

# Made in China 2025 《中国制造 2025》

State Council, July 7, 2015

Manufacturing is the main pillar of the national economy, the foundation of the country, tool of transformation and basis of prosperity. Since the beginning of industrial civilization in the middle of the 18th century, it has been proven repeatedly by the rise and fall of world powers that without strong manufacturing, there is no national prosperity. Building internationally competitive manufacturing is the only way China can enhance its strength, protect state security and become a world power.

Since the founding of New China, and especially following the reform and opening up period, China's manufacturing sector has maintained rapid development and has built an industrial system that is both comprehensive and independent. It has greatly supported China's industrialization and modernization and significantly enhanced the country's overall strength. It has supported China's position as a world power. However, compared with the advanced economies, China's manufacturing sector is large but not strong, with obvious gaps in innovation capacity, efficiency of resource utilization, quality of industrial infrastructure and degree of digitalization. The task of upgrading and accelerating technological development is urgent.

At present, a new wave of technological and industrial revolution is aligning with the transformation of China's economic development and reshaping the structure of the international division of labor. China must seize this historic opportunity to implement a strategy of reinvigorating Chinese manufacturing and reinforce planning and forward deployment in accordance with the requirements of the "Four Comprehensive Points" strategic blueprint (a prosperous society, policy reform, rule of law, party discipline). We will strive to transform China into the global manufacturing leader before the centennial of the founding of New China, which will lay the foundation for the realization of the Chinese dream to rejuvenate the Chinese nation.

Made in China 2025 is the guide for China's manufacturing strategy during the coming decade.

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## 1. SITUATION AND ENVIRONMENT

### 1.1 Global Manufacturing Faces Significant Adjustment

The deep integration of next generation IT into manufacturing is triggering far-reaching industrial transformation and forming new production methods, industrial patterns, business models and economic growth points. All countries are promoting technology innovation in 3D printing, mobile Internet, cloud computing, big data, bioengineering, new energy resources and new materials. Intelligent manufacturing, such as intelligent equipment and plants based on cyber-physical systems, is creating a new manufacture revolution. The scope of manufacturing is expanding to include crowd-sourcing, collaborative design, mass customization, precise supply chain management, life-cycle management across the industrial value chain, wearable devices, and autonomous equipment and vehicles. China's manufacturing sector is facing a great opportunity to upgrade, innovate, and transform.

At the same time, global industrial competition is undergoing a significant adjustment that presents China with great challenges. After the global financial crisis, developed countries implemented 'Manufacturing Renaissance' strategies in order to regain advantages in manufacturing, and to promote new global trading and investment patterns. Meanwhile, developing countries are seeking to expand their share of global industrial labor and are investing in industrial capital to develop their export markets. Manufacturing in China is facing severe challenges from this "two-way squeeze" between developed and developing countries. In order to sustain China's manufacturing sector, we must have a global view and deploy new strategies, so we can turn challenges into opportunities and capture the manufacturing high ground in the new competitive landscape.

### 1.2 China's Economic Development Roadmap Faces Significant Changes

With the simultaneous development of new types of industrialization, informatization, urbanization, and agricultural modernization, pent up domestic demand is being released that will stimulate Chinese manufacturing. Demand will increase across many sectors, from industrial equipment, to private consumption, public services, and national defense. This new domestic demand requires rapid improvement of manufacturing technologies and innovation, improved commodity quality and safety, and upgraded public infrastructure. We will comprehensively deepen reform and expand 'opening up' to stimulate manufacturing innovation in order to transform and upgrade manufacturing capabilities.

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The economy of China has entered a New Normal and Chinese manufacturing is facing new challenges. With resource and environmental constraints growing, costs of labor and production inputs rising, and investment and export growth slowing, a resource and investment intensive development model that is driven by expansion cannot be sustained. We must immediately adjust the development structure and raise the quality of development. Manufacturing is the engine that will drive the new Chinese economy.

### 1.3 Building a Leading Manufacturing Power is Arduous and Pressing

After decades of rapid growth, China's manufacturing scale has become the largest in the world. China's comprehensive and independent manufacturing system has become the cornerstone of economic and social development, and is an important force supporting the global economy. Continuous technology innovation has greatly improved the overall manufacturing competitiveness of China. We have made breakthroughs in launching manned spacecraft and deep-sea submersibles, producing aircraft, launching the Beidou Navigation Satellite System, developing supercomputers, building high-speed rail, and installing ten-thousand meter deep oil drilling equipment. We have formed internationally competitive enterprises and laid the foundation to build China into an industrial power.

Nonetheless, China is still in the process of industrialization and there remain gaps between China and advanced economies. Chinese manufacturing is large but not yet strong. The capability for independent innovation is weak and external dependence for key technologies and advanced equipment is high. Enterprise-led manufacturing innovation systems have yet to be perfected. Product quality is not high and China has few world-famous brands. Resource and energy efficiency remains low, while environmental pollution is severe. The industrial structure and industry services remain immature. The manufacturing digitalization level is low and digital technologies have not been widely integrated into industry. The overall internationalization level is low and enterprises' capacity to compete globally is deficient. All of the above problems must be solved for China to become an advanced manufacturing power.

Developing into a manufacturing power requires China to firmly seize new strategic opportunities, actively meet challenges, strengthen overall planning, pursue innovation-driven development, make effective policies, leverage the advantages of its system, and mobilize all social forces to work with courage and determination. To realize the transformation from Made in China to Created in China, from China Speed to China Quality, and from Chinese products to Chinese brands, we must rely mainly on domestic equipment and companies. By doing so we can execute the strategic task of transforming Chinese manufacturing from large to strong.

## 2. STRATEGIC PRINCIPLES AND GOALS

### 2.1 Guiding Principles

We need to implement the guiding principles of the Eighteenth National Party Congress and the Second, Third and Fourth Plenary Sessions of the Eighteenth Central Committee in order to follow a new path of industrialization with Chinese characteristics.

Manufacturing innovation will be the theme, improving quality and performance the core, integration of the next-generation IT into manufacturing the main thread, intelligent manufacturing the main priority, and meeting the demands of economic and social development and national defense the goal. We should reinforce the industrial base, improve integrated levels and training systems for multi-talented personnel to promote industrial transformation, cultivate a manufacturing culture with Chinese characteristics, and realize the evolution of manufacturing from large to strong. The guiding principles are:

Innovation-driven Development - We will:

- Make innovation the guiding theme of manufacturing with breakthroughs in key technologies.
- Adapt institutions for innovation.
- Promote trans-industrial and interdisciplinary collaborative innovation, digitalization, network technologies, and smart technologies in manufacturing.
- Follow the innovation-driven path.

Quality First - We will:

- Continue to view quality as the core of manufacturing leadership, encourage enterprises to assume responsibility for product quality, and support quality-related research and domestic brands.
- Develop standardized laws and regulations, quality supervision systems, and a quality-first culture.
- Follow the path of competing with high quality.

Green Development - We will:

- Continue to take sustainable development as the focus of manufacturing power.
- Promote the application of energy-saving and environmental protection technologies, processes and equipment to enable cleaner production.

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- Follow the path of ecological development by developing the recycling economy, improving the efficiency of resource recycling, and establishing a sustainable manufacturing system.

Structure Optimization - We will:

- Pursue structural adjustment as the key facilitator of manufacturing power.
- Support development of advanced manufacturing, upgrade traditional industries, and transform production-oriented manufacturing into service-oriented manufacturing.
- Optimize industrial structure, cultivate industrial clusters, and follow the path of improving system and organization performance.

