

# 2022 Sustainable Development Report of China's Industry and Information Technology

CHINA FEDERATION OF INDUSTRIAL ECONOMICS



CHINA FEDERATION OF INDUSTRIAL ECONOMICS

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## Preface

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In 2021, faced with the impact of the global COVID-19 pandemic and the severe and complicated international situation, guided by Xi Jinping's Thoughts on Socialism with Chinese Characteristics for a New Era, China's industry and information technology sector upheld the development concept that puts people first, based themselves on the new development stage, implemented the new development concept completely, accurately and comprehensively, built a new development pattern and promoted high-quality development. The supply-side structural reform was focused to accelerate the endeavor to build China into a network power and manufacturing power and to strengthen the industry value chain and supply chain, technological research, and digital transformation as a whole. The resilience of the global industrial and supply chains was strengthened, enabling the gradual recovery of the global economy thanks to the complete completion of the support for vaccines and major medical supplies. The sector actively promoted the transformation and development of industry in a green and low-carbon way, which helps China to achieve the goals of carbon peak and carbon neutrality as scheduled, cope with global climate change and promote inclusive and sustainable development. The sector continued to complete the 2030 United Nations Sustainable Development Goals, intended to make a positive advance in multiple goals and tried our best to assist other countries towards a green, low-carbon and sustainable development path. In 2022, we prepare the third Sustainable Development Report — Industry and Information Technology in China, which systematically sorts out the development priorities of China's industry and information technology sector from the point of view of innovation, technology and product sustainability in 2021, and explains the concepts and practices of industry and information technology enterprises in promoting the realization of the sustainable development goals of the United Nations. Besides, this Report fully and systematically discloses the outcomes of industrial and information technology sustainable development to society at home and abroad, elaborates the corporate social responsibility system in the field of industry and information technology, promotes and disseminates the latest practices of innovation upgrading in China's industry and information sector and responses to the attention of countries to Made in China.

This Report is widely supported by leaders and experts of the Ministry of Industry and Information Technology, guided by the Department of Industry Policy and Laws, and co-worked by local industrial and information technology departments, major industry associations and local industrial and economic associations. We express our heartfelt gratitude to the organizations and experts who have contributed to the Report. If not presented with sources, all data herein are sourced from public information of relevant authorities or the like in China. The information and data involved in this Report, if updated, be subject to the latest official statistics and information, due to inconsistencies in the preparation and release time of the Report.

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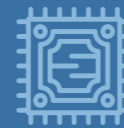
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## Make Contributions to Building a Modern Socialist Country in All Respects



**We will move faster to build a modernized economy. We will raise total factor productivity, make China's industrial and supply chains more resilient and secure, and promote integrated urban-rural development and coordinated regional development, so as to effectively upgrade and appropriately expand China's economic output.**



**— XI JINPING'S REPORT ON HOLD HIGH THE GREAT BANNER OF SOCIALISM WITH CHINESE CHARACTERISTICS AND STRIVE IN UNITY TO BUILD A MODERN SOCIALIST COUNTRY IN ALL RESPECTS TO TO THE 20<sup>th</sup> CPC NATIONAL CONGRESS ON BEHALF OF THE 19TH CENTRAL COMMITTEE OF THE CPC**

The five years since the 19th National Congress have been truly momentous and extraordinary. China's industry and information technology sector actively responds to grave, intricate international developments and a series of immense risks and challenges. Guided by Xi Jinping Thoughts on Socialism with Chinese Characteristics for a New Era, the sector accelerates new industrialization and informatization, strives to achieve the goal of comprehensive strength into the ranks of manufacturing power and a network power, and provides a solid material foundation for building a modern socialist country in all respects.

On the journey of a new era, China's industry and information technology sector actively implements the guidance of the report of the

Twentieth National Congress of the CPC, fully, faithfully and comprehensively carries out the new development philosophy, and insists on the theme of promoting high-quality development. The sector provides services to build a new pattern of development kept inheriting tradition, consolidating current advantages and innovating development, and accelerates the development of manufacturing power and network power, contributing to building a modern socialist in all respects and the realization of the great rejuvenation of the Chinese nation.

**The sector focuses on the development of the modern industrial system** and fully implements the 14th Five-Year Plan in terms of industrial and information technology. The sector also improves the planning implementation mechanism, and perfectly

performs a number of major projects, constantly yielding landmark results. The sector deepens the research on development ideas of key industries, and further, breaks down and improves key tasks and measures.

**The sector endeavors to drive high-quality development of key industries,** optimizes the system and layout of defense-related science, technology and industry, and expands equipment manufacturing and strategic emerging industries. The sector speeds up the development of the electronic information manufacturing industry, maintains the stable operation of the raw material industry; promotes the consumer products industry to increase varieties, improve quality and create brands; strengthens radio management, and makes the information and communication industry

better and stronger.

**The sector vigorously supports small, medium-sized and micro enterprises.** By improving the policy and regulatory system, and implementing the graded incubation plan for high-quality small and medium-sized enterprises, the sector stimulates the emergence of a large number of small-sized specialized, fined, peculiar innovative companies, little giant enterprises, and singles champion firms in manufacturing.

**The sector improves the resilience and security of the supply chain and the industry value chain.** By building strengths, improving weaknesses, and strengthening the foundation, the sector deeply implements industrial infrastructure reconstruction projects and key core technology research projects, accelerates new digital infrastructure, and steadily promotes the manufacturing

industry to enhance the manufacturing chain. **The sector bolsters the high-end, intelligent, and green development of the manufacturing industry,** vigorously promotes intelligent manufacturing, accelerates the growth of digital equipment, deepens the integrated application of 5G+industrial Internet, carries out the carbon peaking plan in the industry, and improves the green manufacturing system.

**The sector prevents and defuses major risks,** constantly improves network and data security capabilities, and strengthens work safety management in key industries. The sector comprehensively promotes COVID-19 prevention and control, supports the resumption of production, enables the sustained and stable recovery of the industrial economy, and helps the steady recovery of the global economy.

## Improves the Resilience and Security of the Supply Chain and the Industry Value Chain

Today, changes never seen in a century are coupled with the unprecedented pandemic, and economic globalization is becoming de-globalization. The implementation of the UN's 2030 Agenda for Sustainable Development is facing unprecedented challenges. To achieve inclusive and sustainable development, we should adhere to the harmonious coexistence of man and nature, and strive to build a community of creatures on the earth; we should remain innovation-driven, promote the deep integration of technology with the economy, and share the results; we should boost the partnership and form a development synergy; we should promote economic globalization, maintain the resilient and secure global industry value chain and supply chain, join hands to cope with the increasingly severe food and energy crisis, and recover world economy; we should shape a favorable development environment, build an open world economy, and promote balanced, coordinated, and inclusive global development.

A resilient and secure global industry value chain and supply chain is a guarantee to promote the world economy, which is in line with the common interest of people all over the world. China's industry and information technology sector firmly upholds the industry and supply chains as the public product, ensures the security and stability of the domestic industrial and supply chains, and deepens international cooperation in the industrial and supply chains with practical actions to benefit people more from all countries.

A sustainable economic and social environment requires a more resilient and secure global industry value chain and supply chain, whose resilience and security will, in turn, have a positive impact on the economic and social environment, so as to realize

sustainable growth of the economic and social environment and industry.

Resilient and secure global industry value chain and supply chain promote a sustainable economic and social environment in four aspects. 1) Stable and sufficient production and supply of compliant products ensure the material needs of economic and social activities. China's industry and information technology sector has actively improved the quality of the manufacturing supply system and the quantity, quality, and level of industrial product supply in all aspects. Among the world's 500 types of major industrial products, the output of more than 40% produced by the sector ranks first in the world. China has been the largest new energy vehicle producer for seven consecutive years. That promotes high-quality and sustainable economic development. 2) Focus on reducing the use of natural resources in the production process and improving the efficiency of resource recycling. China's industry and information sector can improve the utilization efficiency of energy resources and reduce waste emissions by accelerating energy conservation and carbon reduction in industrial fields, so as to promote the optimization and upgrading of the industrial structure, speed up the overcapacity cutting and transformation, accelerate the high-end industrial structure, and help the green and low-carbon transformation and development of the industry. 3) Focus on reducing the total life cycle GHG emission of products to cope with global climate change. Green manufacturing, green production, green design, green products, green supply chain, etc. can be promoted by strengthening sustainable consumption and production, so as to promote green cycle and low-carbon development, minimize the impact on the environment, and support the construction and development of sustainable industrial

and supply chains. 4) Adhere to people-centered development to promote decent labor. A platform for growth and development is provided by establishing harmonious labor relations and designing a reasonable income distribution mechanism so that workers in the industry value chain have access to fair and reasonable benefits. Attention is focused on workers' health and safety, and workers can share growth benefits with enterprises to stimulate their enthusiasm and development vitality.

