 1200 billion yuan.

(7) Energy equipment. Accelerate the development of new offshore wind power equipment facing COSCO and suitable for the characteristics of offshore wind farm resources in our province, build an offshore wind power industry chain integrating complete machine manufacturing, key supporting facilities, installation and construction, inspection and testing, and operation and maintenance services, and explore the development of comprehensive development equipment for offshore wind power and hydrogen, fishery, seawater desalination and photovoltaics. Vigorously develop marine renewable resources development equipment such as wave energy/tidal energy power generation and temperature difference energy power generation. Relying on the construction of nuclear power bases in our province, we will optimize and strengthen key supporting equipment such as instrument and control equipment, ring forgings, flange valves, nuclear power main pipelines, pressure vessels, nuclear-grade cables, and small nuclear reactors, actively cultivate comprehensive utilization equipment for nuclear energy, and promote the introduction of a number of high-end nuclear power equipment manufacturing projects. Vigorously develop solar thermal, photoelectric manufacturing and supporting industries, focus on high-efficiency crystalline silicon cells, heterojunction cells, flexible thin-film solar cells, a new generation of photovoltaic inverter systems, and improve the manufacturing capacity of photovoltaic power generation equipment. Actively develop the energy storage equipment industry, focusing on key technologies and products such as large-capacity lithium battery management, wireless interconnection of high-power converters, and positive and negative electrode materials for energy storage batteries. Focusing on the manufacturing of high-end equipment such as ultra-deep well oil and gas exploitation and large-scale comprehensive coal mining equipment, the advantages of high-end equipment manufacturing for oil and gas and coal mining will be further improved. By 2025, the output value of the offshore wind power industry chain will reach 500 billion yuan.

(8) Hydrogen energy and fuel cells. Vigorously develop hydrogen purification technology, gradually reduce the cost of hydrogen production, and improve the utilization rate of industrial by-product hydrogen. Lay out and build a large-scale production base for fuel cells and power systems, accelerate the development of high-specific power and high-safety hydrogen fuel cells, accelerate the preparation of key materials and core components of fuel cells, system integration and intelligent control, a new generation of energy-efficient hydrogen production, storage and

transportation and new proton exchange membrane fuel cell systems and other technologies, promote the industrialization of fuel cell core materials, key components and power systems, and promote the development of hydrogen energy application industries such as fuel cell vehicles, rail transit, and ships. Taking the implementation of the "hydrogen into 2025, 1000 homes" project as an opportunity, relying on the National Fuel Cell Technology Innovation Center, giving full play to the advantages of the whole industrial chain, and actively building a national hydrogen energy and fuel cell industry base integrating innovative research and development, equipment manufacturing, product application and commercial operation. By 2025, the output value of hydrogen energy and fuel cell industry will exceed 300 billion yuan.

(9) Environmental protection equipment. Focusing on the hot and difficult problems of environmental pollution that need to be solved urgently and the needs of continuously improving environmental protection standards, vigorously develop air treatment equipment, water treatment equipment, soil pollution control equipment, solid waste resource utilization and disposal equipment, marine environmental protection equipment, noise and vibration control equipment, low-carbon development equipment, special equipment for environmental monitoring, environmental pollution emergency treatment equipment, environmental protection materials and pharmaceuticals and other key areas. Cultivate a group of leading enterprises in environmental protection equipment manufacturing with important influence, develop a number of intelligent, energy-saving advanced and efficient environmental protection equipment, and realize the high-end development of environmental protection equipment manufacturing with characteristic advantages. By 2025, the output value of environmental protection equipment will reach 300 billion yuan, and its R&D and service capabilities will rank first in the country.

汽车及零部件。济南市重点发展重卡、轻卡、皮卡、客车、新能源汽车等整车，以及车桥、变速箱等关键零部件。青岛市重点发展乘用车、商用车、新能源汽车等整车。潍坊市重点发展新能源汽车、轻卡等整车，以及发动机、变速器、液压、新能源动力系统总成等产品。淄博市重点发展乘用车整车、新能源汽车整车。烟台市重点发展乘用车、新能源汽车、轻卡等整车，以及燃油喷射系统、车用空调冷却器等核心零部件。聊城市重点发展新能源汽车、智能网联汽车、VAN类客车等。东营市、德州市、滨州市重点发展轮胎、传感器、刹车片、活塞、轮毂等零配件产业。临沂市重点发展半挂车、厢式车等运输专用车，以及车桥、减震、制动器等关键核心零部件。济宁市重点发展重型卡车，运输类半挂车，加快发展特种作业类、市政环卫类、工程类等技术含量高、附加值高的专用车。枣庄市重点发展运输类半挂车，加快发展配套的气压盘式制动器。滨州市重点发展轻量化铝新材料车身，轻量化（罐式和厢式）运输半挂专用车（低风阻列车）、车（船）用专用活塞、高档轮毂、高端刹车片等。

工程机械。济宁市、临沂市、聊城市重点发展装载机、挖掘机、铲土运输机、工程起重机、工程车辆、压实机械、路面施工与养护机械、混凝土机械、桩工机械、叉车等整机产业，以及四轮一带、轴承等关键零部件。潍坊市、烟台市重点发展装载机、挖掘机等机械及动力系统、液压传动等产品。济南市重点发展高空作业机械、矿山机械和混凝土搅拌机械。滨州市重点发展水陆两用挖掘机及挖泥船等专用工程机械。枣庄市重点发展绿色高效智能矿山机械、小型特种工程机械、电动工程机械。

农机装备。潍坊市重点发展拖拉机、谷物联合收获机、玉米收获机、打捆机、粮食烘干机等整机产品，以及发动机、车桥、传动系统等配套产品。济宁市重点发展玉米收获机、播种机等特色农机装备。聊城市、日照市重点发展拖拉机、青饲料收获机等装备。临沂市重点发展园林植保机械、多功能联合收获机械、液压传动系统等产品。

数控机床。济南市重点发展机械压力机、伺服压力机、激光切割机、汽车覆盖件自动生产线、精密立（卧）式加工中心、精密车铣复合加工中心、数控龙门五轴联动加工中心、精密外圆磨床、工业机器人、自动化柔性装配生产线等产品，突破五轴联动双摆角镜头头核心技术。青岛市重点发展工业机器人和以机器人为核心的智能制造成套设备。枣庄市重点发展高档数控机床产业集群，重点发展精密立（卧）式加工中心、精密车铣复合加工中心、精密五轴联动加工中心等数控机床产品。烟台市重点发展精密数控回转工作台、精密伺服刀架等高端数控机床床功能部件。济宁市重点发展高速重载丝杠副（导轨副）、大功率电主轴、数控刀具等关键零部件和高档数控加工中心等产品。德州市重点发展重型卧式数控车床、数控深孔钻镗床等产品。威海市重点发展精密立式（卧式）加工中心、精密外圆（立式）磨床、机械压力机等产品。滨州市重点发展汽车零部件等专用机床。

船舶与海工装备。青岛市、烟台市、威海市重点发展船舶与各类新型海工装备整机制造。潍坊市、淄博市重点发展海洋动力装备。东营市重点发展海洋石油装备。济南市、青岛市、潍坊市、淄博市、泰安市、德州市、滨州市大力发展船舶和海工配套装备。济宁市重点发展内河船舶。

轨道交通装备。青岛市重点发展高速动车组、城轨地铁车辆等整车制造产业，以及牵引系统、制动系统、网控系统、减震系统等配套产业。济南市重点发展先进轨道货车、轨道交通工程机械产品。烟台市重点发展轨道交通整车车体型材制造产业。东营市重点发展高铁车轮、车轴、轮对等配套产品。济宁市重点发展制动盘等配套产品。潍坊市重点发展以牵引变压器为主的智能轨道交通“四电集成”产业。滨州市重点发展高速重载新材料钢轨、高铁车体及国产化高端轴承材料、精密铸件、基建桥隧物资装备制造及服务产业。枣庄市重点发展轨道胶轮牵引车、隧道清洗车、轨道铣磨车等专用车辆。