Talent-oriented Development - We will:

- Continue to develop talent as the foundation of the manufacturing influence.
- Develop pragmatic mechanisms for personnel hiring, placement, and training, and cultivate professional, technical, managerial, and administrative personnel to meet the demands of modern manufacturing.
- Create an atmosphere that supports an entrepreneurial mindset, develop a skilled manufacturing talent pool, and build rational organization structures.
- Follow the path of talent-driven development.

## 2.2 Basic Principles

Market-oriented and Government-led Development - We will:

- Comprehensively deepen reform, give markets the decisive role in allocating resources, strengthen the dominant position of enterprises, and stimulate the vitality and creativity of enterprise.
- Actively transform government functions, strengthen strategic research, improve relevant policies, and create a stable environment for enterprises.

Pragmatic Planning with Long-term Perspective – We will:

- Accelerate structural transformation, upgrade quality and performance, and develop sustainable manufacturing capabilities in regard to bottlenecks and weak links that restrain manufacturing.

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- Understand the new round of technology and industrial revolution and make strategic plans and farsighted policies to consolidate current advantages and capture the high ground to manage future competition.

Holistic Advancement and Breakthroughs in Key Areas - We will:

- Continue to integrate holistic considerations.
- Make wide-ranging plans and define innovation directions.
- Promote full integration of military and civilian manufacturing to improve the overall capacity level.
- Integrate resources, focus on key areas, implement major projects in focused areas, and make pursue breakthroughs aggressively in order to meet the demands of economic and social development and national security.

Independent Development Open to Global Cooperation - We will:

- Master core technologies, perfect the industrial supply chain, and cultivate domestic capabilities in strategic areas related to national welfare, the people's livelihood, and industry security.
- Continue to further expand the 'Opening Up' strategy to actively engage with global resources and markets, strengthen global distribution, promote international communication and cooperation, and develop new comparative advantages to improve the overall level of manufacturing.

### 2.3 Strategic Goals

In light of national conditions and global realities, China will work hard to realize strategic manufacturing goals by following the "Three Steps".

First Step - Strive to turn China into a major manufacturing power in ten years.

- By 2020, we will achieve industrialization, consolidate manufacturing power, and greatly increase manufacturing digitalization.
- We will master core technologies in key areas, strengthen competitiveness in areas where China leads globally, and greatly improve product quality.
- Digitalization, networking, and informationization of manufacturing will make significant progress. Energy and material consumption per unit of industrial added value and pollutant emissions by major industries will significantly decrease.

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- By 2025, the overall quality of manufacturing will improve greatly, innovation capacity will enhance markedly, overall labor productivity will increase greatly, and the integration of IT into industry will reach an advanced level.
- Energy and material consumption per unit of industrial added value and pollutant emissions of key industries will reach the developed economy level.
- China will have a number of multinational enterprises and industrial clusters with strong international competitiveness, and the position of China in the global division of labor and the global value chain will improve significantly.

### Second step:

- By 2035, Chinese manufacturing will reach an intermediate level among world manufacturing powers.
- We will greatly improve innovation capability, make breakthroughs in major areas, significantly increase overall competitiveness, lead global innovation in industries where China is most competitive, and comprehensively realize industrialization.

### Third step:

- By 2049, the centennial of the founding of New China, China's manufacturing sector status will become more consolidated and China will become the leader among the world's manufacturing powers.
- We will have the capability to lead innovation and possess competitive advantages in major manufacturing areas, and will develop advanced technology and industrial systems.



**Major Manufacturing Indicators, 2013 - 2025**

Category	Indicator	2013	2015	2020	2025
<b>Innovation Capability</b>	Internal R&D cost as a percentage of operating revenue of manufacturing firms (%)	0.88	0.95	1.26	1.68
	Invention patents per billion RMB of operating revenue (#)	0.36	0.44	0.70	1.10
<b>Quality and Value</b>	Manufacturing quality competitiveness (index)	83.1	83.5	84.5	85.5
	Manufacturing value-added rate (% increase over 2015)	-	-	2	4
	Average manufacturing labor productivity growth during the 5-year Plan (%)	-	-	7.5	6.5
<b>Integration of IT and Industrialization</b>	Broadband penetration (%)	37	50	70	82
	Digital R&D and design tool penetration (%)	52	58	72	84
	Key process control rate (%)	27	33	50	64
<b>Green Development</b>	Energy consumption decrease per unit of industrial value added (% decrease over 2015)	-	-	18	34
	Carbon dioxide emission decrease rate per unit of industrial value added (% decrease over 2015)	-	-	22	40
	Water consumption decrease per unit industrial value added (% decrease over 2015)	-	-	23	41
	Industrial solid wastes comprehensive utilization ratio (%)	62	65	73	79

### 3. STRATEGIC TASKS AND KEY POINTS

To fulfill the strategic goal of transforming China's manufacturing sector, we must follow the problem-oriented method, make an overall plan, and focus on key areas. The plan must embody the consensus of the entire society and lead to comprehensively increasing the development quality and core manufacturing competitiveness.

#### 3.1 National Manufacturing Innovation Capability

We will perfect the manufacturing innovation system, which is based on enterprises and guided by the market, and which integrates government, production, education, research and operations. China will innovate in accordance with the industrial supply chain and will require carrying out research into core technologies, apply scientific and technological achievements in practice, and improve innovation capabilities in major areas.

Research Core Technologies - We will:

- Give enterprises the main role in innovation, support enterprises to improve innovation capability, promote National Technology Innovation Model Enterprises and enterprise technology centers, and involve enterprises in the decision-making and implementation of national technology plans.
- Regularly formulate and release technology innovation roadmaps in major areas of manufacturing based on national strategy.
- Continue to implement the National Sci-Tech Special Projects and support research of through the National Science and Technology Plan.
- Enable key enterprises to play a leading role and universities and research institutions to play a supporting role to build a number of innovation coalitions and promote collaborative innovation involving government, production, education, research and operations
- Make breakthroughs in a number of key technologies which have significant impact on improving industrial competitiveness.

Innovation Design Capability - We will:

- Launch initiatives to demonstrate innovation design in major areas, such as traditional manufacturing, strategic emerging industries, and the modern service industry, and comprehensively promote advanced designs that are green, smart and collaborative.

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- Conduct research to support advancement in digital design, process-integration design, complex process design, and systematic design.
- Develop a number of key design software tools with domestic intellectual property rights and perfect an innovation design ecosystem.
- Build several innovation design clusters with international collaboration, cultivate industrial design enterprises, and encourage original equipment manufacturers (OEMs) to build R&D centers to transfer to knowledge to domestic brands.
- Develop innovation design education and set up the National Industrial Design Excellence Award to stimulate enthusiasm across society for innovation design.

### Industrialization of Scientific and Technological Achievements - We will:

- Perfect the transformation and operation mechanism of scientific and technological achievements by providing guidance for scientific focus, information publishing and sharing, technology transfer, and industrial services centered on the technological trade market.
- Improve incentive mechanism for commercializing research by reforming the usage, application, and revenue management of scientific and technological achievements in public institutions, and by improving evaluation and pricing mechanisms.
- Improve collaborative mechanisms through cooperation between government, production, education, research and operations in accordance with market rules and innovation practice, and direct financial and social capital to build a number of experimental centers of excellence for technology integration and engineering.
- Accelerate the transformation and industrialization of national defense and promote two-way transfer between military and civilian technologies.