Besides, a sustainable economic and social environment provides important conditions for a resilient and secure global industry value chain and supply chain. China's industry and information technology sector actively creates a platform to enable technological innovation and upgrade the industry value chains and supply chains. 1) Improve the industrial innovation system, encourage innovation and development across the industry chain, promote the industrial commercialization of innovations, increase the added value of products, and enhance the resilience of the industry value chains and supply chains. 2) Provide an external environment for balanced, coordinated, and inclusive development of the industry value chains and supply chains, implement regional major strategies and regional coordinated development strategies, build a connected ecosystem for large and medium-sized enterprises, promote the coordinated and sustainable development of the industry, continuously expand the field of opening to the outside world, and create a good business environment for foreign investors. 3) Help improve the people's livelihood, implement the "Increase Variety, Improve Quality and Create Brand" Campaigns to improve the quality of key industries, vigorously develop service-oriented manufacturing, and expand the production and supply capacity of

high-end products. The sector continues to narrow the gap between information and communication services between urban and rural areas to promote common prosperity. Meanwhile, the sector actively provides hardware and software infrastructure for the development of the industry value chain and supply chain. 1) Deepen the digital transformation, promote the formation of a number of advantageous industry value chains, build a number of model intelligent manufacturing factories, empower the development with digital technology, improve the operational efficiency of the industrial and supply chains, and promote energy and resource conservation. In 2021, the CNC rate for key processes and the penetration rate of digital R&D and design tools for key industrial enterprises in China reached 55.3% and 74.7%, respectively, 30.7 and 25.9 percentage points higher than in 2012. 2) Build sustainable infrastructure, and help the green and low-carbon transformation of the industry by building clean and sustainable infrastructure. The sector promotes the boom of the Internet economy and innovative industry value chains and supply chains by strengthening the construction and application of new information infrastructure. At last, attention should be paid to promoting a better connection of the industry value chains and supply chains with market demand. The sector actively promotes international cooperation and exchange, promote cross-boundary cooperation, and build partnership among the industry value chains and supply chains. The sector also works with international partners to build an industry value chain and supply chain system that is safe, stable, smooth, efficient, open, inclusive, mutually beneficial and win-win, so as to contribute to promoting the global economic cycle, helping the world economic growth, and enhancing people's well-being.

China's industry and information technology sector will unwaveringly expand their high-level opening up in the future and is expecting support and assistance from the international community to achieve more powerful, green and healthy global development synergistically. China is willing to continue to play the role of a responsible power, promote global cooperation in poverty reduction, food security, development financing and other fields,

implement the United Nations 2030 Agenda for Sustainable Development, and build a human community of global development with a shared future.

### Suzhou, Jiangsu Promoted the Open Innovation Pilot Among Full-industry Value Chain

Jiangsu focuses on the three major regions of Jiangsu's free trade experimental zone to build common advantageous industries of bio-medicine and accelerates the open and innovative pilot project across the whole industry chain. Around the institutional obstacles and development bottlenecks that restrict the bio-pharmaceutical industry, this area puts forth effort on tackling core key technologies, developing leading enterprises, building major platforms, introducing top talents, and creating a first-class industrial ecology, to help cultivate world-class bio-pharmaceutical industry clusters. So far, nearly 2,000 bio-pharmaceutical enterprises have been clustered in Suzhou Industrial Park, with an annual output value of more than 100 billion RMB. In the past three years, the area has accounted for more than 20% of innovative enterprises introduced and developed, the approved class-1 biology medicine, and the capacity of biology polymer medicine.

A delivery unit was required by Advaccine (Suzhou) Biopharmaceutical Co., Ltd. during the R&D of the COVID-19 import, which is not registered in China and cannot usually be imported in general trading. Benefiting from the first system of "hierarchical management of unregistered medical devices for R&D (testing)" for Jiangsu free trade pilot zone, companies can apply for the pharmaceutical devices needed for import in general trade, which is specifically used for R&D (testing), so that pre-linearization research on COVID-19 can be carried out effectively, which effectively guarantees the production and supply of plastics and contributes to the global COVID-19 pandemic respectively.



# 01 *Development of Sustainable Industrialization*



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Shenyang Blower Works Group Corporation (SBW) accelerates the deep integration of new-generation information technology and the high-end equipment manufacturing industry with the mission of "equipping the world with the smart chip", so as to boost the sustainable development of the industry.

## A New Level in Industrial Scale



China's industry and information technology sector has thoroughly implemented the strategic deployment of manufacturing powers, making historical achievements and changes in manufacturing development. With a more sound and complete industry value chain and complete manufacturing system, the sector has the most complete categories and industrial systems in the world. The quality of the manufacturing supply system has been greatly improved, and the quantity, quality and level of industrial products have been comprehensively enhanced. Among the world's 500 types of major industrial products, the output of more than 40% produced by the sector ranks first in the world. With top supporting capacity, the sector has a strong resilience and potential, and its comprehensive strength, innovation and competitiveness have reached a new level, laying a more solid material foundation for a moderately prosperous society in an all-round way and starting a new journey of building a modern socialist country in an all-round way.



2021

The value added of all industries was RMB **37,257.5** billion, up **9.6%** from the previous year.

Industrial value added produced by companies with annual revenue of 20 million yuan or more from their main business operations increased by **9.6%**, of which that produced by the manufacturing industry increased by **9.8%**.

The value added of China's manufacturing industry increased from **16.98** trillion RMB in 2012 to **31.4** trillion RMB in 2021, whose global share increased from **22.5%** to nearly **30%**.

**Ranking No.1 in the world for 12 consecutive years**

As of 2021, the equipment industry has had **105,100** companies with annual revenue of 20 million yuan or more from their main business operations, nearly **45.30%** up from 2012.

### Sustained and Stable Recovery of Industrial Economy

The assets of industrial enterprises with annual revenue of 20 million yuan or more from their main business operations totaled **141.29** trillion RMB, an increase of **9.9%** over the end of last year.

Industrial enterprises with annual revenue of 20 million yuan or more from their main business operations realized an operating income of **127.92** trillion RMB, an increase of **19.4%** over the previous year.

Industrial enterprises with annual revenue of 20 million yuan or more from their main business operations realized a total profit of **8,709.21** billion RMB, an increase of **34.3%** over the previous year.

and the profit rate of operating income was **6.81%**, an increase of **0.76%** over the previous year.

The cost per 100 RMB operating income of industrial enterprises with annual revenue of 20 million yuan or more from their main business operations was **83.74** RMB, a decrease of **0.23** RMB from the previous year.

**73** of the world's top 500 companies were shortlisted in the industrial sector of China, **24** brands in industry and information technology were ranked among the world's top 500 brands, an increase of **14** over 2012.

Investment in manufacturing restored gradually, with an increase of **13.5%** in 2021, and an average growth of **4.8%** in two years.

China has **41** major industrial categories, **207** medium industrial categories, and **666** minor industrial categories, and is the only country in the world that has all the industrial categories in the United Nations industrial classification. More than **40%** of the **500** main industrial products ranked top in the world in terms of production, and **39** of the **41** major industrial categories achieved year-on-year growth, **450** of **612** industrial products achieved year-on-year growth.

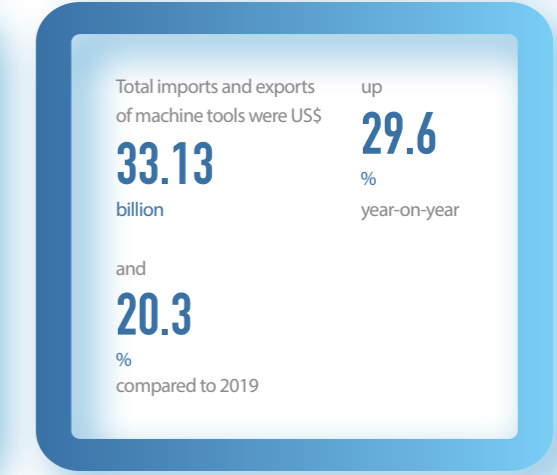
### Output Growth of Major Industrial Products in China

2021

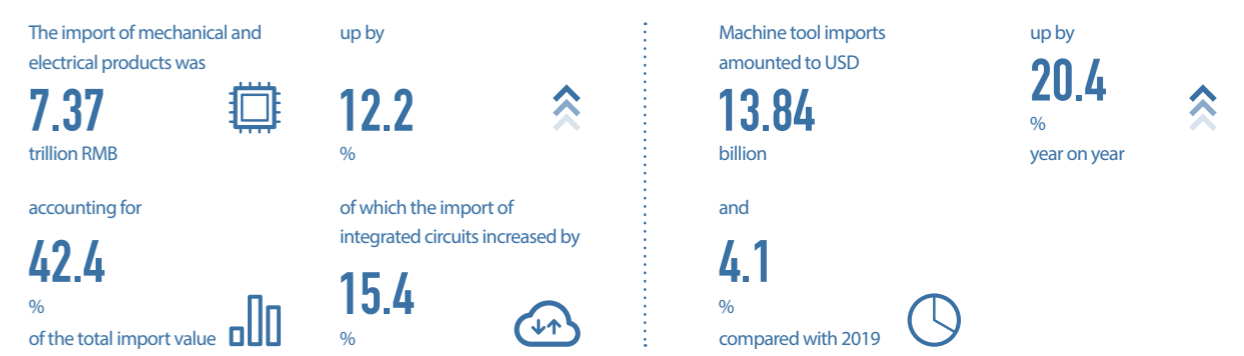
In terms of product output, intelligent and upgraded emerging products maintained rapid growth.