能源装备。以烟台市、威海市、东营市、滨州市为重点，打造北方重要的海上风电装备产业基地。以济南市、烟台市、威海市为重点，培育一批核电装备产业园。以济南市、淄博市、济宁市为重点，培育光伏产业集群；以济南市、枣庄市、德州市为重点，培育光热产业集群。枣庄市重点发展动力电池锂离子电池隔膜、正极材料、负极材料、智能化锂离子电池、半固态锂离子电池，打造全国重要的锂电生产基地。

环保装备。济南市、淄博市、济宁市、聊城市重点发展 VOCs 治理、烟气脱硫脱硝除尘技术装备，工业固废处理、生物净化、油气回收成套技术装备。青岛市、威海市重点发展船舶废水废气处理成套技术设备及海水淡化技术装备，环境监测专用仪器仪表、智能化监测技术装备等。枣庄市重点发展碳捕集、利用与封存技术装备等。东营市重点发展工业废水、污泥高效处理技术装备，海上风电等清洁能源技术装备等。烟台市重点发展 VOCs 治理及净化回收一体化技术装备，工业固废循环利用技术装备，土壤及地下水修复技术装备等。潍坊市重点发展工业固废循环利用技术装备。泰安市重点发展 VOCs 监测检测、烟尘烟气水质监测技术装备等。日照市重点发展烧结机烟气循环利用技术装备、废钢预热技术装备等。临沂市重点发展废旧电器智能化拆解装备、餐厨垃圾成套处理技术装备等。德州市重点发展过滤成套技术装备，生活垃圾和建筑垃圾处理处置成套技术装备等。

3. New materials. Focusing on the three major directions of advanced basic materials, key strategic materials and cutting-edge new materials, promote the extension of basic materials such as chemicals, steel, nonferrous metals, and building materials to new materials, focus on the development of key strategic materials such as high-performance fibers and composite materials, advanced ceramics, and rare earth functional materials, and break through the development of cutting-edge new materials such as graphene, 3D printing, ultra-high temperature, and intelligent bionics. By 2025, the output value of the new material industry will exceed 1 trillion yuan, becoming an important new material research and development and industrialization highland in China.

(1) Advanced steel materials. In order to meet the demand for special steel for major projects and high-end equipment manufacturing, we will focus on the development of high-performance offshore steel, ultra-high strength

and toughness automotive steel, high-grade automotive gear steel, high-performance rail transit steel, super ferritic stainless steel, high nitrogen austenitic stainless steel, super duplex steel, advanced prefabricated construction steel and other advanced steel materials. Improve the level and capacity of metal powder milling, develop new powder metallurgy parts preparation technology, and improve the proportion of high-tech content and high value-added products such as automobile structural parts. By 2025, the output value of the advanced steel materials industry will reach 3000 billion yuan.

(2) Advanced non-ferrous metal materials. Give full play to the basic advantages of aluminum, copper and other industries, enhance innovation capabilities, and extend the industrial chain. Focus on the development of high-strength and high-toughness aluminum alloy, high-strength heat-resistant aluminum alloy, new aluminum alloy composite materials and other products, and develop high-end products such as high-strength and high-conductivity copper alloy, corrosion-resistant copper alloy pipe, and high-purity rolled copper foil. Vigorously develop high-performance magnesium alloy materials used in automobiles, rail transit, electronics and other fields. Improve the product level of rare earth functional materials, and accelerate the development of rare earth permanent magnet materials, catalytic materials, phosphors, high-performance hydrogen storage materials and other functional materials with high consistency, good stability and strong applicability. By 2025, the output value of advanced non-ferrous metal materials industry will reach 3000 billion yuan.

(3) Advanced polymer materials. Focus on the development of polyolefin elastomers, high-performance resins, special rubbers, special plastics, high-performance film materials, fluorosilicon materials, high-end special chemicals, high-end daily chemicals and other new material products, accelerate the branding, greening, high-end development, consolidate and enhance the leading edge. By 2025, the output value of the advanced polymer materials industry will exceed 2600 billion yuan.

(4) Advanced inorganic non-metallic materials. Facing the new generation of information technology industry, aerospace, new energy vehicles, energy conservation and environmental protection and other key fields, focus on the development of ultra-thin liquid crystal glass substrate ceramic materials, high-purity ultra-fine alumina powder and transparent ceramics, silicon carbide ceramics, high-purity silicon nitride (aluminum) powder, special ceramics and composite materials, wide bandgap semiconductor silicon carbide single crystal substrate materials and power devices, gallium nitride crystals, electronic information ceramics and components and other products, support the development of new wall materials, lightweight building materials, new building waterproof materials, Energy-saving and environmentally friendly building materials such as prefabricated buildings. By 2025, the output value of advanced inorganic non-metallic materials industry will reach 800 billion yuan.

(5) High-performance fibers and composite materials. Actively develop low-cost large-scale manufacturing technology of high-performance fibers and composite materials, improve the supporting system of raw materials and accessories, and focus on the development of high-performance and low-cost carbon fibers, high-strength and high-mold and functional glass fibers, aramid, polyimide fibers, ultra-high molecular weight polyethylene fibers, alumina fibers, boron nitride fibers, basalt fibers, silicon carbide ceramic fibers and other high-end fiber products; Improve the intelligent and green manufacturing technology and industrialization level of high-temperature thermoplastic composite materials for high-performance fibers and composite materials; Broaden the application of high-performance fibers and composite materials in industrial equipment, high-pressure gas cylinders, automobile lightweighting, rail transit, wind power generation, marine and sports and leisure. By 2025, the output value of high-performance fiber and composite materials industry will reach 500 billion yuan.

(6) Cutting-edge new materials. Keep up with international frontier trends, strengthen the layout of basic research and intellectual property rights, actively seize the commanding heights of development, and promote breakthroughs in

industrialization in frontier fields. Improve the industrial scale and product stability of basic materials such as graphene powder, and strengthen the development of 5G mobile phone conductive films, graphene energy storage materials, protective coatings, composite materials and other application products. Vigorously develop TPU flexible printing materials, degradable 3D printing materials, 3D printing metal materials and other products to promote the accelerated development of the additive manufacturing industry. Advanced layout of ultra-high temperature materials, intelligent biomimetic materials, shape memory alloys, liquid metals and other cutting-edge materials that are still in their infancy. By 2025, the output value of cutting-edge new materials industry will reach 100 billion yuan.