### National Manufacturing Innovation System - We will:

- Strengthen overall planning, build a network of manufacturing innovation centers supported by engineering data centers, and promote market-oriented innovation selecting mechanisms and risk-reward sharing mechanisms that encourage innovation.
- Make full use of present technology resources and adopt new mechanisms and models of cooperation between government and society to build a number of Industrial Technology Research Bases and to carry out industrialization research and demonstration projects.
- Build a number of public service platforms to promote collaborative manufacturing innovation.

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- Standardize and promote professional services in technology research, inspection and detection, technology assessment, intellectual property trade, quality certification, and personnel training to promote manufacturing transformation.
- Build manufacturing engineering data centers in major areas to provide enterprises with platforms for sharing knowledge and data.
- Form Industrial Technology Research Bases to carry out basic research, industrialization, and personnel training in accordance with the demands of industrial transformation and innovation in areas such as next generation IT, intelligent manufacturing, additive manufacturing, new materials, and biomedicine
- Build 15 Industrial Technology Research Bases by 2020 and strive to build 40 by 2025.

### Standards System - We will:

- Reform the standards system, standardization management systems, and carry out comprehensive standardization in areas like intelligent manufacturing.
- Enable enterprises to play an important role in the process of standard setting, support alliances to promote standards, build innovation research bases to collaboratively research and establish standards.
- Establish standards to meet the demands of markets and innovation, and establish self-declaration and self-monitoring systems for products and service.
- Encourage and support enterprises, research institutions, and industry associations to participate in the process of making international standards, and work to accelerate the internationalization of Chinese standards.
- Vigorously make national security equipment adopt advanced civilian standards and promote the application of military standards in civilian areas.
- Robustly advertise and implement standards.

### Intellectual Property Rights (IPR) - We will:

- Strengthen IPR reserves in major areas of manufacturing and build industrialization-oriented patent pools strategically.
- Encourage and support enterprises to compete with IPR, cultivate enterprises with globally competitive IPR, and form IPR coalitions to promote collaborative use of IPR among domestic enterprises.
- Steadily promote decryption and marketization of national security IPR.

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- Establish and improve the IPR review mechanism and encourage and support key enterprises and professional institutions to cooperate in major areas on patent evaluation, acquisition, operation, risk assessment, and risk response.
- Build a public service platform to support use of IPR.
- Encourage multinational IPR licensing and formulate policies to lower the cost for small and medium-sized enterprises to apply for and protect IPR.

### 3.2 Full Integration of Informatization and Industrialization

We will promote the full integration of next generation IT and industrialization and take intelligent manufacturing as the main priority of integration. We will focus on developing intelligent equipment and products, making the manufacturing process intelligent, and cultivating new types of production methods to comprehensively improve the intelligence level of R&D, production, management, and services.

Intelligent Manufacturing Development Strategy - We will:

- Formulate intelligent manufacturing development planning and define development goals, major tasks and structure.
- Accelerate intelligent manufacturing standards and perfect the management criteria system of industrialization.
- Set up an intelligent manufacturing coalition to collaboratively promote intelligent equipment, R&D, systematic integrated innovation, and industrialization.
- Promote the integrated application of industrial Internet, cloud computing, and big data across the entire industrial chain from R&D and design to manufacturing, operations, management, sales and service.
- Strengthen network security of intelligent manufacturing control systems and overall system security.

Intelligent Manufacturing Equipment and Products - We will:

- Research intelligent production lines and intelligent manufacturing equipment like high-end, digitally controlled machine tools, industrial robots and additive manufacturing equipment, which feature depth perception, intelligent decision-making, and automation.
- Make breakthroughs in core intelligence component like sensors, meters, industrial control system, servomotors, drivers, and reducer.

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- Support precision manufacturing and agile manufacturing in key industries, including machinery, aerospace, shipping, automobile, light industry, textile, food, and electrical equipment.
- Make overall plans to promote R&D and industrialization of intelligent vehicles, intelligent machinery, robots, intelligent appliances, intelligent lighting equipment, and wearable equipment.

### Intelligent Manufacturing Processes - We will:

- Build experimental intelligent plants and digital workplaces to apply technologies that enable man-machine interaction, industrial robots, intelligent logistics management, and additive manufacturing, and promote the simulation, optimization, numerical control, real-time monitoring, and self-adaptive control of manufacturing technology.
- Accelerate development of product life-cycle management systems, customer relationship management (CRM) systems, and supply chain management systems.
- Integrate linkages between group management and control, design and manufacturing, and production and marketing.
- Strengthen intelligent detection and supervision systems in major industries like civil explosives, dangerous chemicals, food, printing and dyeing, rare earth metals, and pesticides.

### Internet Applications in Manufacturing - We will:

- Create a roadmap for the integration of the Internet into manufacturing systems to define the direction, goals, and path.
- Develop new manufacturing modes based on personalized customization, crowd-sourced design, and cloud manufacturing, and develop methods of research, manufacturing, industrial organization that are based on dynamically sensing consumer demands.
- Build a win-win industrial ecosystem.
- Accelerate Internet of Things research and application demonstration by cultivating new industrial Internet applications like intelligent monitoring, remote diagnosis and management, and supply chain tracking.
- Build innovation pilots of industrial cloud and industrial big data applications and set up advanced industrial cloud service and big data platforms to promote opening up and sharing of software, service, design, and manufacturing resources and standards.

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### Internet Infrastructure - We will:

- Strengthen planning and layout of industry Internet infrastructure and build industrial Internet features with low latency, high reliability and wide coverage.
- Apply and build optical networks, mobile networks, and wireless local area networks (WLAN) in manufacturing clusters to improve enterprises' broadband network access capabilities.
- Develop intelligent control systems, industrial application software, fault diagnose software, and related tools, as well as sensing and communication system protocols to realize real-time connection, precise identification, effective interactions and intelligent control of people, equipment, and products.

### Intelligent Manufacturing Projects - We will:

- Focus on key links in major manufacturing areas to carry out integrated innovation and industry applications of next generation IT and manufacturing equipment.
- Support collaborative research and industrialization of smart products and equipment. We will rely on strong enterprises to focus on key technologies, such as replacing people with robots in key positions, intelligent process control in production, supply chain optimization, and intelligent plants.
- Classify and make pilot demonstrations to promote manufacturing technology, discrete manufacturing, intelligent equipment and products, new formats and models, intelligent management, and intelligent services.
- Build intelligent manufacturing standard system and information security system and set up an intelligent manufacturing network system platform.

By 2020, intelligent level in major manufacturing areas will significantly increase. The operating cost of pilot demonstration projects will decrease by 30%. Production cycles will decrease by 30% and faulty product rates will decrease by 30%. By 2025, major manufacturing areas will become fully digitalized. Operation costs of pilot demonstration projects will decrease by 50%. Production cycle will decrease by 50% and faulty product rates will decrease by 50%.

### 3.3 Fundamental Industrial Capabilities

A weak industry foundation in essential spare parts and components, advanced techniques, key materials and industrial technology (hereinafter referred to as the “Four Foundations”) restrains Chinese manufacturing innovation and quality improvement. We must adhere to the principles of focusing on key problems, aligning production with demand, innovating collaboratively, and making technical breakthroughs at key points to remove the bottleneck that restrains industrial competitiveness.

Comprehensively promoting the “Four Foundations” is central to Chinese manufacturing evolution.