### Exports of Major Industrial Products from China



### Import of Main Industrial Products from China



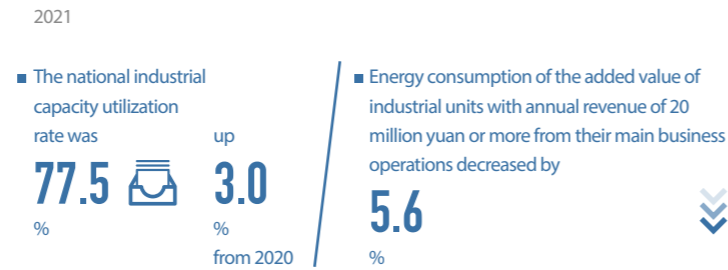


## New Upgrading for Industrial Structure Optimization

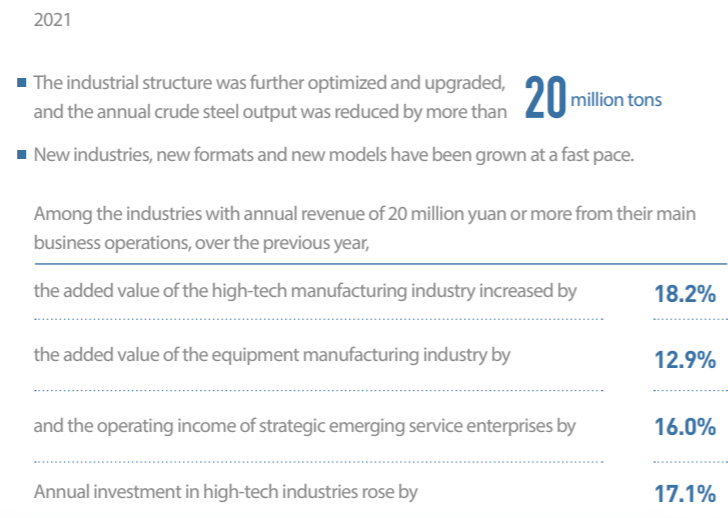


China's industry and information sector have pushed forward the supply-side structural reform and accelerated the optimization and upgrading of industrial structure. The resilience of the steel industry has been significantly enhanced by continuously cutting steel over-capacity and promoting transformation. The utilization rate of production capacity has basically recovered to a reasonable range. The industrial structure has become more reasonable. The industrial concentration has been significantly improved. The high-end industrial structure has been accelerated. The manufacturing industry has been pushed towards the high end of the value chain, and the core competitiveness of China's manufacturing industry has been continuously enhanced.

### Steadily Increased Industrial Capacity Utilization Rate



### Accelerate Upgrading and Optimization of Industrial Structure



### Harmonious Regional Development

2021



2021



## New Achievements in Technological Innovation



Technological innovation plays a key role in China's industrialization. As reform and opening up goes on, China has entered a new period of shifting the driving force of economic development, in which technological innovation is increasingly important to economic and social development, and technological innovation capacity has become the core of a country's international competitiveness in industry and information technology.

## New Resilience of the Industrial and Supply Chains



The security and stability of the industrial and supply chains are the basis for building a new development pattern. In recent years, China's industry and information technology sector has solidly strengthened the industry value chain and supply chain, enhanced the synergistic innovation of the industry value chain, and promoted the clustering of the advanced manufacturing industry. The ecosystem of industry value chain integration has been built to promote the rapid resumption of work and production among key industry value chains. The sector has deepened multi-bilateral innovation and capacity cooperation, promoted the deep integration of industry value chains and supply chains, and maintained the security and stability of global industry value chains and supply chains. In 2021, China's manufacturing chain maintained a safe and stable operation in general, with further increasing resilience in the supply chain.

### Continuous Increase in Investment in Innovation R&D

2012-2020

R&D expenditure of industrial enterprises with annual revenue of 20 million yuan or more from their main business operations increased by **1.1** times to **1.53** trillion RMB and input intensity increased from **0.77%** to **1.44%**



The number of industrial enterprises with annual revenue of 20 million yuan or more from their main business operations who conduct R&D activities increased from **47,000** to **147,000**

and the proportion among industrial enterprises with annual revenue of 20 million yuan or more from their main business operations who conduct R&D activities increased from **13.7%** to **36.7%**

The number of patent applications,



invention patent applications



valid invention patents by industrial enterprises



More than **570** industrial enterprises were shortlisted as one of the top 2500 R&D investments by global enterprises, **ranking No.2 in the world** for many consecutive years.

### Technological Innovation Achievements of Industrial Enterprises with Annual Revenue of 20 Million Yuan or More From Their Main Business Operations

R&D expenditure RMB hundred million



Number of patent applications 10,000 pieces



Invention patent applications ten thousand



Invention patents 10,000 pieces

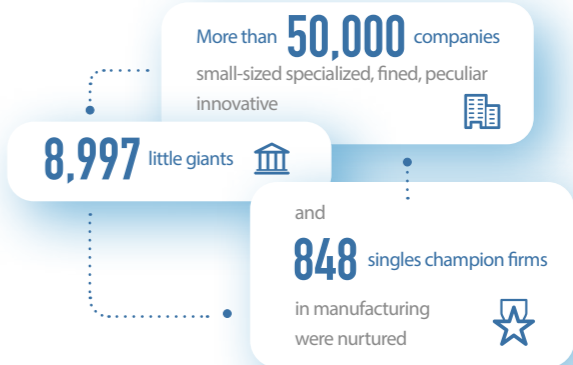


### SMEs Flourish

As of 2021

**328,000** enterprises were included in the national sci-tech SMEs database

SMEs are active in entrepreneurship and innovation, with continuously improved specialization.



**212** demonstration bases were built for mass entrepreneurship and innovation

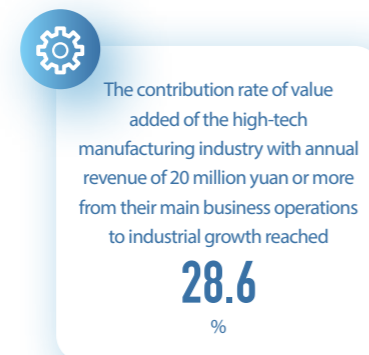
2021

**42** international standards for intelligent manufacturing and more than **300** national standards were published, with a coverage rate of **97.5%** for national standards for basic generic and key technologies.

An average increase of **48%** was made in the production efficiency of intelligent manufacturing pilot demonstration projects, an average reduction of **38%** in product development cycles, and a reduction of **35%** in the rate of undesirable products.

### Technological Progress in Basic and Key Areas

2021



As of 2021

A total of **445** national demonstration bases for new industrialized industries have been built, and **25** advanced manufacturing clusters have been cultivated.

## New Steps in Green and Low-Carbon Development



China's industry and information technology sector has actively implemented the carbon peak actions and carried out plans to improve industrial energy and water efficiency to steadily promote the green and low-carbon transformation of the sector. The sector has built "Two Systems" for green and low-carbon technology and green manufacturing and drove "six transformations" such as high-end industrial structure, low-carbon energy consumption, resource utilization, clean production processes, green product supply, and digitalization of production methods, thus taking a firm step forward in the green development of China's industry and information sector.

### Promote Low-carbon Transformation and Development Across the Sector

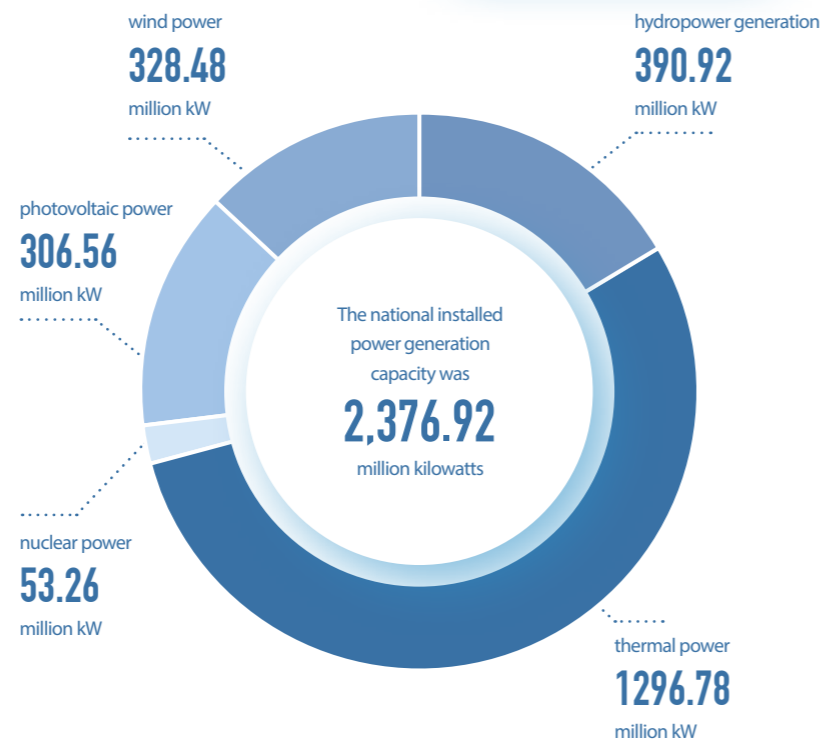
2021

■ **Energy consumption** for industrial value added by industries with annual revenue of 20 million yuan or more from their main business operations dropped by **28%** and **16%** respectively during the "12th and 13th Five-Year Plan" period

further by **5.6** % in 2021

■ **Water consumption** for industrial value added by industries with annual revenue of 10,000 RMB was down by **35%** and **39.6%** respectively during the 12th and 13th Five-Year Plan periods,

further by **7** % in 2021



As of 2021

- green factories: **2,783**
- green industrial parks: **223**
- green supply chain enterprises: **296**

have been developed

### Rapid Development of New Energy Vehicles

2021

■ The production of new energy vehicles was **3.677** million, an increase of **152.5** % over the previous year

with the production and sales of new energy vehicles ranking first in the world for seven consecutive years