专栏 5 新材料产业布局
<p>先进高分子材料。烟台市重点发展异氰酸酯、聚酯多元醇、聚酯多元醇、聚烯烃弹性体 (POE)、超高压电缆绝缘料聚乙烯 (XLPE)、高端管材专用 HDPE 等产品，向下游延伸产业链发展聚氨酯深加工产品。淄博市重点发展高性能有机氟、有机硅、环保组合聚醚、特种聚酯、聚酯多元醇、无氟聚氨酯化学发泡剂等产品，重点攻关己二腈生产技术，扩大高温尼龙、透明尼龙、长碳链尼龙生产规模。济南市重点发展长碳链及耐高温尼龙产品。济宁市重点发展长链二元酸等原材料。泰安市重点发展特高压设备用环氧树脂、固化剂、绝缘材料等。</p> <p>先进无机非金属材料。淄博市重点发展氮化硅粉体、连续氮化碳纤维等陶瓷材料，熔融石英陶瓷、陶瓷透波天线罩等结构陶瓷，氧化铝防弹陶瓷板等功能陶瓷。潍坊市巩固提升高技术碳化硅陶瓷材料市场占有率。临沂市重点发展高性能锰锌铁氧体材料、低功耗电磁功能材料、铁基软磁复合材料低频电机定子、合金基软磁复合材料等产品。东营市、烟台市、德州市、济南市重点发展布局电子陶瓷材料、蜂窝陶瓷载体、齿科用氧化锆、熔融石英坩埚、陶瓷过滤板、氮化硅陶瓷微珠、氮化硅电路基板、汽车催化用蜂窝陶瓷、碳化硅单晶衬底、电磁屏蔽材料等特色产品。</p> <p>高性能纤维及复合材料。威海市重点发展碳纤维、经编织物、机织物、预浸料、风电碳梁、航天用复合材料等碳纤维及其复合材料制备。泰安市重点发展耐碱玻纤、高强高模玻纤、低介电玻纤、复合纤维、耐高温玻纤、超细电子纱、工业纱、环保用耐酸细纱等玻纤产品。烟台市重点发展氨纶、间位芳纶、对位芳纶、芳纶纸等高性能纤维产品。临沂市重点发展超高模量玻璃纤维、高强细纱等玻纤防火布、新型玻纤复合管道、管道防腐玻纤方格布等高端深加工玻纤产品。济南市、德州市、东营市、济宁市突出差异化发展，重点在碳纤维复合材料、碳纤维制品和应用等市场需求大、发展前景好的领域布局。</p> <p>稀土功能材料。烟台市大力发展高性能钕铁硼永磁材料等稀土永磁材料、稀土光功能材料。淄博市重点推动稀土催化、抛光、发光、钕铁硼永磁等功能材料产业高端化。济宁市重点发展轻质高强度稀土镁合金、铝合金等稀土金属及合金材料，做大做强稀土储氢材料产业。威海市重点发展稀土永磁材料、稀土金属材料、稀土催化材料及其下游应用，拓展延伸稀土功能材料产业链。滨州市重点发展高端稀土特钢新材料。</p> <p>石墨烯。济南市重点发展高品质新型生物基石墨烯新材料，加快超级活性炭、干法电极等核心技术研发，开发高性能电池正极材料。青岛市重点发展石墨烯锂离子电池和超级电容、防腐涂料、纤维复合材料等石墨烯材料制备。济宁市重点发展石墨烯微片（粉体/浆料）、氧化石墨烯、石墨烯薄膜、电池用石墨烯复合导电剂、石墨烯改性重防腐涂料、石墨烯复合材料等产品。东营市重点发展石墨烯改性材料。滨州市、菏泽市重点发展碳纳米材料、石墨烯及功能材料的研发、生产和应用开发。</p>

4. Modern medicine. Focus on the development of biological drugs, new varieties of chemical drugs, high-quality traditional Chinese medicines, high-performance medical devices, new excipient packaging materials and pharmaceutical equipment, accelerate the pace of research and development and industrialization of original research drugs, first generic drugs, clinical shortage drugs and high-end medical devices, develop new traditional Chinese medicine drugs with precise efficacy and high clinical value, and promote the development of specialized pharmaceutical contract outsourcing service models. By 2025, the output value of the pharmaceutical industry will exceed 4200 billion yuan, ranking among the top two in the country; Strive to build a number of <->-billion-level pharmaceutical industry innovation clusters, and initially build a leading biomedical manufacturing center and an important medical device industry agglomeration area in China.

(1) Biological drugs. Focus on the development of antibody drugs for tumors, neurological diseases, cardiovascular diseases and anti-infectious diseases. Accelerate the research and development of new antibody varieties such as antibody conjugate drugs, bifunctional antibodies, and antibody fusion proteins. For blood and hematopoietic system, viral infection, tumor and other diseases, develop new recombinant protein drugs with low immunogenicity, good stability strong targeting long acting and high bioavailability Promote the efficient utilization of blood products and develop a series of blood products such as human albumin, immunoglobulin, and hepatitis B immunoglobulin. Support the research and development of new vaccines such as multivalent vaccines, genetically engineered vaccines, viral

vector vaccines, and nucleic acid vaccines. By 2025, the output value of the biopharmaceutical industry will reach 400 billion yuan.

(2) Chemical drugs. Closely follow the development of international innovative drugs and the trend of key technology research and development, carry out innovative drug research and development, and develop innovative chemical drugs based on new targets, new types and new mechanisms around the field of major disease prevention and treatment. Breakthrough in industrialization technologies such as drug synthesis, crystallization purification, and dosage form technology, promote new pharmaceutical preparation technologies such as transdermal absorption, mucosal drug delivery, and targeted drug delivery, and improve the industrialization level of original drugs, first generic drugs and new preparations. Consolidate and strengthen the dominant position of bulk API market and the strategic position of the industrial chain. Accelerate the development of new formats and models in the pharmaceutical field, such as contract R&D, contract customized production, and contract customized R&D and production. By 2025, the output value of the chemical pharmaceutical industry will reach 1800 billion yuan, striving to maintain the first place in the country.

(3) Traditional Chinese medicine. Consolidate and strengthen the dominant position of existing large varieties of proprietary Chinese medicines. Carry out in-depth development of classic formulas of traditional Chinese medicines and secondary development of proprietary Chinese medicines, develop new Chinese medicines with compounds, effective parts and active ingredients, and accelerate the research and development and industrialization of innovative Chinese medicine drugs with precise efficacy and high clinical value. Vigorously develop Qilu authentic medicinal materials, and strengthen the industrial belt of Yimeng Mountain, Jiaodong Peninsula, southwest Lu, Nansi Lake and Luzhong Chinese medicinal materials. Encourage Chinese medicine manufacturers to research and develop new Chinese medicine pieces such as Chinese medicine formula granules, and do a good job in the in-depth processing and innovation of Chinese medicine pieces to meet the diversified needs of patients. Accelerate the research and development of Chinese medicine functional foods such as American ginseng, *Ganoderma lucidum*, *eucommia*, rose, and *dendrobium*. By 2025, the output value of the traditional Chinese medicine industry will reach 500 billion yuan.

(4) Medical devices. Aiming at the development direction of precision medicine and personalized medicine, focus on the development of high-end medical equipment and key components such as high-end imaging diagnosis, advanced treatment, precision detection, monitoring and rehabilitation. Strengthen the research of digital diagnosis and treatment equipment, in vitro diagnostic products, high-end medical materials, high-value consumables and other products, achieve technological breakthroughs in precise positioning and navigation of surgery, data collection, processing and analysis, and promote the application of new technologies such as biological three-dimensional printing technology and data chips. Develop implantable interventional products such as fully degradable vascular stents, and promote the quality and upgrading of rehabilitation assistive devices. Promote the industrialization of clinical medical products and build an industrial base for emergency medical protective materials. Strengthen the demonstration application of the first (set) of high-end medical equipment, and encourage and guide hospitals to configure and use large-scale medical equipment of domestic independent brands. By 2025, the output value of the medical device industry will reach 1300 billion yuan.

专栏 6 现代医药产业布局

医药。济南市重点发展基因技术、干细胞与再生医学、抗肿瘤治疗等生物制品及生物药，化学原料药及化学制剂，抗衰老、保健养生等中医药产业。青岛市重点发展海洋生物医药产业。淄博市、济宁市、东营市、潍坊市重点发展医药中间体、化学原料药及化学制剂、药用包材等产业。烟台市重点发展生物药、海洋医药产业。临沂市、菏泽市、潍坊市、聊城市重点发展中药材种（养）殖、中药饮片、中成药等现代中药以及化学原料药、化学制剂产业。

医疗器械。淄博市重点发展感染控制设备、放疗产品、数字化诊断影像等医疗装备，消毒灭菌设备、配药机器人等制药装备产业。威海市、潍坊市重点发展新型生物医用材料及一次性输注、血管支架、人工骨骼等高端耗材产业。济南市重点发展细胞与基因检测、血液分析等体外诊断器械产业。烟台市、潍坊市重点发展涉氧器械、生物医学材料、体外诊断仪器及试剂产业。青岛市重点发展海洋生物医用材料产业。济宁市、泰安市重点发展高智能、高科技康复辅助器具产业。日照市、枣庄市、潍坊市重点发展医用口罩、防护服等医疗防护物资产业。

(4) Plan ahead and lay out future industries. Adhering to the principle of "aiming at the frontier and making key breakthroughs", in the fields of cutting-edge science and technology and industrial transformation such as life sciences, quantum information, flexible electronics, aerospace science and technology, and deep sea and far sea, we plan ahead and lay out a number of future industries, strengthen the multi-path exploration, cross-integration and disruptive technology supply of cutting-edge technologies, create future technology application scenarios, and form new growth points for industrial development.