Project Planning to Define Primary Directions, Targets, and Approaches - We will:

- Publish development guidelines for the “Four Foundations”, issue reports on the Industrial Foundation Improvement Project and carry out the Industrial Foundation Improvement Project.
- Coordinate both military and civilian resources to make breakthroughs with joint efforts in civil-military dual-use technology and support effective exchange of civilian and military technology to promote integrated development.
- Strengthen fundamental standards and measuring systems and accelerate benchmarking in order to improve quality, reliability and lifetime value of products.
- Build multi-departments coordination mechanisms to improve factor efficiency.

Strengthen the “Four Foundations” Innovation Capability - We will:

- Strengthen fundamental research and focus on core technologies that affect the performance and stability of essential spare parts and components.
- Build a fundamental technology innovation system and make full use of available resources to build fundamental technology research institutions to coordinate joint efforts in key manufacturing technologies, such as advanced modeling and processing.
- Support enterprises to develop new technologies and to cultivate talents.
- Strengthen the research of fundamental proprietary materials to improve China’s self-sufficiency in the proprietary materials supply chain and manufacturing technology.
- Build the National Industrial Foundation Database to collect, manage, and apply enterprise test and measurement data.
- Put more efforts into the “Four Foundations” technology research by leading industry investment funds and venture capital firms to invest across projects addressing the “Four Foundations”.



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### Coordinate Development of Complete Machine Manufacturing - We will:

- Focus on demand incentives by aligning production with experience and conducting collaborative research in the area.
- Leverage the National Science and Technology Plan (special projects and funds) and related projects to enable development of complete machine manufacturing by coordinating “Four Foundations” related enterprises, universities and research institutions in key areas, such as digital control machines, railway transportation equipment, aerospace and aeronautics, and power generation equipment.
- Build industry coalitions, form a new model for collaborative innovation, and combine production and experience to improve localization of major equipment.
- Use the Industrial Foundation Improvement Project as a demonstration case to promote essential spare parts and components, advanced techniques and fundamental materials.

### Industrial Foundation Improvement Project - We will:

- Create demonstration projects by building risk-reward compensation mechanisms to support early movers and to illustrate interdisciplinary applications of essential spare parts and components, advanced techniques, and key materials.
- Support research collaboration between organizations in government, production, education, research and operations to remove China’s engineering and industrialization bottlenecks in fundamental materials and spare parts.
- Emphasize the supporting role of private platforms, build “Four Foundations” research centers, and create a number of public service platforms to improve fundamental technology system in major industries.

By 2020, 40% of essential spare parts and key materials will have domestic sources. The unfavorable supply chain situation will remit gradually in advanced industries, such as aerospace and aeronautic equipment, communication equipment, power generation and power transmission equipment, engineering machinery, railway equipment, and household appliances.

By 2025, 70% of the essential spare parts and key materials will realize have domestic sources. We will build an improved industrial technology service system and gradually form a complete machine-led industrial innovation development process in which enterprises can interact collaboratively.

### 3.4 Quality and Branding

China will improve quality-control technology, perfect quality management mechanisms, optimize the quality assurance environment, and overall strive to greatly improve the quality of domestic manufacturing. We will encourage enterprises to pursue excellent quality and build brand-name products with proprietary IPR to increase company value and to improve the image of Made in China.

Advanced Quality Management Technology and Methods - We will:

- Build a product standards conformity certification platform and promote technology and safety standard to comprehensively reach the level of advanced economies.
- Use leading enterprises as model showcases and demonstrations to promote advanced production management models and methods, such as six sigma, lean production, quality diagnose, and continuous quality improvement.
- Support enterprises to improve the ability of on-line quality monitoring, on-line control, and product life-cycle quality tracking.
- Promote technology optimization in major industries and improve control over key processes.
- Promote quality management activities, such as quality management groups.
- Strengthen quality management of small and medium enterprises and launch activities to improve the talent level, such as safety training, evaluation, and mentoring.

Product Quality - We will:

- Execute plans to improve industrial production quality.
- Make breakthroughs in technologies that have restrained product quality improvements, prioritizing major industries, such as automotive, digitally controlled machine tools, railway equipment, engineering machinery, specialty equipment, key raw materials, spare parts, and electronic components.
- Strengthen research and application of reliability design, testing and verification technology.
- Promote advanced modeling and processing methods, on-line detecting equipment, intelligent production, logistics systems, and detecting equipment to make indicators like performance consistency, quality reliability, environmental adaptability and service life of major physical products reach advanced levels in their categories.
- Apply quality management, self-declaration, and quality tracking systems across the product lifecycle in areas like food, pharmaceutical, infant and children supplies, and household appliances to protect the quality security of major consumer products.
- Improve the reliability of national defense equipment to strengthen the actual combat capability of national defense services.

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### Quality Supervision Systems - We will:

- Perfect product quality standard systems, policy planning systems, and quality management laws and regulations.
- Strengthen industry access and market withdrawal management in major areas related to people's livelihood and security.
- Build compulsory reporting systems for product incident in enterprises producing consumer goods and perfect information collection and publishing systems of quality credit to make enterprises the main body of quality responsibility.
- Set up a quality blacklist system by taking records of violation of laws and regulations in quality as important reference to rate enterprises' credit and intensify the power to crack down and punish illegal acts related to poor quality and counterfeit brands.
- Set up regional and industrial quality security warning systems to reduce risks related to quality security.

### Quality Foundation - We will:

- Formulate and implement manufacturing quality, security, hygiene, environmental, and energy-saving standards matching advanced international levels.
- Strengthen fundamental and frontier research of science and technology measurements to build a number of metrological standards with high accuracy and stability to improve the capabilities of national manufacturing quality monitoring.
- Establish national industrial metrology test centers and a national metrology innovation system.
- Perfect inspection and detection security systems by building high-level industrial quality evaluation laboratories and product quality supervision and inspection centers, and by encouraging professional detection technology coalitions.
- Perfect certification and accreditation management models by improving effectiveness of compulsory product certification and promoting voluntary product certification to improve management system levels and promote international authentication.
- Support industrial associations to publish self-discipline criteria or conventions and carry out quality commitment activities.

### Manufacturing Brand Building - We will:

- Encourage enterprises to build brand management systems focusing on R&D, production, quality management, and marketing to consolidate the basis of Chinese brands.
- Cultivate a number of professional institutions for brand cultivation and operation, and to provide brand management consulting and marketing service.

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- Perfect registration and management systems for collective brand and certification marks.
- Build competitive regional brands in industrial clusters with distinctive characteristics and a good market reputation.
- Cultivate brand culture by leading enterprises to strengthen brand awareness based on quality and reputation, establishing brand development concepts, and improving awareness of the added value and soft power of brands.
- Accelerate internationalization of China's brands.
- Intensify the power to promote Chinese brands and establish the image of Chinese brands by making full use of media.

### 3.5 Green Production

In order to intensify capabilities for researching advanced energy-saving and environmental technology and for accelerating the environmental updating of manufacturing we will actively promote low-carbon, recycling, increase the efficiency of manufacturing resource consumption, strengthen life-cycle green product management, and set up a high efficiency green manufacturing system.