■ The sales volume of automobiles reached **26.275** million, of which the sales volume of new energy vehicles reached **3.521** million, a year-on-year increase of **113.9** %

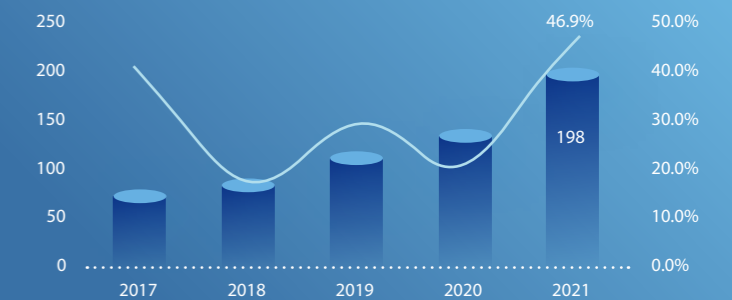
■ The national infrastructure for charging and replacing electricity increased by **936,000** units, with a year-on-year increase of **70.1** % and a total of **2.617** million units

■ As of 2021, a total of **75,000** charging stations, **2.617** million charging piles, and **1,298** power stations had been built, and **more than 10,000** power battery recycling service outlets had been set up in 31 provinces and cities across China

2021

■ The output of solar cells (photovoltaic cells) in China was **198** million kilowatts, a year-on-year increase of **46.9** %

Cell output in China in 2017-2021  
unit: GW



■ The number of solar cells exported was **281.85** million kilowatts, with an export value of **3,039.1** million dollars

■ China's solar modules accounted for more than **75** % of the global market share

■ The output of polysilicon, silicon wafers, battery cells, and components in China accounted for more than **70** % of the total global output

## New Momentum Added to Digital Transformation



Digital transformation is the must-have way for the industrial economy to step up to the digital economy. China's industry and information technology sector further the digital transformation of intelligent manufacturing engineering and manufacturing, to deepen the integrated development of cluster computing, big data, AI and manufacturing, and to further the digital transformation and intelligent upgrading of manufacturing. The sector has continuously consolidated the foundation of digital transformation, developed the industrial Internet and basically formed a regional synergy and industry linkage development pattern. The endogenous innovation of China's industry and information technology sector has been increasing and new business formats have been growing with the support of new digital technologies and applications, which effectively improve the quality of the manufacturing industry, cuts its costs, increase its efficiency and promote its green and safe development.

### The digital economy continues to expand



Scale of Digital Economy in China from 2017 to 2021  
unit: Trillion RMB



2021

- More than **700** digital workshops/factories have been built
- 305** intelligent manufacturing pilot demonstration projects and **420** new model application projects have been implemented
- and more than **6,000** system solution suppliers have been cultivated
- The manufacturing industry has accelerated its development towards digitalization, networking and intelligence, cultivating more than **150** large-scale industrial internet platforms and connecting more than **79 million** sets of industrial equipment, the CNC rate for key processes and the penetration rate of digital R&D and design tools for key industrial enterprises in China reached **55.3%** and **74.7%**, respectively, **30.7** and **25.9 percentage points** higher than in 2012, and intelligent manufacturing in some fields topped the world.

### The wide-spread 5G opens up new horizons

As of July 2022

- a total of **1.968** million 5G base stations had been built and opened
- and all prefecture-level cities and county towns in China have been **fully covered** with 5G

- The number of 5G mobile phone users has reached **475** million / with **50,000** cases of 5G applications, / Gigabit optical network is available to more than **400** million households

### Artificial intelligence continues to grow

2021

- The scale of the artificial intelligence core industry in China reached **199.8** billion RMB
- The artificial intelligence sector in China was granted **92,728** patents
- As of 2021, there have been **7,796** AI-related enterprises in China
- The artificial intelligence sector raised a fund of **244.22** billion RMB
- with **821** cases of financing
- The fund raised by the single case of artificial intelligence was nearly **300** million RMB
- up by **17.5** % year-on-year
- Revenue from Internet data services (including wind services, big data services, etc.) was **776.8** billion RMB
- up **21.2%** year-on-year, and an increase of **4.6 percentage points** from the same period last year
- Internet companies with annual revenue of 20 million yuan or more from their main business operations achieved an operating profit of **132** billion RMB
- an increase of **13.3%** year-on-year

02 **Actions**  
*Contributing to  
 Global Sustainable  
 Development*



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The 50 MW thermal energy storage power plant of CCEC DELINHA in Qingdao Province adopts the core technology of tower fused salt optothermal power generation, which is developed independently and fully owned by IPR, and over 95% of the equipment is indigenized.

## Digital Technology Empowerment Development



Sustainable Development Goals



**Digital technology and the economy are opportunities for the world's scientific and technological revolution and industrial reform. Digital technologies are a key force for sustainable development by enabling intelligent upgrading of manufacturing, reorganizing factors and resources, and reshaping the economic structure.**

The Ministry of Industry and Information Technology signed the Agreement on Accelerating the Strategic Cooperation of Central Government-owned Enterprises' Integration and Digital Transformation, which promotes the acceleration of central government-owned enterprises' integration of information technology industrialization and digital transformation, promotes the deep integration of digital technology and the real economy, and plays a leading role in supporting the construction of manufacturing power, network power, digital China and the development of the digital economy. The sector further implements intelligent manufacturing engineering and manufacturing digital transformation actions and 5G application innovation actions and creates an amount of manufacturing digital transformation benchmarking enterprises. Deepen the development of cloud computing, big data, artificial intelligence, and manufacturing integration, and the release of national intelligent manufacturing standards system, to promote intelligent upgrading of manufacturing. Promote industrial digitalization and digital industrialization, and speed up quality change, efficiency change and power change. Vigorously develop intelligent manufacturing, promote the development and application of intelligent manufacturing standards in sub-sectors, and formulate policies and measures for the digital development of equipment. Enhance the supporting capacity of digital transformation of the manufacturing industry, and accelerate the expansion of Internet applications from the consumption field to the production field. E-commerce, telecommuting,

telemedicine, online education, and other Internet applications are fully popularized, the annual transaction scale of mobile payment reached 527 trillion RMB, 5G, industrial Internet, big data, cloud computing, artificial intelligence in industrial manufacturing, ports, mines and other industry sectors to accelerate the application, the total number of application cases exceeded 50,000, new technologies, new business models and active development, empowering thousands of industries and promoting the vigorous development of the digital economy. Improve the multi-level industrial Internet platform system, focus on key industries, and expand the application of "5G+ industrial Internet". The completion of a number of intelligent demonstration factories has been accelerated, making the scale of intelligent manufacturing applications a leading player in the world, while industries such as petroleum engineering, steel and building materials already possess a number of leading enterprises with global manufacturing capacity and intelligence level. Support a complete set of digital rural solutions and digital rural governance information platforms for rural areas to promote the integration application of information technology and agricultural machinery, cultivate emerging information technology products and services for agricultural digital development, promote the deep integration and application of new generation information technology in various links of agriculture and rural areas, and optimize the industrial structure in rural areas so that farmers can share the information dividend brought by the era of the digital economy.



- Huawei Technologies Co., Ltd. and SAIC Motor Corporation Limited (SAIC Motor) build a "fully connected" intelligent factory, making full use of technology such as Big Data and AI, to realize data-driven intelligent manufacturing based on total interconnection, thereby enabling the digital transformation of enterprises.