1. Life Sciences. Actively use modern biotechnologies such as genetic engineering, fermentation engineering, cell engineering, enzyme engineering, molecular breeding and other modern biotechnologies to improve and cultivate animal and plant and microbial traits and varieties, strengthen the research and development and innovation of plant extraction technologies such as Chinese herbal medicines and flowers, and promote the modernization of Chinese medicine. Focus on life sciences, biotechnology-related materials and instruments and equipment, research and development of high-end drug sustained release and targeting materials, medical device compensation materials, gene sequencing and chip technology, cell therapy and gene therapy technology key materials, accelerate the research equipment and equipment required for stem cell application, gene therapy, CAR-T cell therapy, antibody drug treatment and other technology transformation.

2. Flexible electronics. Actively introduce and cultivate flexible electronic equipment manufacturing enterprises and complete machine brand manufacturers, strengthen the research and development of flexible electronic basic theory, key materials, process technology, core equipment and other fields, strive to break through major technologies such as flexible communication, flexible display, flexible medical treatment, flexible sensing, flexible energy, etc., and explore and develop medical health, human-computer interaction, wearable electronics, energy systems, storage computing, information display and other products based on flexible electronic technology.

3. Aerospace Technology. Seize the special implementation opportunities of Beidou global networking, national satellite Internet project and high-resolution Earth observation system, focus on cultivating Beidou system comprehensive application demonstration area, oriental spaceport industrial agglomeration area, satellite communication industry base, accelerate the construction of key projects such as aerospace information industry and Beidou kinetic energy, cultivate and expand satellite platforms, on-board loads, ground terminal manufacturing and other links, accelerate the commercial operation of satellite applications, and strive to build a whole industrial chain system integrating satellite research and development, manufacturing, launch, operation, application and supporting. Make the satellite industry a new growth pole that promotes the high-quality economic development of our province.

4. Deep sea and far sea. Break through a number of key technologies such as seabed resource exploration and development, deep-sea space exploration and operation, polar development and protection, coordinate and promote the construction of infrastructure such as marine stereoscopic observation network, marine communication network, submarine data center, submarine optical fiber and cable, develop deep-water drilling ships, deep-water semi-submersible platforms, deep-water submersibles, geophysical exploration vessels, underwater robots, deep-sea mining vessels, underwater production systems, marine mineral resources and natural gas hydrate exploitation equipment and

other deep-sea equipment, and promote polar research ships, polar icebreakers, polar ice area platforms, Design and construction of polar ships and equipment such as Antarctic krill ships.

专栏 7 未来产业布局
<p>生命科学。济南市、烟台市重点发展针对肿瘤、感染性疾病、罕见病的新型疫苗，加快干细胞应用、基因治疗、CAR-T 细胞治疗、抗体药物治疗等技术研发和转化。青岛市重点推动基因组学、细胞生物学、合成生物学等技术攻关。威海市、淄博市重点研发高端医疗器械、智慧诊疗技术、远程监测技术和大数据开发应用技术。临沂市、菏泽市、潍坊市、枣庄市、东营市加强植物、中草药和花类等植物提取技术研发与创新。</p> <p>柔性电子。烟台市重点推进 OLED 中间体技术开发与产业化。枣庄市重点培育柔性电子元器件产业链，打造轻柔显示产业中心。</p> <p>空天科技。济南市重点推动卫星研发、总装制造和遥感、导航应用等空天信息产业发展。青岛市重点发展飞机整机制造与装配、航空材料、航空电子等产业，积极布局卫星载荷、地面设备、应用终端和卫星通信等产业。烟台市重点发展火箭制造、卫星载荷研发制造等产业。</p> <p>深海远海。青岛市重点发展深远海油气矿产资源开发装备、水下探测作业装备、深潜器、海底光纤光缆等产业。烟台市重点建设深水半潜式平台、水下生产系统、海洋矿产资源和天然气水合物开采装备等深海装备产业。威海市重点建设海洋电子信息与智能装备、海空天一体化技术装备、极地船舶设计建设产业。东营市重点发展深远海油气资源开发装备。</p>

4. Advance tasks in key areas

Adhere to the idea of "keeping an eye on the frontier, planning along the chain, leading the way, cultivating and growing, creating an ecology and cluster development", focusing on strengthening innovation capabilities, optimizing industrial layout, upgrading industrial chains, cultivating high-quality enterprises, changing manufacturing models, strengthening quality brands, promoting digital empowerment, strengthening safe production, promoting green and low-carbon, deepening international cooperation and other key tasks, promoting advanced industrial foundation, modernizing industrial chains, and accelerating the stability and competitiveness of the industrial system.

(1) Enhance technological innovation capabilities.

1. Consolidate the basic capabilities of the industry. Focus on basic core areas related to industrial safety and development, such as basic components and components, basic software, basic materials, basic processes, and industrial technology foundations, strengthen basic research, applied basic research and common technology research through "unveiling" and other methods, promote the implementation of a number of forward-looking and strategic major science and technology projects, enhance the supply of source technology, and promote the overall leap of the entire industrial chain.

2. Strengthen the construction of innovation carriers. Comprehensive use of tax incentives, financial incentives, insurance compensation and other policies to encourage enterprises to increase investment in research and development and enhance innovation power. Promote the construction of various types of R&D institutions such as R&D centers, testing centers, design centers, and pilot bases, and accelerate the coverage of R&D institutions in industrial enterprises above designated size. Relying on advantageous enterprises and colleges and universities, accelerate the construction of a number of innovation consortia, and promote qualified provincial manufacturing innovation centers to strive for national centers. Improve the functions of small and micro enterprise entrepreneurship and innovation demonstration bases and small and medium-sized enterprise public service demonstration platforms, and create a number of comprehensive platforms integrating technology research and development, talent gathering, achievement transformation and business incubation, so as to stimulate the vitality of entrepreneurship and innovation of small and medium-sized enterprises.

3. Promote the transformation of innovation achievements. Accelerate the promotion and application of innovative achievements, deeply implement the insurance compensation mechanism in the fields of the first (set) technical equipment, the first batch of sub-new materials, and the first version of sub-high-end software, promote the interactive development of the whole machine (system) and basic technology, and form a virtuous cycle of new technological innovation application system. Strengthen the construction of technology market, improve the mode of transfer and

transformation of scientific research achievements, and promote the transformation of scientific and technological achievements into real productivity.

(2) Adjust and optimize the industrial layout.

1. Coordinate regional development. Deeply implement the ecological protection and high-quality development strategy of the Yellow River Basin, and strengthen industrial cooperation along the Yellow River Basin. Deepen the interaction and convergence with national regional development strategies such as the Beijing-Tianjin-Hebei region, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, and the Chengdu-Chongqing Twin Cities Economic Circle, strengthen exchanges and cooperation between Lugang, Luao and Taiwan, and improve the ability of joint construction, co-creation and sharing. Coordinate the coordinated development of "a group of two hearts and three circles" advantageous industries, promote industrial transfer cooperation in the province, and form a supporting and complementary pattern with reasonable allocation of factors, eco-friendly coordination, and obvious improvement in quality and efficiency.

2. Strengthen advantageous industrial clusters. Focus on key industries such as high-end equipment, high-end chemicals, smart home appliances, new energy vehicles, new materials, textiles and garments, non-ferrous metals, and health food, vigorously cultivate industrial cluster development promotion institutions and public service platforms, and create a number of influential and driving advanced manufacturing clusters at home and abroad. Guide cities and counties to focus on subdivided fields, and cultivate a number of advanced manufacturing clusters with distinctive characteristics of leading industries, high concentration of innovation factors, and close network cooperation.