Accelerate Green Manufacturing - We will:

- Comprehensively promote green upgrading in traditional industries like steel, nonferrous metals, chemicals, building materials, light industry, and printing and dyeing.
- Intensify the research capabilities and promote green technology and equipment to support waste heat and pressure recycling, water recycling, heavy metal pollution reduction, poisonous and harmful material replacement, utilization of industry waste residues, desulfurization, and dust reduction.
- Apply processing technologies like high-efficiency casting, forging and pressing, welding, surface treatment, and cutting to further green production.
- Research technologies to enable products that are lightweight, low power, and recyclable.
- Improve the energy efficiency of energy-using products like electrical machines, boilers, and combustion engines, and accelerate the elimination of outdated mechanical and electrical products and technology.
- Actively lead green development in emerging industries.
- Significantly decrease energy consumption in production and use of restricted substance content in electronic products.
- Build green data centers and green base stations to promote low-carbon development of new materials, new energy, high-end equipment, and bio-industry.

### Efficient Resource Use and Recycling - We will:

- Support enterprises to strengthen technology innovation and to improve green and lean production capability.
- Significantly reduce energy consumption, material consumption and water consumption.
- Continue to increase the ratio of green and low-carbon energy.
- Build a distributed low-carbon, smart micro-power grid in industrial parks and enterprises to control and reduce fossil energy consumption.
- Comprehensively promote recycling and promote materials and resource sharing among enterprises, industrial parks and industries.
- Promote the standardization and scaling of the recycling industry to strengthen support of technology equipment and improve comprehensive utilization of large industrial solid waste, scrap metal, and discarded electrical and electronic equipment.
- Intensify capabilities for high-end reproduction, intelligent reproduction and in-service reproduction, and promote production certification to promote sustained and healthy development of reproductions.

### Green Manufacturing System - We will:

- Support enterprises to develop green products, promote ecological designs to significantly increase energy efficiency in production and across the product lifecycle.
- Build green factories that realize intensification, material safety, clean production, waste recycling, and low carbon energy sources.
- Develop green industrial parks and promote industry coupling in industrial parks to realize near zero emissions.
- Build green supply chains by building resource-saving and environmentally friendly procurement, production, marketing, recycling and logistics systems, and by implementing an extended producer responsibility system.
- Strengthen green enterprises and support enterprises that implement a green strategy, green standards, green management and green production.
- Strengthen green supervision by perfecting energy savings and environmental regulations and standard systems, reinforcing energy saving and environmental protection supervision, promoting corporate social responsibility reporting systems, and implementing green assessments.

### Green Manufacturing Projects - We will:

- Carry out special technological upgrading to increase energy efficiency, clean production, water-savings and waste treatment and recycling in traditional manufacturing.
- Make industrial demonstration of technologies for energy-savings, environmental protection, resource efficiency, material reproduction, and low-carbon energy.
- Promote special projects to control sources of atmospheric pollution, water pollution and soil pollution.
- Formulate standard and assessment systems for green products, factories, industrial parks and enterprises.

By 2020, a thousand green demonstration factories and a hundred green demonstration industrial parks will be built. There will be a transformation of energy and resource consumption in some heavy chemical industries. Major contaminant emission intensity in major industries will decrease by 20%. By 2025, manufacturing green development and consumption of green products will reach advanced international levels and a green manufacturing system will be set up.

### 3.6 Breakthroughs in Major Areas

We will focus on strategic points like next generation IT, high-end equipment, new materials and bio-pharmaceuticals and devote social resources to develop strategic industries.

#### 3.6.1 Next Generation IT

##### Integrated Circuits and Special Equipment - We will:

- Improve integrated circuit design and continue to enrich intellectual property (IP) design tools.
- Make breakthroughs in core chips that are related to national information and network security and complete electronic machine development to improve the adoption of domestic chips.
- Master high-density packaging and three dimensional (3D) micro-packaging to improve the independent development ability of China's packaging industry and testing.
- Cultivate key manufacturing equipment supply chain.

##### Communication Equipment - We will:

- Master core technologies like new computing, high-speed Internet, advanced storage and systematic security.

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- Make breakthroughs in 5th generation mobile communication (5G), core routing switching, super high speed and large capacity intelligent optical transmission and core technology and architecture of the future network.
- Promote quantum computing and neural networking.
- Research equipment like high-end servers, mass storage, new routing switches, new intelligent terminals, next generation base stations and network security to promote systematization and scale applications of core communication equipment.

Operating Systems and Industrial Software - We will:

- Develop fundamental industrial software like operating systems and security.
- Make breakthroughs in high-end industrial software technology like intelligent design, simulation tools, industrial Internet of Things, and big data processing.
- Develop independent and controllable high-end industrial platform software and application software in major areas.
- Build and perfect integrated standard and safety evaluation systems for industrial software.
- Promote systematization and industrialization of independent industrial software.

### 3.6.2 High-end Digital Control Machine Tools and Robots

High-end Digital Control Machine Tools - We will:

- Develop precision machine tools capable of high speed, high efficiency and functional flexibility, and develop manufacturing equipment and integrated manufacturing systems.
- Accelerate research of frontier technologies and equipment like high-end digital control machine tools and additive manufacturing.
- Focus on reliability, stability and precision of major parts like high-end numerical systems, servomotors, bearings and grating to realize industrialization.
- Improve user process certification.

Robots – We will:

- Actively research new products and promote robotic standardization and market application modularization in order to meet demand for industrial robots in automobile, machinery, electronics, chemicals and light industry, specialty robots and service robots in medical treatment, domestic services, education and entertainment.
- Remove the bottleneck of essential spare parts like robot bodies, reducers, servomotors, controllers, sensors, drivers and integrated system design.

### 3.6.3 Aerospace and Aeronautic Equipment

Aerospace equipment - We will:

- Accelerate large aircraft research to develop wide-bodied airplanes and encourage international cooperation on heavy helicopter research.
- Promote industrialization of regional line aircraft, helicopter, unmanned aerial vehicles and general-purpose airplanes.
- Make breakthroughs in high thrust-weight ratio, advanced turboprop (turboshaft) engine and high bypass ratio turbofan engine and build a domestic industrial engine system.
- Develop advanced airborne equipment and systems to build an independent aerospace industry supply chain.

Aeronautic Equipment - We will:

- Develop the next generation carrier rocket and heavy carrier to improve the capacity to access space.
- Improve national and civilian space infrastructure by developing new platforms, satellite types, and Internet linking space, sky and ground.
- Cultivate long-term and stable spatial information services like satellite remote sensing, communication and navigation.
- Promote manned space flight and lunar exploration and moderate development of deep space exploration.
- Promote the transformation of aeronautic technology and the application of space technology.

### 3.6.4 Oceanographic Engineering Equipment and High-technology Shipping - We will:

- Intensify efforts to develop equipment and key systems for deep-sea exploration, resources exploitation, and offshore operations.
- Promote development and engineering of deep-sea space stations and large floating structures.
- Acquire capabilities for comprehensive testing, detection and evaluation related to marine engineering equipment to improve utilization of oceans.
- Make breakthroughs in luxury cruise design and construction, comprehensively improve international competitiveness of high-technology ships like liquefied natural gas carriers.
- Master core technologies for major corollary equipment in intensified, intelligent and modularized design and manufacturing.



3.6.5 Advanced Rail Transportation Equipment - We will:

- Apply new materials, technology and craft focusing on systematic security, energy savings and environmental protection, and digital technology to develop advanced and reliable products and lightweight, modularized products.
- Develop a next generation green, intelligent, high-speed and heavy-load rail transportation equipment system to provide customers with a total solution focusing on system life cycle.
- Build the world's leading rail transportation industry system.