Scan it to explore SAIC Ningde Intelligent Factory



## Addressing Global Climate Change



Sustainable Development Goals



**It is a common challenge for all mankind to protect the ecological environment and cope with air change. Adhering to the concept of a community with a shared future for mankind, the Chinese government actively participates in global environmental governance, strengthens international cooperation in the fields of climate change, marine pollution control, and biodiversity conservation, and makes solemn commitments to the world on carbon peaking and carbon neutrality.**

To meet new demands and situations, the Ministry of Industry and Information Technology established the vision of carbon peak and carbon neutrality goal, implemented the Plan of Actions for carbon peak before 2030, strengthened the construction of a green low-carbon standard system in industry and information technology, issued the Implementation Plan for Carbon Peak in Industrial Fields, and proposed a 13.5% drop in energy consumption per unit of industrial value added by industries with annual revenue of 20 million yuan or more from their main business operations by 2025 compared to 2020, a drop of more than 18% in carbon second emissions, and a significant drop in carbon emission intensity in key industries. Also, the sector jointly issued the Guidance on Strengthening Industry-Financial Cooperation to Drive Industrial Green Development, which continuously deepens the cooperation between industry

and finance to guide financial resources to support the construction of a modern industrial system with green development mutual promotion and deep integration of industrial and information technology enabling low-carbon transformation. The sector actively promotes the peak-reaching action of key industries, jointly with relevant departments to speed up the release and implementation of the implementation plan for peak carbon dioxide emissions in key industries, implement policies separately and continuously, gradually reduce the intensity of carbon emissions and control the total amount of carbon emissions. The sector vigorously develop new energy industry and promote new energy vehicles on a large scale. The sector strengthens carbon capture and storage technology, zero-carbon industrial process reengineering technology and other scientific and technological research, support the transformation of green low-carbon technological innovation, promotes

the demonstration and application of new industrial low-carbon technologies, new processes, new equipment and new materials, and create a number of zero-carbon factories, zero-carbon parks and zero-carbon supply chains. The sector actively supports the development of green and low-carbon energy in developing countries, makes a number of international production capacity and equipment manufacturing cooperation projects, accelerates the high level of power equipment "going global", promotes global energy production and green low-carbon transformation, the full implementation of the United Nations 2030 Agenda for Sustainable Development, the collaborative response to global climate change, and jointly take the green, low-carbon, sustainable development path.



- Hebei Electric Power Co. Ltd. of State Power Investment of China (SPIC) builds a 258 MW Fisheries & Photovoltaic Power Generation project in Haixing of Cangzhou, to promote clean energy development.

## Drive Inclusive Economic Growth



### Sustainable Development Goals



**Inclusion growth in the economy means a balance between equity and efficiency, i. e., to enhance social balance and development inclusivity for sustainable growth. Now, the external environment tends to be complex, severe, and uncertain so China's economic development is under triple pressure from demand contraction, supply impact and expected degradation. China's industry and information technology industry are committed to improving development in a balanced, coordinated, and inclusive way, and actively promoting inclusive economic growth given the challenges.**



Scan it for a number of measures to reduce the burden and increase vitality to help SMEs solve their difficulties



China's industrial and information technology sector takes promoting high-quality development as the theme, deepening supply-side structural reform as the main thread to accelerate the adjustment of industrial structure and the transformation of development mode, to promote the transformation and upgrading of traditional industries and the development and growth of strategic emerging industries, to improve the long-term mechanism of market-based rule of law to dispel overcapacity, to implement major technological renovation and upgrading projects to enhance new technologies and product development capabilities, and to improve policies and measures to promote industries such as next-generation information technology, biotechnology, new energy, new materials, high-end equipment, green environmental protection, aerospace, and ocean equipment, to improve the quality effectiveness and competitiveness of development, and to support the construction of a new development pattern with services. The sector cultivates high-quality enterprises, optimizes the environment for mergers and acquisitions, supports enterprises to improve the scale and intensive management level through strategic cooperation and cross-sector and cross-regional mergers and acquisitions and cultivate a number of large enterprises with international competitiveness and ecological control. The sector increases policy support



• Production line of special process of surface treatment of Xizi UHC

and public services for SMEs, and cultivates specialized and sophisticated enterprises, "little giants" and individual winners in manufacturing. The sector enables the manufacturing industry to be more attractive to various resource elements, promotes reforms in the finance, taxation, finance and science and technology systems, and strengthens the effective synergy of sci-tech innovation, modern finance, human capital and high-quality development of the manufacturing industry, and further reduce the burden of taxes and expenses on the manufacturing industry. The sector deepens two-way multilateral and regional economic cooperation and actively participates in the setting of international economic and trade rules and standards, so as to promote economic globalization in a direction that is more open, inclusive, balanced and win-win. The sector continues to expand the scope of opening up to the outside world, as well as the expansion of cooperation regions, the improvement of opening levels, the increasing standardization of cooperation channels, and the increase of equity and reciprocity. International cooperation in manufacturing should be deepened and expanded, with the implementation of major foreign-funded projects and service guarantees for key foreign-funded enterprises, to give impetus to global economic recovery and sustainable development.

## Sustainable Consumption and Production



### Sustainable Development Goals



**Sustainable consumption and production mean doing more and better with fewer resources. The sector also means eliminating the link between economic growth and environmental degradation, improving resource efficiency, promoting sustainable lifestyles and transitioning to a low-carbon and green economy.**

In the field of production, China's industry and information technology sector promote the overall conservation, intensive and recycling of resources, speed up the optimization of industrial structure, improve the utilization rate of production capacity, and reduce crude steel output by more than 20 million tons throughout the year. The sector accelerated the expansion of strategic emerging industries and advanced manufacturing

industries, further promoted intelligent manufacturing, developed industrial Internet, and initially built several digital workshops and intelligent factories. Many measures have been taken to vigorously develop a circular economy, increase the utilization of garbage resources, reduce the waste of energy resources, and build a green and low-carbon circular economy system. Measures have been taken to accelerate the pace of green transformation, promote the green transformation of key industries such as the chemical industry, machinery, electronics, household appliances, food, textiles and large-scale complete sets of equipment, implement three batches of 366 key projects, recommend more than 2,000 kinds of advanced energy-saving technologies, equipment and products, and reduce the energy consumption and water consumption of related enterprises to about 60% of the industry average. The sector implements green and low-carbon product supply actions, provides high-quality products and equipment for energy production, transportation, urban and rural construction and other fields, promotes nearly 20,000 kinds of green products, cultivates 153 national green data centers, and gradually builds whole chain green product supply system from basic raw materials to end consumer goods. The sector promotes the recycling of industrial resources and implements standardized management of renewable resources such as waste steel and waste plastics. Nearly 800 backbone enterprises in the comprehensive utilization of renewable resources have been cultivated, and more than 10,000 new energy vehicle

power battery recycling service outlets covering 31 provinces, autonomous regions and municipalities directly under the Central Government have been built, which basically realizes the nearby recycling of retired batteries and improving the sustainable utilization level of resources. The sector focuses on key industries to continuously carry out industrial energy-saving supervision, implement industrial energy-saving diagnostic services, help enterprises explore energy-saving potential, and promote energy conservation, carbon reduction, cost reduction and efficiency increase. The sector guides enterprises to carry out energy saving and carbon reduction, and the green production process encourages enterprises to implement clean energy substitution, and continuously improves green production. The sector expands the network economic space, promotes the integration and development of the Internet and the real economy, plays the role of "Internet plus", stimulates traditional consumption such as textiles, household appliances and automobiles, trains consumption hotspots such as smart and healthy old-age care and green products, and promotes the construction and development of green manufacturing system. In addition, the sector also encourages qualified regions to carry out green smart home appliances going to the countryside and trade-in actions, mobilizes the whole society to participate in low-carbon actions extensively, cultivates sustainable consumption concepts, leads new low-carbon trends, promotes the formation of green production and low-carbon lifestyles, and promotes the development and growth of sustainable consumption and production.



• Shanghai Mdt InfoTech Ltd. (Dewu) held theme activities including "Dewu Chinese Fashion Trend", "Dewu Chinese Fashion Day" and "Sanpin National Tour" (Sanpin means increasing variety, improving quality and creating brand) to spread the Chinese fashion trend to young consumers, continuously bring design empowerment, IP empowerment and traffic empowerment to the Chinese fashion brand, help Chinese products transform into Chinese brands, and promote the fashion trend to go global.

## Building Sustainable Infrastructure



Sustainable Development Goals



As the material basis and basic condition supporting social and economic development, infrastructure construction has a prominent impact on the sustainable development of the environment, economy, and society. The measures of developing sustainable infrastructure are essential to cope with climate change, improve public services and promote global economic recovery.



- State Grid Gansu Electric Power Company actively supports the construction of the “Three Gorges on Land” UHV power channel, to promote the realization of the “Three Carriages” of Harbin-Zhengzhou 800kV HVDC project, Qi-Shao (Jiuquan City-Hunan Province) 800kV HVDC project and Ji-Quan (Changji City-Guquan Town in Anhui Province) 1100 kV HVDC transmission line project, and set up a “highway” for the continuous transmission of power in the air in Hexi New Energy Base of Gansu Province.



- China Telecom Group Co., Ltd., and Sany Heavy Industry Co., Ltd. Built the World's First 5G Fully Connected Factory in the Equipment Manufacturing Industry.