3. Adjust and optimize energy-consuming industries. Strictly implement environmental protection, safety, technology, energy consumption, and efficiency standards, force the withdrawal of backward production capacity in high-energy-consuming industries, and fully implement the industry list management system. Adhere to the principle of "pressing the old to the new, pressing the small to the large, pressing down to the high, and pressing the loose and straightening", strictly implement the policy of replacing production capacity in key industries, accelerate the transfer of production capacity layout in the fields of iron and steel, georefining and other fields, and vigorously promote the construction of major projects such as Yulong Island refining and chemical integration, the world's high-end aluminum base, and the advanced steel industry base.

(3) Optimize and upgrade the industrial chain.

1. Strengthen systematic planning and promotion. Comprehensively sort out the upstream and downstream key links of the key industrial chain, accurately focus on pilot enterprises, key supporting enterprises, main characteristic advantages, urgent need to break through shortcomings, collaborative research technology, regional layout optimization, key construction projects, double recruitment and double introduction objects, can dock external resources and other fields, coordinate and promote the consolidation of the foundation, promote the advantages, make up for the shortcomings, strong and weak items, and effectively enhance the stability and competitiveness of the industrial chain and supply chain.

2. Strengthen the advantage of forging long plates. Based on the scale advantages and supporting advantages of machinery, chemical industry, building materials, nonferrous metals, textiles, papermaking, food, medicine and other industries, promote enterprises to focus on the main business, intensive farming, vigorously develop intelligent products, personalized customization, network collaboration, shared production, service-oriented extension, digital management and other new products and new models and new formats, master more unique skills, accelerate the realization of catching up and leading in key areas, further enhance the control of key nodes of the industrial chain, and shape a number of advantageous industrial chains with global influence and discourse power, accelerate the transformation from cost advantages to comprehensive competitive advantages such as R&D, design, and service.

3. Aim at weaknesses and make up for shortcomings. Focus on key areas and key links, establish a catalog of short boards in the industrial chain, strengthen application traction and machine drive, increase the research on core technologies, basic processes, major equipment, and scarce materials, accelerate the breakthrough of the "stuck neck" problem that restricts high-quality development, and build an independent and controllable, safe and reliable production and supply system. Pay close attention to the weaknesses of the short board "double tricks and double introduction", and accurately plan and promote a number of chain construction and chain extension chain projects with large investment scale, high technical level, good economic benefits and strong driving effect.

4. Improve the ability of stable development. Strengthen the monitoring and evaluation of industrial chain security risks, strengthen the dynamic monitoring and judgment of important indicators and key products, focus on core components, important raw materials, high-end equipment and other fields with high degree of external dependence, actively explore supply sources, seek alternative channels, do a good job in industrial chain backup, improve the resilience and anti-risk ability of the industrial chain, and build an independent and controllable, mutually beneficial and win-win cooperation system.

(4) Vigorously cultivate high-quality enterprises.

1. Build a "pilot" enterprise. Focus on key industries such as a new generation of information technology, high-end equipment, new materials, and high-end chemicals, and use the systematic thinking of "cross-industry, cross-region, and cross-ownership" to promote enterprise mergers and acquisitions and strategic cooperation, improve the level of large-scale and intensive operation, and accelerate the creation of a number of "pilot-type" enterprises with ecological dominance and core competitiveness. Support the restructuring of state-owned enterprises in the manufacturing sector and enhance the innovation, competitiveness and anti-risk ability of the state-owned economy.

2. Cultivate "specialized, specialized and new" small and medium-sized enterprises. Increase the guidance and support of fiscal, tax, financial and other policies, strengthen the construction of small and micro enterprise entrepreneurship and innovation bases, small and medium-sized enterprise public service demonstration platforms and other carriers, accelerate the cultivation of a number of high-quality small and medium-sized enterprises that focus on market segments, focus on main business, have outstanding innovation capabilities and high growth potential, and strive to cultivate about 300 provincial "specialized, specialized and new" enterprises, about 150 gazelle enterprises, about 80 single champion enterprises, and more than 3 unicorn enterprises every year.

3. Promote the integration and development of large and small enterprises. Support "pilot" enterprises to play the role of "chain masters" of the industrial chain, and drive small and medium-sized enterprises with high correlation and strong synergy into the industrial chain, supply chain and innovation chain through industry associations, industry alliances and other means in terms of technical research, product support, brand channels, and financial integration. Encourage small and medium-sized enterprises to strengthen collaborative innovation and supporting cooperation with "pilot" enterprises, continue to smooth industrial and market circulation, and promote the formation of a modern industrial system with higher efficiency and lower cost.

4. Promote the modernization of enterprise management. Guided by the new development concept, we will carry out in-depth special actions to improve the enterprise management system, and encourage and support enterprises to seek quality, efficiency and benefit from management. Regularly select a number of outstanding achievements in enterprise management innovation, demonstrate and promote advanced management experience and tools and methods, guide enterprises to improve the level of strategic management, operation management, marketing management, financial management, human resource management and other aspects of benchmarking, accelerate the improvement of modern enterprise systems, and promote the modernization of corporate governance.

(5) Promote the reform of manufacturing models.

1. Intelligent manufacturing. Accelerate the cultivation and promotion of a number of high-level intelligent manufacturing equipment, create a number of intelligent manufacturing benchmarking enterprises, build a number of intelligent factories and digital workshops with strong leading role and significant comprehensive benefits, explore and form a number of new intelligent manufacturing models with obvious results, replicable and easy to promote, and improve the level and application level of intelligent manufacturing. In-depth implementation of intelligent technology transformation action plan, support enterprises to focus on key links such as key process automation, key position robot substitution, intelligent optimization control of production process, intelligent supply chain management, etc., integrate and use independent and controllable intelligent manufacturing equipment, software and control systems, and coordinate and promote automation, digitalization, networking, and intelligent transformation and upgrading.

2. Green manufacturing. Focusing on the greening of the whole life cycle of products, vigorously develop green products with the characteristics of energy saving, environmental protection, harmlessness, high reliability, long life, and recyclability, and improve the quality of green product supply. Build high-quality green factories, promote enterprises to accelerate the elimination and efficient replacement of inefficient equipment, improve basic measurement capabilities and comprehensive improvement of energy and environment, and accelerate the improvement of energy resource utilization efficiency. Continue to build green industrial parks, promote the utilization of energy cascades, comprehensive utilization of waste, efficient recycling of water resources, and build a low-carbon and zero-carbon-oriented resource and energy system and circular economy industrial chain. Accelerate the establishment of green supply chains, encourage leading enterprises in the industry to build a green supply chain management system with data support, network sharing and intelligent collaboration, and run the green and low-carbon concept through the whole process of product design, procurement, production, sales, recycling and reuse, and improve the level of supply chain collaboration.

3. Service-oriented manufacturing. Actively develop mass personalized customization, develop personalized design, user participation design, interaction design, promote parts standardization, parts refinement, component modularization and product personalized reorganization, and enhance customized design and flexible manufacturing capabilities. Strengthen the construction of industrial design platform, rely on Yantai City to actively create the world design capital, strengthen and optimize Shandong Industrial Design and Research Institute, carry out the application and promotion of crowd-creation, crowdsourcing, crowd-design and other modes, and accelerate the cultivation of a number of professional design institutions, industrial design masters and well-known design brands. Focusing on the whole life cycle of products, information value-added services, inspection, testing and certification licenses, build a number of demonstration platforms with complete functions and efficient operation. For key links such as casting, printing and dyeing, and molding, we will lay out and build a number of regional shared manufacturing platforms, centrally allocate production equipment with strong versatility and high purchase cost, and build shared factories that provide flexible services such as time-sharing, piece-rate, and value-based pricing. Focus on key areas such as process reengineering, intelligent equipment upgrading, after-sales monitoring and maintenance, and skilled worker training, and vigorously develop industrial technical services.

(6) Strengthen the brand of quality standards.

1. Comprehensively improve product quality. Adhere to the enterprise as the main body of quality improvement, strengthen total quality management, promote the application of advanced quality management methods, support enterprises to aim at advanced benchmarks to implement technological transformation and management upgrading, improve the level of all-round quality control of the whole process of all employees, improve manufacturing quality with meticulous work, and promote the development of Shandong industrial products in the direction of safety and health, high quality and stability, intelligent and environmental protection.