3.6.6 Energy Efficient and New Energy Automobiles - We will:

- Continue to support electric automobiles and fuel cell vehicles.
- Master core automobile technologies for low carbon, informatization and intelligence.
- Improve engineering and industrialization capability of core technology like batteries, driving motors, efficient combustion engines, advanced derailleurs, lightweight materials and intelligent controls.
- Build a complete industrial system and an innovation system ranging from essential spare parts to complete automobiles.
- Promote energy-savings and new energy automobiles with independent brands to match advanced international levels.

3.6.7 Electric Power Equipment - We will:

- Promote industrialization and demonstrate efficient, super-clean emission coal power generation.
- Continue to improve the manufacturing level of high capacity hydropower generation facilities, nuclear power generation facilities and heavy gas turbines.
- Develop new energy and renewable resources equipment, advanced energy storage devices, intelligent power grid transmission and transformation, and end user devices.
- Make breakthroughs in the manufacturing and application of key components and materials like high-power electrical components and high temperature super conductors.

3.6.8 Agricultural Machinery Equipment - We will:

- Focus on advanced agricultural machinery needed in production of staple foods like grain, cotton, oil and sugar, and strategic commercial crops like breeding, ploughing and sowing, planting, maintenance, harvesting, transportation and storage.
- Develop high-end agricultural machinery like large tractors and duplex operation machines and tools.

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- Develop high-end agriculture equipment like efficient combine harvesters and core spare parts.
- Improve the capability of agricultural machinery in collecting information, intelligent decisions and precise operations.
- Develop total digital solutions for agriculture.

### 3.6.9 New Materials - We will:

- Focus on special function metal materials, high performance structural materials, functional molecular materials, special inorganic non-metallic materials and advanced composite materials.
- Research key technology and equipment for new material manufacturing like advanced smelting, coagulation casting, vapor deposition, section processing and efficient synthesis.
- Actively develop special new materials shared by military and civil sectors and accelerate two-way transmission and transformation of technology to promote civil-military integrated development in new material industries.
- Focus on the effect of disruptive new materials on traditional materials by planning and researching strategic frontier materials like superconductors, nano-materials, graphene and bio-based materials.
- Accelerate upgrading of fundamental materials.

### 3.6.10 Bio-pharmaceuticals and High-performance Medical Equipment - We will:

- Develop new medical products using chemicals and biotechnology to address critical diseases, including antibody drugs, antibody coupling drugs, new structural proteins, polypeptide drugs, and new vaccines.
- Develop innovation traditional Chinese medicine with prominent clinic advantages.
- Develop technologies to support individualized drug treatments.
- Improve the innovation capability and industrialization level of medical apparatus and instruments, focusing on efficient diagnosis and treatment equipment (imaging equipment and medical robots), high-value medical supplies (fully-degradable stent), and mobile medical products (wearable and remote diagnosis equipment).
- Make breakthroughs in new technologies like 3D bio-printing and induced pluripotent stem cells.

### 3.6.11 High-end Equipment Innovation Projects - We will:

- Carry out a number of innovation and industrialized special projects and major projects in large airplanes, aerospace-engines, gas turbines, civil aeronautics, intelligent green trains, new energy automobiles, ocean engineering equipment and high technology ships, intelligent power grids, high-end digital control machine tools, nuclear power equipment and high-end medical equipment.

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- Develop a number of iconic products and equipment to improve independent design and system integration capability.
- Remove the bottleneck of generic technology to realize engineering and industrialization.

By 2020, we will realize independent research and applications in the above areas. By 2025, the market share of high-end equipment with independent intellectual property will increase significantly. External dependence of core technology will significantly decrease. China's ability to provide fundamental auxiliary items will greatly increase. Equipment in major areas will reach advanced international levels.

### 3.7 Structure Adjustment in Manufacturing

We will drive traditional industries to develop to the mid-high end of the market and gradually reduce excess production capacity. This goal will be supported by promoting coordinated development between large enterprises and small and medium enterprises and by further optimizing manufacturing layout.

Promote Enterprises Technology Upgrading - We will:

- Support strategic major projects and high-end equipment technology upgrading.
- Stabilize the fund for central technological upgrading and build a long-term mechanism to support technology upgrades.
- Perfect the policy system to support technology upgrading by promoting legislation related to technology upgrades and strengthening incentives and restraint mechanisms.
- Support technology upgrading in major industries and products, and guide enterprises to adopt advanced technology to optimize product structures.
- Comprehensively improve design, manufacturing, technology, and management in industries like steeling, petrochemicals, engineering machinery, light industry and textiles to drive Chinese products to the top of the value chain.
- Formulate investment guidelines for major industries technological transformations to attract social capital and optimize the structure of industrial investment.
- Give high priority to upgrades in traditional areas through integration of IT and industrialization, energy saving and cost reducing, quality improvement and safety production.
- Promote new technology, new craft, new equipment and new materials.

### Excess Production Capacity Contradiction - We will:

- Strengthen and improve macro control and implement different policies in relevant industries based on the principles of absorbing, transferring, integrating and closing down to reduce excess production capacity.
- Strengthen industry standards and entry administration and drive enterprises to upgrade technology and equipment to optimize inventory capacity.
- Strengthen dynamic monitoring analysis of severe overcapacity industries by building and perfecting early warning system and guiding enterprises to quit overcapacity industries. We will let market play a role and comprehensively use means of law, economy, technology and necessary administration to accelerate closing down outdated production facilities.

### Coordinated Development between Large, Medium and Small Enterprises - We will:

- Strengthen the dominant position of enterprises in the market and support strategic cooperation and M&A to improve scale and cultivate conglomerates with strong core competitiveness.
- Stimulate the innovation vigor of small and medium enterprises and develop a number of specialized medium-sized enterprises that are prominent in niche markets.
- Support cooperation between Sino-foreign small and medium enterprises and support them to go global and attract foreign investment by making use of bilateral and multilateral cooperation systems.
- Guide large enterprises and small and medium enterprises to build coordinated relationship of collaborative innovation and win-win cooperation through division of labor based on specialization, service outsourcing and make to order (MTO).
- Develop a number of high-quality small and medium enterprise clusters.

### Optimize the layout of manufacturing - We will:

- Implement the National Regional Development Strategy and major function area planning.
- Comprehensively consider natural and energy resources, environmental capacity and market capacity when implementing industries plans and optimizing production systems.
- Perfect the industrial transfer guidelines, build a national industrial transfer information service platform and set up a number of demonstration parks to guide industry transfer and promote coordinated development of eastern, central and western manufacturing.
- Promote coordinated development of industries in the Beijing-Tianjin-Hebei Region and the Yangtze River Region.

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- Reform and upgrade manufacturing clusters to meet new industrialization requirements and to consolidate industrial clusters.
- Build a number of new industrial demonstration bases with highly efficiency industrial chain synergies, strong core competitiveness and sound public service systems.

### 3.8 Service-oriented Manufacturing and the Product Service Industry

Accelerating coordinated development of the manufacturing and service sectors and promoting business model innovation and structural innovation will allow China to increase manufacturing productivity and transform into service-oriented manufacturing. We will increase productive manufacturing services and develop service functional zones and service platforms.