China's industrial and information sector continues to strengthen the construction and application of new digital infrastructure, ensure sustainable economic and social development, and improve governance and efficiency. The digital infrastructure has achieved remarkable progress, with the world's largest and technologically leading network infrastructure being built and exponential growth in access bandwidth of optical fiber network. Digital infrastructure has been strengthened simultaneously, building three major systems of the industrial internet network, platform, and security. The Internet Vehicle direct communication and 5G+Vehicle Networking system continues to accelerate, and the development momentum

of the vehicle networking industry continues to improve. More efforts have been made to launch a special campaign to build big data centers, accelerate the construction of national data center hub nodes, and continuously improve the network security capability, thus making digital life more convenient. The sector enhances the ability of network and data security. As such, the network and data security management system is improving continuously, the industry data security supervision system is initially established, and the new infrastructure security framework system is initially formed. The sector vigorously develops a new generation of construction machinery, grasps the convergence

opportunities brought by new-generation information technologies such as 5G, AI, Big Data and the Internet of Things, and provides strong support for China's new infrastructure construction. The sector actively builds clean and sustainable infrastructure, and the million-kilowatt hydro-generator set with the largest single-unit capacity in the world has been successfully put into operation at Baihetan Hydropower Station. The annual power generation of all units can meet the annual living electricity consumption of about 75 million people. China has built 1100 kV HVDC transmission equipment with the highest voltage level in the world and applied it to the “West-to-East Power Transmission” project from Zhundong-Xinjiang Economic

& Technological Development Zone to Southern Anhui. Moreover, China is the world's largest producer of wind power equipment and the world's largest installed country of wind power, with installed capacity ranging from plain to plateau mountain to offshore high-power wind turbines. The competent departments of industry and information technology regard infrastructure “physical connectivity” as an important direction of opening to the outside world, promoting the high-quality development of the BRI and achieving mutual benefit and win-win results with the countries involved.



## Coordinated Measures to Benefit People's Livelihood



Sustainable Development Goals



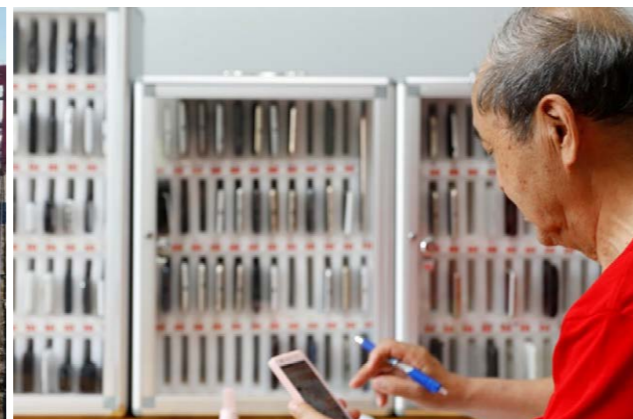
**“The people are the foundation of a country and only when the people lead a good life can the country thrive.” Realizing people’s longing for a better life has always been an essential task of China’s sustainable development. The Chinese government aims to improve the supply quality, improve the information infrastructure, break down information barriers, connect the digital divide, share the development achievements with the people, and lead all the people to embrace a higher quality, better, and more convenient life.**

China’s industry and information technology sector continues to improve the quality of the manufacturing supply system, with over 40% of the world’s 500 major industrial products ranking first in the world in terms of output. High-end products such as smartphones, smart TVs, energy-saving refrigerators, automatic washing machines, variable frequency air conditioners, and automobiles have entered the homes of ordinary people, significantly improving people’s quality of life. Measures have been taken to pay equal attention to the popularization of digital applications and the construction of information infrastructure in rural areas, and to realize “broadband access to villages”, “5G access to counties” and “Gigabit access to cities”. By the end of July 2022, 1.968 million 5G base stations had been built and opened, and all prefecture-level cities, county towns, and 96% of townships had achieved 5G network coverage. The number of 5G mobile phone users reached 475 million, and the “digital divide” between urban and rural areas was greatly narrowed, accelerating the modernization of agriculture and rural areas and helping rural revitalization. For many years, the sector has implemented the special action of speeding up the network and reducing fees. The average end-to-end download rate of fixed broadband and 4G users has increased by 7 times, and the average tariff per unit traffic has dropped by more than 95%, which promotes the vigorous development of new Internet

applications, new formats, and new models, and realizes the large-scale promotion of Internet life services. The sector has continuously improved telecommunications services, organized and implemented universal telecommunications services for eight consecutive years, and continuously strengthened the protection of users’ rights and interests. “Internet plus” is booming, and information consumption continues to expand and upgrade. By the end of 2021, the national online retail sales reached 13.1 trillion yuan, making the digital consumption market the largest in the world. The sector launched a special campaign to adapt to the aging and barrier-free transformation of Internet applications, and the barrier-free level of Internet applications is steadily improving. During Covid-19, more efforts were made to organize and launch the public service of communication travel cards, which comprehensively and efficiently supported internal non-proliferation and external anti-input. At the same time, in the face of the demand for centralized network use such as home life, office work, and online learning during the special period, the network is not blocked with better service and better performance and the needs of orderly production and life under the epidemic situation in novel coronavirus pneumonia were satisfied.



• The “Lianyungang-Erlanhaote-Moscow” China Railway Express is ready to go at the Sino-Kazakhstan Logistics Base in Lianyungang, Jiangsu Province, transporting high-quality small commodities to Europe and sharing the development achievements of Chinese manufacturing.



• Huawei Technologies Co., Ltd. has completed the optimization and upgrading of basic experience to adapt to aging, and improved the barrier-free level of Internet applications.

## Establish Harmonious Labor Relations



Sustainable Development Goals



**Labor Relation is one of the most basic and important social relations in modern society. Since 2006, the relevant departments of the Chinese government, together with trade unions and enterprise associations, have launched activities to create enterprises and industrial parks with harmonious labor relations, including safeguarding the basic rights and interests of employees according to law, improving the coordination mechanism of labor relations, strengthening the democratic management system of enterprises, and improving the mediation mechanism of labor relations contradictions. In 2015, the Chinese government unveiled the Opinions on Building Harmonious Labor Relations, further promoting the establishment of standardized, orderly, fair, reasonable, mutually beneficial, harmonious and stable labor relations, creating decent employment opportunities for all and improving living standards.**

Strictly abiding by the Labor Law of the People’s Republic of China and other national laws and regulations, China’s industry and information technology sector pay attention to harmonious labor relations and talent team building, closely focusing on the talent demand for high-quality development of manufacturing industry, and insist on giving



• Transfer Group Co., Ltd. actively introduces international talents and builds digital supply chain teams in Europe and America.

top priority to the development of human resources, to provide talent for high-quality development of manufacturing industry. China’s industry and information technology sector adheres to gender equality and equal pay for equal work, protects the basic rights and interests of employees according to law, carries out employee recruitment and salary management fairly and impartially, treats employees of different races, genders, and beliefs equally, and put an end to all forms of child labor and forced labor. China’s industry and information technology sector fully protect workers’ social security rights and interests, implement workers’ right to rest and vocation, promote the institutionalization and standardization of factory affairs openness, and create conditions for workers to participate in the democratic management of enterprises. Efforts are made to deepen the integration of production and education, strengthen the training of industry talents, continuously strengthen the training of enterprise management talents, implement the Action Plan for Upgrading Industrial and Information Vocational Skills, and train more than 2.52 million skilled talents in the fields of information technology and intelligent manufacturing. Moreover, an online learning platform for industrial and information technology technical talents is built and operated, with 10149 online courses and over 5.7 million participants. We innovate the construction of industry talent evaluation,

selection, and incentive systems, highlight the performance orientation of moral ability, and open up the career development channel of skilled talents and professional and technical talents. The National Industrial Robot Technology Application Skills Competition and the National Industrial and Information Technology Skills Competition were held, which led more than 10 million employees to participate in various skills competitions at all levels, and more than 1.5 million employees were promoted to skill levels through competitions, striving to support and lead the high-quality development of manufacturing industry with high-level talents. We pay attention to occupational health and safety, provide adequate protective equipment for occupations engaged in high-risk jobs according to national laws and regulations, and timely inform the operating procedures of dangerous posts and the hazards of illegal operations. We guarantee to equip and maintain emergency rescue equipment and equipment in time and carry out emergency drills, to improve employees’ ability to deal with safety accidents. We guide enterprises to attach importance to the construction of corporate culture and improve the cohesion, creativity, and social identity of employees. In addition, we balance the work and life of employees, organize and carry out rich cultural and sports activities, and strive to create a happy, harmonious, positive, and healthy enterprise home.

# 03

## *Innovative Practice of Sustainable Development*



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State Grid Xinjiang Electric Power Co., Ltd. efficiently builds high-quality power grid projects, supports energy development and efficient utilization in western China, and builds sustainable infrastructure.

## Innovative Development

Improving Factor Efficiency



**Further implementing the innovation-driven development strategy and strengthening the foundation of the real economy. We need to promote scientific and technological innovation, upgrade our industries, eliminate the bottlenecks in supply, and realize high-quality development through innovation.**



— REPORT ON THE WORK OF THE GOVERNMENT IN 2022



Innovation is the first driving force to lead the development and strategic support for building a modern economic system. General Secretary Xi Jinping emphasized that the core of the manufacturing industry is innovation, that is, mastering key core technologies.