2. Improve the advanced standard system. Give play to the basic, strategic and leading role of standards in promoting high-quality development, encourage leading enterprises to drive upstream and downstream small and medium-sized enterprises to jointly carry out standard development, and promote the formation of a unified and coordinated standard system. Focusing on key areas such as the "four new" economy, digital economy, high-end equipment, high-end servers, industrial Internet, new materials, and green manufacturing, accelerate the organization of the formulation of industry standards and local standards, and lead the high-quality development of the industry with high standards. Guide social groups in formulating advanced group standards with technical levels better than national and industry standards, and encourage the formulation of group standards for graded quality evaluation.

3. Vigorously implement the brand strategy. Carry out the century-old brand enterprise cultivation project by industry, field and level, guide enterprises to strengthen brand awareness and cultivation ability, further polish "time-honored brands", call "big brands", support "growth" brands, focus on enhancing the popularity, reputation and core competitiveness of "Good Product Shandong", and promote more Shandong products to integrate into the dual circulation and open up new markets.

4. Optimize product supply structure. Carry out in-depth special actions to increase variety, improve quality and create brands in the consumer goods industry, encourage enterprises to enhance the supply capacity of high-end equipment and advanced materials according to advanced standards at home and abroad, implement a strict selection plan for high-quality industrial products, and launch marketable products for the main sales areas and hot industries of our province to meet new needs and promote consumption upgrading.

5. Actively expand online sales. Carry out the special action of "Made in Shandong and Internet Travel" in depth, encourage manufacturing enterprises to cooperate with various e-commerce platforms, supply chain platforms and foreign trade service platforms, and use new marketing methods such as exhibition platforms, online live broadcasts, and online exhibitions to consolidate traditional markets and seize emerging markets. Hold ordering meetings, organize buyers to select goods online and order offline. Strengthen the support of network marketing services, drive more manufacturing enterprises to achieve rapid transformation of online sales, and build a super industrial city.

(7) Further promote digital empowerment.

1. Accelerate the construction of new infrastructure. Accelerate the construction of new information infrastructure such as 5G networks and data centers, improve the new generation of ultra-high-speed, large-capacity and intelligent communication networks, and strive to achieve a 2025% user penetration rate of 5G networks by 56. Promote Qingdao to strive to become an international communication service import and exit bureau, and comprehensively promote the commercial deployment of Internet Protocol version 6 (IPv6). Encourage enterprises to accelerate the transformation of internal networks and external network upgrades, and strengthen the categorical and hierarchical management of enterprise network security. Strengthen the construction of secondary nodes for identification and analysis of the industrial Internet, and promote the creation of "Spark Chain Network" super nodes in Jinan. Deepen the construction of the Jinan-Qingdao Artificial Intelligence Innovation and Application Pilot Zone, promote the construction of Shandong Future Network Research Institute, accelerate the construction of "China Arithmetic Valley", and improve the basic support capacity for the digital industry.

2. Promote the digital transformation of industries. Adhere to categorical policies, and carry out digital manufacturing popularization, networked manufacturing demonstration, and intelligent manufacturing exploration by industry and step by step. Carry out in-depth digital transformation actions in the manufacturing industry, and use digital technology to empower the development of manufacturing industry in an all-round, all-angle and full-chain manner and improve total factor productivity. Accelerate the construction of a number of digital transformation public service platforms, implement the "<>,<> digital commissioners" service action, and adopt "cloud service voucher"

subsidies and other forms to promote the digitalization of production factors, flexible production processes and system service integration of small and medium-sized enterprises.

3. Make every effort to strengthen the industrial Internet. Deepen the "Ten Hundred" platform cultivation project, build about 3 comprehensive industrial Internet platforms with national influence, more than 10 national characteristic professional platforms, and more than 100 vertical industry platforms, accelerate the construction of Yantai City into an industrial Internet manufacturing innovation base in the Jiaodong Economic Circle, and build Qingdao into the world's industrial Internet capital. Actively expand typical application scenarios of the industrial Internet, accelerate the construction of three national platform application innovation and promotion centers, cultivate a number of industrial Internet parks, deepen the supply and demand docking between industrial Internet enterprises and manufacturing enterprises, support industrial APP (application) development and big data applications, build an industrial ecology of "industrial Internet + intelligent manufacturing" and "modern advantageous industrial cluster + artificial intelligence", build a high-level industrial Internet demonstration zone on the Shandong Peninsula, and consolidate and enhance the first-mover advantage in the field of industrial Internet. By 2025, the proportion of industrial Internet applications in industrial enterprises above designated size will reach about 20%.

4. Deepen the integration and application of industrial big data. In machinery, chemical, textile, food, medicine and other industries, carry out innovative applications such as intelligent workshops, digital twins, remote monitoring and diagnosis, and create a number of digital application "lighthouse factories" and "morning star factories". Focus on data sharing, data openness, data transactions and public services to build an industrial big data platform. Carry out the construction of multi-level linkage industrial basic big database, and build a number of industrial thematic databases such as industrial economic data, industrial industry data, industrial enterprise data, and industrial investment data. Promote the construction of the national industrial Internet big data Shandong branch center (national regional node), build a number of provincial industrial big data regional centers and industry centers, lay out several edge centers, and improve the "national-provincial-edge-level" industrial big data center system.

(8) Improve the level of safe production.

1. Build a long-term mechanism for safe production management. Adhere to source governance, system governance, and both symptoms and root causes, establish a major safety risk prevention mechanism, and strictly prevent the occurrence of major and extraordinarily serious production safety accidents. Improve the responsibility system for safe production, strengthen risk monitoring and early warning, and improve the ability of safe production governance. Deeply promote the dual prevention system of graded risk control and hidden danger investigation and management and the construction of safety production standardization, solidly carry out large-scale investigation and rectification actions for safe production, implement special supervision and on-site supervision of safe production, and promptly and effectively investigate and eliminate potential safety hazards. Comprehensively use laws and regulations, industrial policies, industry standards, technical specifications, transformation and upgrading, elimination and backwardness and other means to prevent and resolve hidden risks, and promote the withdrawal of production capacity that cannot meet safety production standards in accordance with laws and regulations.

2. Compacting the main responsibility of the enterprise. Strictly implement enterprise and project site selection, production operation process and space layout, etc. to meet the safety requirements of planning and design. Supervise and urge enterprises to establish and improve the safety production management system for the whole process of production and operation, and strictly implement the responsibility system for safe production of all employees. Strengthen employee education and training, enhance safety awareness, strictly control the safety quality access conditions for employees such as enterprise leaders, safety management personnel and special operation personnel in high-risk industries, and improve the occupational safety skills of personnel in key positions in key industries and fields.

Encourage enterprises to increase investment in safe production, promote the application of advanced safety production technology, equipment and processes, scientifically formulate operating procedures and process control indicators, implement "mechanized substitution, automation reduction, intelligent unmanned" in key risk positions, and improve the level of safety production guarantee.

3. Strengthen safety technical support. Promote the deep integration of informatization and intelligent technology with safe production, and improve the mechanization and automation level of dangerous processes and equipment for safe production. Aiming at the safety production needs in key areas such as civil explosions, hazardous chemicals, and metal smelting, promote the research and development of advanced technology and equipment, and improve the ability of safe production technology and product supply. Vigorously develop the emergency industry, accelerate the research and development of emergency technologies and products in the fields of monitoring and early warning, prevention and protection, disposal and rescue, build a number of emergency materials and production capacity reserve bases, increase the promotion of emergency products and emergency services, and provide strong support for the prevention and handling of emergencies.

(9) Promote green and low-carbon development.

1. Strictly implement "three lines and one order". Effectively strengthen the implementation and application of "three lines and one order" (ecological protection red line, environmental quality bottom line, resource utilization online and ecological environment access list), strictly implement the requirements of ecological environment zoning management and control in the whole process of industrial layout, structural adjustment, resource development, and site selection of major projects, continue to strengthen rigid constraints and policy guidance, and promote the high-quality development of the manufacturing industry with high-level protection of the ecological environment.