Service-oriented Manufacturing - We will:

- Formulate guidelines to promote service-oriented manufacturing and implement service-oriented manufacturing plan.
- Launch demonstration projects to help manufacturing enterprises extend the service chain and transform from providing products to providing products and services.
- Encourage manufacturing enterprises to invest in services, develop customized services, practice life cycle management, execute network marketing, and provide online support services.
- Support eligible enterprises to evolve from equipment providers into integrated system contractors and from product providers into total solution providers.
- Encourage strong manufacturing enterprises to provide specialized service through business process re-building.
- Support eligible manufacturing enterprises to build financial institutions like financial service and financial leasing companies to promote finance and leasing services for large manufacturing equipment and production lines.

Development of Manufacturing Services - We will:

- Develop capabilities for manufacturing-oriented IT services, project design, and information application system development and integration in major industries.
- Encourage Internet enterprises to develop innovation business models around mobile e-commerce, online customization, online to offline, dynamic supervision, and early product alerts to realize seamless coupling with manufacturing enterprises and innovative business cooperation and value creation.
- Accelerate technology development of service supporting research and design, technology transfer, innovation incubation, IPR and technology consultation, as well

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as production service industries like third-party logistics, energy conservation and environmental protection, inspection and detection, certification, e-commerce, service outsourcing, finance and leasing, human resource management, after-sale service, and brand management to strengthen support for manufacturing transformation.

Service Functional Zones and Public Service Platforms - We will:

- Build manufacturing service functional zones that focus on modern services like research and design, information, logistics, business, and finance to improve influence capacity.
- Build a number of manufacturing service public service platforms in industrial zones.
- Encourage manufacturing enterprises in eastern areas to develop service-oriented businesses.
- Support central and western areas to develop specialized and competitive manufacturing services and develop service facilities to realize coordinated development between manufacturing and service industries.

### 3.9 Internationalization of Manufacturing

An overall plan is necessary to take advantage of international and domestic resources and markets. By accelerating implementation of the “opening up” strategy and combining the principles of “going out” and “bringing in”, China will expand into new areas and improve international cooperation. We will promote the internationalization of major industries and guide enterprises to strengthen international competitiveness.

Utilization of Foreign Capital and International Cooperation - We will:

- Further open manufacturing and optimize the “opening up” structure to improve performance.
- Encourage foreign capital to invest in high-end manufacturing like next generation IT, high-end equipment, new materials and bio-pharmaceuticals.
- Encourage foreign enterprises and research institutions to establish global research institutions in China.
- Support legible enterprises to issue stock and bonds overseas and to carry out technology cooperation with foreign enterprises.

Transnational Operation Capability and International Competitiveness - We will:

- Develop Chinese multinational enterprises and improve their core competitiveness by taking advantage of global resources, business process re-engineering, industrial chain integration and capital market operations.

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- Support enterprises to perform mergers, equity investment and venture capital investment overseas.
- Support enterprises to establish research centers, experimental bases and global marketing and service operations overseas.
- Support enterprises to carry out Internet design, precision marketing, value-added service innovation and media brand promotion which rely on internet and set up global industrial chain system to improve international operation and service.
- Encourage strong enterprises to develop international overall contract and total integration.
- Guide enterprises to integrate into local culture, strengthen awareness of social responsibility, improve investment and operation risk management and improve their ability to localize in foreign countries.

### International Industrial Cooperation and Internationalization - We will:

- Strengthen overall internationalization design by formulating a strategy for manufacturing to go abroad and building a planning and coordination system.
- Actively participate in and promote international industrial cooperation and implement major strategic plans like the Silk Road Economic Belt and the 21st-Century Maritime Silk Road to accelerate building interconnected infrastructure with surrounding countries and deep industrial cooperation.
- Make use of “opening up” along borders and build a number of overseas manufacturing cooperation parks in eligible countries.
- Let government promote and enterprises lead the innovation of business models.
- Encourage the overseas transfer of high-end equipment, advanced technology and strong industry.
- Strengthen policy guidance and drive industrial cooperation to extend from processing and manufacturing to cooperative R&D, joint-design, marketing and brand development in order to improve international cooperation levels.
- Innovate processing trade models and extend the domestic value-added chain to promote the transformation of processing trade.

## 4. STRATEGIC SUPPORT AND SUPPLY

In order to build a manufacturing power, we must put the socialist system to good use and mobilize all social forces. We need to further deepen reform and perfect policy and measures. Transforming Chinese manufacturing from large to strong will require flexible and efficient implementation mechanisms and cultivation of a manufacturing innovation culture with Chinese characteristics.

### 4.1 Institutional Mechanism Reform – We will:

- Comprehensively promote law-based government administration and speed up the transformation of government functions.
- Promote innovations in government management to support implementation of strategies, plans, policies and manufacturing standards.
- Strengthen industry self-regulation and the ability to provide public services and improve industrial governance levels.
- Delegate more powers to lower-level governments and to society in general by further deepening the reform of administrative review and approval procedures, standardizing approval systems, and simplifying procedures.
- Revise investment project directories pre-approved by the government and establish the principal role of enterprises in investment.
- Perfect collaborative research mechanisms involving government, production, education, research and operations and reform mechanisms for technological innovation management systems, project expenditure distribution, result assessment and transformation to promote capitalization of technology results and to stimulate manufacturing innovation vitality.
- Allow markets to determine production factor prices and allocate public resources.
- Reform trading systems for pollution discharge, carbon emissions and water rights, promote resource tax ad valorem collection, and transform environmental protection fees into taxes.
- Deepen state owned enterprise reform by perfecting corporation governance structures and developing the mixed ownership economy by further dividing industry monopolies and canceling unreasonable restrictions on the private economy.
- Steadily reform defense-related science and technology industries and promote civil-military integration.
- Perfect industrial safety review mechanisms and legal systems.
- Strengthen safety reviews for investment and financing, acquisition and reorganization, and bidding and purchasing in manufacturing areas central to the national economy and national security.



#### 4.2 Fair Market Environment – We will:

- Deepen market access reform by revising the “negative industry list”, strengthening supervision and abolishing policies and measures that constrain a unified national market.
- Implement scientific and normative systems to promote industry access by formulating and perfecting access standards in the areas of energy conservation, land conservation, water conservation, environmental protection, manufacturing technology and safety, and by strengthening supervision and inspection of national standards implementation.
- Unify enforcement and guide enterprises to adjust their structure through market means.
- Strengthen supervision to prevent the manufacturing and selling of counterfeit and faulty products, and harshly punish monopoly and unfair competition to create a positive operating environment for enterprises.
- Develop technology markets and perfect innovation, operation, management and protection mechanism of intellectual property.
- Perfect policies and measures for staff resettlement, redemption of debt, and enterprise transformation related to eliminating outdated capacity and perfecting mechanisms to exit markets.
- Further remove the burden on enterprises by implementing a fee list system, building a national fee list library, canceling unreasonable fees and apportionments, and strengthening supervision and accountability.
- Develop manufacturing enterprise credit systems by building a national manufacturing credit database and a system to dynamically review enterprise credit and for the purpose of awarding credit and punishing credit defaults.
- Strengthen enterprise social responsibility and promote self-declaration and supervision systems for products standards, quality and safety.

#### 4.3 Financial Support Policies – We will:

- Deepen financial reform by widening manufacturing financing channels and reducing financing costs.
- Actively take advantage of policy-based finance, development-oriented finance and commercial finance to support major areas like next generation IT, high-end equipment and new materials.
- Support Export-Import Bank of China to strengthen services for manufacturing “going out” within its scope of business.
- Encourage the China Development Bank to increase loans for manufacturing enterprises.