China's industry and information technology sector has deeply implemented the innovation-driven development strategy, promoted scientific and technological innovation, deeply conducted industrial base reengineering projects, and promoted the upgrading of traditional industries. We promote key core technology research, achieving breakthroughs in manned spaceflight, Mars exploration, resource exploration, energy engineering, and other fields. Efforts are made to strengthen investment in scientific research and increase the intensity of the manufacturing industry from 0.85% in 2012 to 1.54% in 2021. The average R&D intensity of specialized and innovative "Little Giant" enterprises reached 10.3% and more than 570 industrial enterprises were shortlisted among the top 2500 global R&D investments. We improve the construction of scientific and technological innovation systems, focus on increasing the supply of key common technologies, lay out and build 24 national-level manufacturing innovation centers such as power batteries and additive manufacturing, promote the construction of 233 provincial-level manufacturing innovation centers, support the construction

of 125 industrial technology basic public service platforms, and greatly improve the supply capacity of common technologies. We create the first batch of national manufacturing high-quality development pilot zones, strengthen the construction of national laboratories, and promote the implementation of major scientific and technological projects. In addition, we optimize the construction of the standard system and play the role of national technical standard innovation base, to promote technological innovation and standard development, accelerate the transformation of applicable international standards, and actively participate in the formulation and revision of international standards. Guided by innovation, we carry out the action of strengthening and supplementing the chain of key industries, implementing the project of ensuring and stabilizing the chain of leading enterprises and maintaining the safety and stability of the industrial chain and supply chain. We implement the industrial internet innovation and development project, promote the transformation and upgrading of the industrial internet network, improve the multi-level industrial internet platform system, promote the platform to enter parks and enterprises, expand the application of "5G + industrial internet", and support the creation of a national pilot area for vehicle networking. Moreover, we promote the integration and innovation of large, medium, and small enterprises, guide more large enterprises to open their markets to "little giant" enterprises,

support small and medium-sized enterprises to enter the supply chain of leading enterprises and cultivate characteristic industrial clusters of small and medium-sized enterprises. We actively guide the majority of small and medium-sized enterprises and private enterprises to take the development path of "specialty, precision and innovation". By the end of 2021, we have cultivated more than 50,000 "specialty, precision and innovation" small and medium-sized enterprises, 8,997 "little giant" enterprises, and 848 single champion enterprises in the manufacturing industry. We guide high-quality enterprises to benchmark world-class enterprises, accelerate the integration and development of new-generation information technology and manufacturing industry, intensify technological transformation, strengthen the quality brand building, participate in the formulation of international technical specifications and standards, and improve the supply capacity of middle and high end. We pay attention to enhancing the ability of scientific and technological innovation, and the investment intensity of R&D has increased from 0.62% in 2012 to about 1% in 2021. We have strengthened the protection and application of intellectual property rights, with the number of scientific papers and invention patents ranking first in the world, and more than 300 materials and technologies have won national science and technology awards. More measures are taken to actively implement various innovation incentive policies, implement the

project of improving the innovation ability and specialization level of small and medium-sized enterprises, promote cooperation among large, medium, and small enterprises, and foster new kinetic energy. We have improved the system and mechanism of talent development, carried forward the spirit of scientists, and increased support for young researchers, so that all kinds of talents can devote themselves to their research and give full play to their abilities, promote the continuous enhancement of innovation ability in the industrial and information industries, foster new kinetic energy for economic development, and make innovation powerful support for overall economic development and green transformation.

In 2021, China witnessed fruitful innovation in its industrial and digital industries, with the proportion of new product income of industrial enterprises with annual revenue of 20 million yuan or more from their main business operations in business increasing from 11.9% in 2012 to 22.4% in 2021. Reputed as the pillar of the great power, a large number of emerging and prominent landmark innovations as evidenced by the Jiaolong (China's manned deep-sea submersible), Xuelong and Xuelong 2 (polar icebreakers), C919 airplane, Chang'e lunar exploration program, Xihe solar exploration satellite, Beidou Navigation Satellite System, Jiuzhang light-based quantum computer, lead the sustainable development of China's manufacturing industry.

On October 14, 2021, China successfully launched the first solar exploration science and technology test satellite "Xihe", which represents the first solar exploration for China, marking that China officially entered the era of "exploring the sun".

### Tianjin builds China's first provincial carbon peaking and carbon neutrality operation service center with government-business collaboration

On June 24, 2022, led by State Grid Tianjin Electric Power Corporation, China's first provincial carbon peaking and carbon neutrality operation service center with government-business collaboration was established - Tianjin Carbon Peaking and Carbon Neutrality Operation Service Center (hereinafter referred to as the "Center"). The Center gathers strengths of the industry with focus on the low-carbon transformation requirements of energy and power in Tianjin and builds a comprehensive carbon peaking and carbon neutrality operation service system combining one platform, three classes of service recipients, five types of functions, in accordance with the whole idea of platform-based services, market-oriented cooperation, and professional operation. In this way, the Center serves the government to contribute to more scientific macro-control and regulatory decisions, serves the enterprise to help grasp the operation of carbon emissions and the trend changes and serves the energy consumers to facilitate their carbon reduction and efficiency enhancement. Besides, the Center innovatively provides five major functions, including carbon emission reduction management, carbon asset operation, carbon trading management, carbon assessment and verification, and low-carbon technology research. Thus, the Center provides all-round, regional, and whole-process comprehensive carbon peaking and carbon neutrality services for various subjects, such as the government, enterprises, and the public, and innovatively builds open, shared, collaborative, innovative circular connected carbon ecology where win-win cooperation is necessary.



## Coordinated Development

### Upgrade the Structure



**We will promote balanced and coordinated development among regions. We will fully implement all major regional development strategies and the strategy for coordinated regional development.**



— REPORT ON THE WORK OF THE GOVERNMENT IN 2022

At a special moment when the epidemic is exacerbating the world's turbulent changes, China is actively consolidating and expanding its achievements made in poverty eradication, comprehensively furthering rural revitalization, boosting urban-rural complementarity, placing greater importance on achieving common prosperity for all, promoting coordinated regional development and common prosperity, and continuously fostering balanced, coordinated and inclusive development.

The competent departments in charge of Industry and Information Technology adhere to the concept of coordinated development, implement major regional strategies and regional coordinated development strategies, and promote the coordinated development of industries. The departments continue to optimize the regional structures of industries, and the leading role of key regions such as the Beijing-Tianjin-Hebei region, Yangtze River Delta, and Guangdong-Hong Kong-Macao Greater Bay Area is further enhanced. Special actions for the development of advanced manufacturing clusters have been implemented to cultivate a number of national advanced manufacturing clusters in the fields of electronic information, high-end equipment, automobiles, new materials, etc. A number of provincial advanced manufacturing clusters are cultivated to create growth points in the regional economy. The departments promote the orderly transfer of manufacturing industries in China, strengthen the construction of the capacity of central and western China and northeastern China to undertake industrial relocation, enhance the balance of regional development, promote differentiated industrial relocation, drive

central cities and urban clusters to transfer and undertake industries in a better way, and support special areas in developing unique industries. The departments actively make up for the shortcomings, adjust the structure, vigorously transform and upgrade traditional industries, focus on digital, green, high-end development, and support the development of advanced technologies, high-end upgrading and expansion of the supply of quality products in industries such as industrial mother machines, ships, medical equipment and agricultural equipment. In 2021, a total of 445 national demonstration bases for new types of industries and 25 advanced manufacturing clusters were built. The industry value added accounted for more than 30% of the national industry value added, contributing to the increased supply capacity of the manufacturing industry and the resilience of the industry value chain. The departments promote the cooperation of domestic industrial relocation, undertake the relocation of international industries at a high level, build world-class advanced manufacturing clusters, strengthen international cooperation, and support the construction of the "Belt and Road" initiative. The departments support the development of SMEs and build an environment where large and small enterprises are interdependent and mutually facilitate each other's growth. They encourage enterprises to optimize the allocation of production factors such as capital, technology and talents through mergers and acquisitions to achieve excellence and strength, and urge large and small enterprises to strengthen cooperation in collaborative manufacturing and supply chain management to achieve integrated development.

Create a New Space for Entrepreneurship and Innovation to Promote New Industrial Development



Hangzhou Artificial Intelligence Industrial Park, together with its partners, will build a global creator center for artificial intelligence, bring together a wide range of creators and geeks in the intelligent industry represented by artificial intelligence, give full play to the agglomeration effect of entrepreneurship and innovation, and promote the innovative development of small and micro enterprises.



#### Improving the Reading Environment for Rural Children with the Power of Sustainable Public Welfare

There is a lack of reading resources for children in remote villages in China. Therefore, Xinhua Wealth Investment Management Limited (Xinhua Wealth) and China Children and Teenagers' Fund (CCTF) jointly launched the "100 Wellness Libraries Charity Program" to create a sustainable public welfare model linking employees, clients, partners and public participation, and promote the sustainable development of the project.

As of 2021, the preliminary goal of the "100 Wellness Libraries Charity Program" to build 100 Wellness libraries has been successfully completed, covering 22 provinces, cities and autonomous regions across China, including 29 in the "three regions and three prefectures" supported by the State. A total of 700,000 books and over 1,200 bookshelves and reading tables and chairs have been delivered, benefiting nearly 100,000 rural children.