2. Effectively reduce carbon emissions. With carbon dioxide emission intensity control as the main and total emission control as the supplement, accelerate the establishment and improvement of carbon emission statistical accounting system, research and formulate the overall implementation plan for carbon peaking in the industrial field, and refine specific plans for key industries such as non-ferrous metals, building materials, iron and steel, and petrochemical chemicals. Effectively strengthen the R&D, innovation and promotion and application of technologies in the fields of carbon capture, carbon storage, and carbon recycling, carry out in-depth carbon dioxide emission reduction demonstration projects throughout the process, promote equipment renewal and technological transformation of enterprises, and accelerate the pace of green and low-carbon transformation. Actively play the role of market mechanisms in carbon reduction, and promote eligible key industries and enterprises to enter the carbon emission trading market.

3. Promote industrial energy conservation and water saving. Optimize the structure of industrial energy use, expand the proportion of new and renewable energy such as photovoltaic, wind power, and nuclear power, reduce the consumption of high-carbon energy such as coal and oil, and strengthen the energy-saving supervision of key energy-using enterprises and key energy-using equipment in high-energy-consuming industries. Focusing on industries such as iron and steel, refining, electrolytic aluminum, coking, tires, fertilizers, chlor-alkali, building materials, etc., vigorously promote energy-saving technical equipment and products, and continue to promote interface energy conservation and energy system optimization. Carry out in-depth energy efficiency "leader" actions, and focus on improving the energy efficiency of key energy-using equipment systems such as boilers, transformers, motors, pumps, fans, and compressors. Encourage key industries and industrial parks to increase the use of municipal sewage, seawater, rainwater, mine water and other unconventional water, and promote the recycling and graded reuse of industrial wastewater.

4. Promote the utilization of solid waste resources. Efforts should be made to reduce the amount of industrial solid waste generated in key industries such as metallurgy, building materials, chemical industry, coal power, and mining, and

promote the coordinated disposal of urban solid waste such as domestic waste and sludge by cement kilns. Promote the large-scale intensive utilization of bulk industrial solid waste such as smelting slag, industrial by-product gypsum, red mud, and chemical slag. Promote the efficient and high-value recycling of renewable resources such as scrap metal, waste plastics, waste tires, waste paper, waste electrical and electronic products, waste power batteries, waste textiles, waste glass, etc.

5. Reduce pollutant emissions. Strengthen the reduction of pollutants at the source, process control and efficient treatment at the end, continue to promote the reduction and substitution of harmful raw materials, vigorously promote cleaner production in key industries, carry out mandatory cleaner production audits in key industries such as energy, metallurgy, and chemical industry in accordance with the law, select a number of advanced cleaner production units, carry out the pilot of the overall audit mode of cleaner production clusters, increase the promotion and application of advanced and efficient environmental protection equipment, and accelerate the realization of ultra-low emission transformation in key industries. Vigorously promote the construction of eco-industrial parks, and take the construction of eco-industrial parks as an important part of the development assessment of the parks.

(10) Deepen international industrial cooperation.

1. High-quality participation in the construction of the "Belt and Road". Aiming at key technologies and processes, key basic materials, core components, high-end talents and other fields, we will effectively strengthen cooperation with local industries in RCEP member countries. Encourage enterprises with advantages in high-end equipment, heavy vehicles, electronic information, modern industry, new energy and new materials, medicine and medical equipment to carry out cross-border mergers and acquisitions and establish R&D centers in countries with a high level of scientific and technological development. Support backbone enterprises such as electric power equipment, petroleum equipment, marine engineering equipment, and construction machinery and equipment to carry out international equipment cooperation with South Asia, Central Asia, West Asia and other regions. Support powerful agricultural-related enterprises to cooperate with Russia, Central and Eastern Europe and other countries and regions, and promote the export of agricultural machinery and equipment, fertilizers, pesticides and other industries. Support enterprises with high resource dependence such as tires, papermaking, oil refining, and wood processing to establish cooperative development bases in resource-rich areas.

2. Strengthen regional cooperation between China, Japan and the Republic of Korea. Give full play to the advantages of geographical proximity, industrial integration and cultural connectivity with Japan and South Korea, focus on advanced manufacturing industries such as new generation information technology, high-end equipment, new energy vehicles, and biomedicine, as well as modern service industries such as industrial design, technology research and development, information technology services, medical care and health, and deepen regional industrial cooperation between China, Japan and South Korea in an all-round, wide-ranging and multi-level manner. Improve the cooperation mechanism with local governments and key enterprises in Japan and South Korea, deepen the series of activities of "Dialogue with Shandong", and actively build a demonstration zone for local economic and trade cooperation between China, Japan and South Korea.

3. Deepen the level of cooperation with Europe and the United States. Strengthen cooperation with major European countries in the industrial chain innovation chain, and upgrade the level of platforms such as Qingdao Sino-German Ecopark, China-Germany (Jinan) Small and Medium-sized Enterprise Cooperation Zone, and China-Europe (Weihai) Small and Medium-sized Enterprise Cooperation Zone. Promote exchanges and cooperation with local governments and enterprises in the United States and Canada, and expand the points of convergence of interests and complementary advantages. Timely grasp the scientific and technological innovation and industrial layout of large

global multinational companies, and promote a number of cooperation projects in key areas such as high-end equipment, intelligent manufacturing, and new energy vehicles.

4. Improve the level of international cooperation. Guide foreign investment in high-end manufacturing fields such as new generation information technology, high-end equipment, new materials, and biomedicine, and encourage overseas enterprises and scientific research institutions to set up global R&D institutions in Lu. Support enterprises in the province to actively integrate into the international industrial chain, supply chain and innovation chain, promote "soft connectivity" in policies, rules, standards, etc., promote the extension of industrial cooperation from processing and manufacturing to R&D and design, brand cultivation and other links, and enhance transnational operation capabilities and international competitiveness.

5. Safeguard measures

(1) Deepen the reform of systems and mechanisms.

1. Innovate development governance. Adhere to the party's comprehensive leadership, effectively give play to the role of the leading group for the construction of the province to strengthen the province, improve the organizational system that runs through and implements effectively, and establish and improve the cross-level, cross-regional and cross-department manufacturing high-quality development promotion mechanism. All departments at all levels should regard the construction of a strong manufacturing province as a "number one" project, and the main responsible comrades should study and deploy from above and take the lead in promoting implementation. Strengthen the comprehensive evaluation of the high-quality development of the manufacturing industry, further establish a clear orientation to promote the high-quality development of the manufacturing industry, and consolidate the pillar position and radiation driving role of the manufacturing industry in the economic and social development of the province.

2. Fully implement the "chain length system". At the provincial level, focus on the new generation of information technology, high-end equipment, new materials, high-end chemicals, medicine and medical equipment, building materials, food, light industry, textiles and other advantageous industries, and at the city and county (city, district) level, focus on local characteristic industries, establish and improve the "chain leader" work promotion mechanism led by "chain master" enterprises, industrial chain alliance cooperation, industry-university-research coordinated promotion, and factor guarantee services, accelerate the creation of a number of key industrial chains with more distinctive advantages, and enhance the stability and competitiveness of the industrial chain supply chain.

3. Strengthen the integration mechanism of production, education and research. Optimize the organizational methods of technological research, establish and improve the mechanism for the free and orderly flow of innovation resources among institutions of higher learning, scientific research institutions and enterprises, deepen the reform of the "unveiling system" for scientific and technological research and the "cabinet system" for chief experts, support leading enterprises to take the lead in establishing innovation consortia, key laboratories, manufacturing innovation centers and other major scientific and technological innovation carriers, gather education, science and technology, industry, finance and other advantageous resources to integrate to build a province's industry-university-research in-depth integration promotion platform, and improve the market-oriented innovation achievement transformation model.