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- Lead financing institutions to develop products and business for manufacturing enterprises.
- Perfect multi-level capital markets by developing regional equity markets supporting eligible manufacturing enterprises to seek financing from domestic and overseas equity markets and to issue various debt financing tools.
- Lead venture capital and private equity to support manufacturing sector innovation.
- Encourage eligible manufacturing loans and leasing assets to carry out security pilot projects.
- Support large manufacturing enterprises and groups to carry out pilot projects integrating production and finance.
- Promote manufacturing transformation and upgrading by financing leasing.
- Explore insurance products and service for manufacturing and promote loan guarantee insurance and credit insurance industries.
- Increase support for manufacturing enterprises to carry out overseas resource exploration, set up research centers, and execute mergers and acquisitions using offshore financing against domestic guarantees, foreign exchange and RMB loans, debt financing and equity financing under the prerequisites of controllable risk and sustainable business.

### 4.4 Fiscal and Taxation Policy - We will:

- Make full use of present channels to strengthen financial support and the policy environment for manufacturing with a focus on key areas for manufacturing transformation, namely intelligent manufacturing, the “Four Foundations”, and high-end equipment.
- Use public-private partnerships (PPP) to allocate social capital to major projects, technology upgrading and key manufacturing infrastructure.
- Innovate the support way of fiscal fund by transforming from subsidizing construction to subsidizing operation step by step and increase the effectiveness of financial fund.
- Deepen technology planning (special projects and funds), technology management reform, and manufacturing technology research and demonstration projects to support technology innovation and structural adjustment.
- Perfect and implement government purchasing policies supporting innovation.
- Implement incentive policies, such as reducing the risk of investing in the first units of major equipment.
- Perfect incentive and control mechanisms for product innovation, value-added services and demonstration projects.

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- Implement taxation policies in favor of manufacturing transformation, promote added-value tax reform and perfect the calculation and auditing methods of research costs to reduce manufacturing enterprise tax burdens.

### 4.5 Multi-level Talent Cultivation Systems - We will:

- Strengthen overall planning and classified guidance on manufacturing talent development and implement manufacturing talent cultivation plan.
- Strengthen efforts to cultivate professional, technical, managerial and administrative personnel and perfect related talent development systems.
- Focus on improving modern operations by implementing the Quality Promotion Project for enterprises operations and management personnel and the Yin He Training Project to help small and medium enterprises cultivate entrepreneurs and high-level managerial personnel.
- Focus on high-level and high demand professional and technical personnel by implementing the Knowledge Personnel Improvement Project.
- Increase the number of advanced manufacturing engineers by building engineering and innovation training centers in universities.
- Strengthen vocational education and skill training by enables undergraduate universities to transform into applied technology universities and by building training bases to carry out modern apprenticeship pilot demonstrations.
- Encourage cooperation between enterprises and schools to cultivate researchers, technicians and inter-disciplinary professionals needed by manufacturing.
- Deepen enrollment numbers and quality of engineering doctorates and professional degrees to promote education combining production and research.
- Strengthen industrial personnel demand forecasting, strengthen personnel databases and build industrial talent assessment systems and information distribution platforms.
- Set up talent incentive mechanisms and increase recognition and rewards for excellent talents.
- Build and perfect manufacturing personnel service institutions and improve mechanisms for regulating the transfer of personnel between companies.
- Select talented young professionals and students, especially those with a professional and technical background, to go abroad for study and training, while building international training bases in China.

#### 4.6 Medium, Small and Micro Enterprise Policy - We will:

- Implement and perfect financial and taxation preferential policies to support small and micro businesses and optimize special funds for small and medium enterprises.
- Make use of the financial lever effect to attract social capital to set up national development funds for small and medium enterprises.
- Support eligible private capital to set up financial institutions like small and medium banks and encourage commercial banks to develop specialized financial services for small and micro enterprises, such as leasing guarantee systems and innovative financial products.
- Accelerate the development of a credit investigation system for medium, small and micro enterprises and actively develop financing and leasing, intellectual property, loans, and credit insurance policies for small and micro enterprises.
- Build and perfect the entrepreneurial foundation for small and medium enterprises and direct entrepreneurship investment funds to invest small and micro enterprises.
- Encourage universities, research institutions, and engineering centers to open and share experimental facilities for medium and small enterprises.
- Build integrated service systems for medium, small and micro enterprises by perfecting public service platform networks for medium, small and micro enterprises, and by building information sharing mechanisms to provide medium, small and micro enterprises with specialized service related to entrepreneurship, innovation, financing, consultation, training and recruiting.

#### 4.7 Manufacturing Openness - We will:

- Deepen foreign investment reform by developing guidelines for national treatment of foreign investment, improving mechanisms to manage the “negative industry list”, and implementing approval management models that contribute to a stable, transparent and predictable business environment.
- Comprehensively deepen foreign exchange management, customs supervision and inspection, and quarantine management reform to facilitate trading investment.
- Further relax controls over market entry by revising industrial policy in the steel, chemical and shipping industries to encourage manufacturing enterprises to bring in advanced technology and experienced talent and to invest in commissioned development, patent licensing and crowd-sourcing.
- Transform the utilization of foreign capital to emphasize joint ventures, collaborative development, outbound M&A, and recruiting top talent to work in China.
- Strengthen outbound investment legislation to reinforce legal protection for manufacturing enterprises to establish global operations by standardizing outbound operations and protecting the legal rights of enterprises.

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- Explore channels like industrial funds and state-owned capital gains, and implement outbound investment and merger reform to support “going out” by competitive industries, such as high-speed rail, electric power equipment, automotive and engineering equipment.
- Develop support and service institutions to accelerate “going out” by manufacturing enterprises, including building public service platforms for outbound investment and exporting trade services.
- Perfect early warning and coordination systems to reduce trading friction and manage major outbound investment events.

### 4.8 Organization and Implementation Systems:

A national leading group for rejuvenating Chinese manufacturing will be established and led by the head of the State Council, with group members appointed from relevant departments of the State Council. The main responsibilities of the leading group are: making overall plans and coordinating the overall rejuvenation of Chinese manufacturing; deliberating on major plans, policies, special projects, issues and working arrangements; strengthening strategic planning and guidance departments to support local governments in implementing plans. The group office will be established in the Ministry of Industry and Information and will undertake daily administrative work to support planning and execution. We will:

- Set up a strategic advisory committee for rejuvenating Chinese manufacturing to research future strategic problems affecting manufacturing and to provide consultation and evaluation to support major decisions affecting the manufacturing sector.
- Support multi-level, multi-area and multi-form think tanks with Chinese characteristics including social think tanks and enterprises think tanks to provide intellectual support to rejuvenate Chinese manufacturing.
- Set up inspection and third party evaluation mechanisms to monitor implementation of Made in China 2025 and to perfect statistic monitoring mechanisms, performance evaluation mechanisms, dynamic adjustment mechanisms and supervision and evaluation mechanisms.
- Establish midterm evaluation mechanisms for Made in China 2025 and make necessary adjustment to goals as required.

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All districts and departments should fully understand the significance of rejuvenating Chinese manufacturing, strengthening organization and leadership, optimizing work mechanism, and improving department synergies and coordination across government levels. All districts should integrate local practices to research and formulate concrete implementation plans and refine policy measures to ensure that plans are executed.

The Ministry of Industry and Information should strengthen tracking, analysis, incentives and guidance together with relevant departments and report major events to the State Council in a timely manner.