4. Give full play to the role of market mechanisms. Focus on key areas such as technological transformation, intelligent manufacturing, network marketing, transformation of scientific and technological achievements, project investment and financing, cultivate a number of industrial chain and industrial cluster development promotion institutions, gather and develop a number of solution integration service providers, accurately meet the needs of enterprises, explore replicable and generalizable cooperation models, and better support and serve high-quality development.

(2) Strengthen fiscal, tax, and financial support.

1. Optimize fiscal and tax support methods. Fully implement the state's various tax reduction and fee reduction policies, and effectively reduce the tax burden of enterprises. The provincial, municipal and county levels of finance have strengthened the overall planning of funds, and comprehensively adopted methods such as equity investment, loan discounts, and post-event incentives to increase support for the manufacturing industry.

2. Improve financial service capabilities. Expand the scale of medium- and long-term loans and credit loans in the manufacturing industry, increase loans for technological transformation, and promote equity investment and bond financing to the manufacturing industry. Encourage financial institutions to innovate and optimize services, and vigorously develop manufacturing-oriented supply chain finance, green finance, intellectual property pledge financing, investment and loan linkage, financial leasing and other businesses. Strengthen the basic work of small and medium-sized enterprises, further expand the scale of first loan cultivation, medium and long-term loans, non-repayment renewal loans and credit loans, improve financing guarantees, emergency on-loans and credit enhancement risk sharing systems, and optimize the financial ecology of manufacturing enterprises.

3. Actively connect with social capital. Give full play to the guiding and leveraging role of Shandong Province's new and old kinetic energy conversion fund, attract social capital and financial institutions to participate together, enrich and expand various funds such as angel, venture capital and venture capital, increase investment in the manufacturing sector, focus on supporting major technological transformation of traditional industries and cultivation and development projects of strategic emerging industries, accelerate the expansion of potential enterprises, plan high-end projects, and lead industrial transformation.

(3) Strengthen coordination of key element safeguards.

1. Strictly control energy consumption. Strictly implement the requirements of dual control of total energy consumption and intensity and control of carbon emission intensity, ensure rational energy use, encourage energy conservation, control excessive energy use, restrict extensive energy use, and resolutely curb the blind development of "two highs" (high energy consumption and high pollution) projects under the premise that the total energy consumption is only reduced but not increased. Vigorously promote industrial energy conservation and consumption reduction, deeply tap energy conservation potential, improve energy utilization efficiency, and free up energy use space to give key guarantees to advantageous regions, advantageous enterprises and advantageous projects for the high-quality development of the manufacturing industry.

2. Strengthen environmental capacity guarantee. Strengthen the environmental supervision system with pollution discharge permits as the core, improve the positive incentive mechanism for enterprise pollution control, improve the standardization and precision of ecological environment law enforcement, implement differentiated management for enterprises with strong environmental awareness and high pollution control level, and give priority to ensuring the indicators required for the construction of major advanced manufacturing projects. Optimize trading mechanisms such as emission rights, energy use rights, water use rights, and carbon emission rights.

3. Ensure the demand for industrial land. Support all levels to adopt flexible methods to ensure the supply of industrial project land, and the top <> industrial counties (cities and districts) can determine the control ratio of industrial land in the total amount of land to be transferred each year according to the actual local conditions.

4. Increase unit factor output. Carry out in-depth evaluation reform of "mu production efficiency", implement differentiated resource element allocation based on evaluation results, promote the accelerated development of high-end, high-quality and efficient enterprises through positive incentives and reverse pressure, and promote low-end, low-quality and inefficient enterprises to carry out technological transformation and the withdrawal of backward production capacity.

(4) Accelerate the cultivation of industrial talents.

1. Strengthen the construction of expert think tanks. Relying on the strength of colleges and universities, scientific research institutions, industry associations, leading enterprises and other forces, build a number of high-end think tanks in the manufacturing field, gather a group of manufacturing expert think tanks, and better play the role of expert think tanks and think tank institutions in supporting government decision-making and promoting industrial development.

2. Actively attract high-end talents. Focusing on the development needs of new technologies, new industries, new formats and new models, vigorously implement talent projects, build a number of modern industrial colleges, promote the adjustment and optimization of professional structure and connotation improvement in colleges and universities, strengthen the construction of new engineering disciplines, and improve the quality of engineering professional talent training. Vigorously implement the project of updating the knowledge of professional and technical personnel, and strengthen the construction of continuing education bases. Establish a more competitive talent policy system, and increase the guarantee services for children's schooling, housing security, salary incentives, and entry and exit facilitation.

3. Cultivate and strengthen the team of outstanding entrepreneurs. Improve the training, incentive, supervision and service mechanism for entrepreneurs, select and commend outstanding entrepreneurs at different levels, select the best and give corresponding honors, encourage entrepreneurs to create more wealth for the society, and better promote the entrepreneurial spirit. Implement the pilot plan for entrepreneur development, strengthen the precise training of entrepreneurs and the relay training of young entrepreneurs. Organize regular seminars to promote the in-depth participation of entrepreneurs in the formulation of industrial policies. Vigorously publicize entrepreneurs with outstanding contributions, and create a public opinion atmosphere that respects and cares for entrepreneurs.

4. Strengthen the training of high-skilled personnel. Improve mechanisms such as high-skilled talent evaluation, competition selection, technical exchanges, job use, and commendations and incentives. Strengthen the construction of practical training bases for the integration of industry and education, promote the training of enterprise staff and the cooperation between schools and enterprises of high-skilled talents, and stimulate the innovation and creativity of high-skilled talents.

(5) Optimize and improve the business environment.

1. Create a fair and transparent environment for the rule of law. Protect the contractual rights and interests of market entities in contract, litigation and innovation in accordance with the law, and protect the personal and property safety of enterprise operators. Accelerate the improvement of local regulations and government rules and regulations, promptly clean up, revise and abolish provisions that are not conducive to maintaining fair competition in the market, and better solve enterprises' problems in property rights protection, investment and financing, fair competition, and so on. Unswervingly encourage, support and guide the development of the non-public economy, relax market access for the private economy, and break down all kinds of obstacles and hidden barriers that restrict market competition.

2. Continue to deepen the reform of "decentralization, management and service". Deepen "Internet + government services", optimize the comprehensive platform for government service enterprises, build a rapid response mechanism for service enterprises, improve the efficiency of government services, and reduce institutional transaction costs. Comprehensively build a fair and just, simple and efficient post-event supervision system with clear rights and responsibilities, deepen "double random, one open" supervision, and create a stable, fair, transparent and predictable business environment. Improve the "whole process" service mechanism for the formulation of enterprise-related policies and the "full cycle" of major project landing, and promote departmental coordination, factor agglomeration, and efficiency improvement.

3. Effectively reduce manufacturing costs. Aiming at the rigid upward pressure of manufacturing costs, comprehensively improve the monitoring, analysis and early warning of economic operation, comprehensively do a good job in the comprehensive coordination and guarantee of production factors such as coal, electricity, oil and gas transportation, and guide scientific and stable production in key areas and key industries. Strengthen the construction of the electricity market system and promote the full participation of manufacturing enterprises in electricity market-oriented transactions. Deepen the reform of the operation mechanism of oil and gas pipeline networks, and optimize the oil and gas supply mode and price formation mechanism. Standardize logistics charges for port shipping, road and railway transportation, etc. Improve the list of enterprise-related fee catalogues and the normalized publicity system, and seriously investigate and deal with enterprise-related illegal fees.

4. Accelerate the construction of an excellent industrial ecology. Grasp the strategic window period of deep adjustment of the global industrial chain and supply chain, concentrate advantageous resources in all aspects, forge long boards to make up for short boards with the efforts of the whole province, cultivate more industrial chain supply chains with national and even global competitiveness, build an excellent industrial ecology with more powerful leading traction, closer connection and support, more concentrated dual innovation elements, and more reasonable regional layout, and effectively enhance the "attractiveness" and "adhesion" of advanced industries, high-quality enterprises and high-end talents.

Responsible Editor: Ni Wenxiu

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