*"The Wellness Library has shown me the way to the future; it is a refueling station for my mind and has enriched my life."*  
—Xie Kaining, a student from Zhongxin School, Wuyun Town, Jiayin County, Yichun, Heilongjiang Province



#### Leverage Strengths of Industrial Agglomeration to Promote the Sustainable Hydrogen Energy Industry

The Lingang New Area of the Shanghai Pilot Free Trade Zone gives full play to the advantages of institutional innovation and accelerates the layout of the hydrogen energy industry, building an international hydrogen energy valley. In September 2021, Cummins Hydrogen Energy China Headquarters landed in Hong Kong. This Fortune 500 project integrating R&D, manufacturing, trade, and supply chain covers the business of hydrogen production equipment stack by electrolysis of water, fuel cell engine, and its core components. At present, more than 20 key enterprises in the upstream and downstream of the hydrogen energy industry value chain have settled in Lingang New Area. The sector takes only 3 to 5 minutes to charge hydrogen to the hydrogen bus in Lingang New Town, and the bus can run 600 kilometers. The hydrogen fuel cell stack for vehicles, independently developed by local enterprises, has passed the 5000-hour life test, boosting the efficient utilization of hydrogen energy in new energy vehicles and promote the sustainable hydrogen energy industry.



## Green Development

### Commitment to Low-carbon Development and Environmental Protection



**We will continue to improve the environment and promoting green and low-carbon development. We will work harder to address pollution and protect and restore ecosystems. We will promote development while also reducing emissions, and ensure greater harmony between humanity and nature.**



— REPORT ON THE WORK OF THE GOVERNMENT IN 2022



Green development is the fundamental strategy to solve eco-environmental problems, an important way to build a high-quality modern economic system, and a must-do to achieve a harmonious symbiosis between man and nature.

China's industrial and information technology sector has carried out President Xi Jinping's thought of ecological civilization and followed a path of prioritizing ecological conservation and green low-carbon development. The government actively implements industrial low-carbon action and green manufacturing projects and releases documents such as the "14th Five-Year Plan for Industrial Green Development" and "Action Plan for Industrial Energy Efficiency Improvement" to accelerate the green and low-carbon transformation and high-quality development of the manufacturing industry. The government has made efforts to optimize the industrial structure and established a long-term mechanism for withdrawing backward production capacity in the steel, electrolytic aluminum, cement and flat glass industries. The iron and steel sector fulfilled the target of 150 million tons of capacity reduction during the 13th Five-Year Plan ahead of schedule. China's industry and information technology sector has promoted the green transformation of the manufacturing

industry, expanded the application of new generation information technology such as artificial intelligence, Internet of Things, cloud computing, digital twin and blockchain in the field of green manufacturing, promoted the high-end, intelligent, and green development of the manufacturing industry, and help the sector move towards the middle and high end of the value chain. The sector has actively promoted the improvement of industrial energy efficiency and water efficiency, and the energy consumption per unit of added value and water consumption per 10,000 yuan of the industrial added value of industries with annual revenue of 20 million yuan or more from their main business operations have been further decreased. The comprehensive energy consumption and water consumption per ton of steel and the comprehensive AC power consumption of raw aluminum of key large and medium-sized enterprises have reached the world's advanced level, promoting the efficiency of resources and energy utilization in the sector. A green manufacturing system has been initially formed, and a number of green manufacturing models have been created to drive the promotion and application of green technologies and the coordinated transformation of the industrial supply chain. The green design of industrial products has been promoted. In 2021, a total of 662

green factories, 52 green industrial parks and 107 green supply chain enterprises were built, and 989 kinds of green products were promoted, leading the green and low-carbon transformation of the sector. The development of new energy and clean energy has been accelerated. The sector has developed photovoltaic energy, silicon energy, hydrogen energy and renewable energy. The promotion of new energy vehicles has been strengthened, saving more than 15 million tons of fuel in 2021. The sector has strengthened global green cooperation so that everyone can share the fruits of green development.

Green manufacturing enterprises are encouraged to release reports on green and low-carbon development, and share advanced technologies and model practices of green manufacturing, thus promoting the green and low-carbon transformation of manufacturing industries and guiding high-quality industrial development. National Energy Conservation Awareness Week and other platforms are fully utilized, and multiple forms of energy conservation and environmental protection publicity and education are carried out to promote the adoption of low-carbon production and lifestyle.



Scan to watch the 14,500 heliostats "chasing the light" to generate electricity



State Grid Xinjiang Electric Power Co., Ltd. actively serves the large-scale development and utilization of new energy, and makes every effort to do a good job in supporting construction, grid connection and other services. In September 2021, the molten salt tower thermal power station in Naomaohu Town, Yiwu County, Hami, Xinjiang Uygur Autonomous Region, entered the grid-connected power generation period and is expected to provide 198 million kWh of clean electricity annually.

#### Building an Energy Ecosystem in the Desert to Boost Eco-sustainability

State Grid Gansu Electric Power has promoted the construction of a project to build a desert energy ecosystem that is led by the government, invested by enterprises and participated by farmers. The government provides grid enterprises with information on users' energy needs and the planning of land resources in sandy areas. Grid enterprises are responsible for carrying out data integration and resource matching, providing energy consumption analysis for new energy enterprises, helping the platform align with the electricity market, carbon market and energy service market, and supporting the platform in developing new energy based on resources in the desert.

At the same time, the platform brings in a three-dimensional ecosystem of "power generation on the solar panels, grass cultivation under the panels and breeding between the panels", creating a brand that promotes pollution-free farm produce, healthy food, organic produce and source of production for farmers, and establishes a pool of labor resources in the sandy areas to create new jobs, boosts the cultural tourism industry, stimulates new momentum in the ecological development of the industrial chain in the sandy areas, makes it possible to conduct desertification control through photovoltaics, promote production through power generation, and reduce carbon through clean energy, thus building a green ecosystem for sustainable development.



## Inclusive Development

Enhancing Internal Momentum for Development



**Pursuing higher-standard opening up and promoting stable growth of foreign trade and investment. We will make full use of international and domestic markets and resources, continue to expand international economic cooperation and trade, and push for in-depth reform and high-quality development by promoting high-standard opening up.**



— REPORT ON THE WORK OF THE GOVERNMENT IN 2022

China's industry and information technology sector upholds the concept of inclusive development, enhances the high-level openness of the manufacturing industry, and builds an open and inclusive development environment. The sector maintains the importance of both importing and going global, makes efficient use of global resources and markets with high-level two-way investment, improves the mechanism for securing the supply chain, and promotes inclusive and sustainable industry.

Industry management and open cooperation have been deepened to promote the all-around opening up of the manufacturing industry. The sector eased restrictions on the share ratio and the number of auto enterprises in stages, and orderly expanded the opening of the telecommunications sector. The sector has perfected the system of serving foreign investment, fully implemented the management system of pre-entry national treatment plus negative list for foreign investment, supported foreign capital in increasing investment in China, encouraged foreign capital to invest in advanced manufacturing, high-tech and other fields, and used the "through train" arrangement, "green channel" and other ministerial and provincial mechanisms to fully support the

implementation of key foreign-investment projects. The functions of agglomeration of an open economy are strengthened. Each pilot free trade zone accelerated the gathering of high-quality elements and resources and deepened the development of competitive industries. The Shanghai Pilot Free Trade Zone and the new Lingang Area have accelerated high-quality development. The rights and interests of enterprises are protected, and a first-class business environment that is market-oriented, law-based and international is created. The sector has strengthened international cooperation, focused on improving the resilience and security of the industry value chain, jointly maintained the stable smooth global industry value chain and supply chain, and promoted global industry towards a new stage of balanced, coordinated and inclusive development. The sector focuses on the development of international markets and technological cooperation and builds a platform for foreign exchange and cooperation. The sector has set up 14 cooperative zones for Chinese and foreign enterprises across the country, gathering global technology, talents, capital and other factors to enhance the international competitiveness of enterprises. The sector has steadily promoted the construction of overseas service systems for enterprises, set up

the first Chinese SME center in Germany, and made an active effort to find a more effective mode of construction of overseas centers for enterprises to expand the scope of influence on the development and provide diversified services. International conferences such as the World Robot Conference and the World Conference on Clean Energy Equipment were held. The sector is deeply engaged in various platforms such as China International Import Expo and China International Fair for Trade in Services. The sector has established and cultivated diverse partnerships among governments, international organizations, business associations and enterprises to share market opportunities with the world and promote world economic recovery. The sector promotes multi-bilateral exchanges with the United Nations, the European Union and related countries, deepens the "Belt and Road" cooperation, integrates deeply into the global industry value chain, supply chain and innovation chain, and accelerates the construction of a mutually beneficial global industrial chain and participates in the division of labor and cooperation in the supply chain.

ZTE Corporation builds a new generation of 5G technology-based automated port production and operation system, realizing a comprehensive upgrade of port information technology, providing a model of sustainable operation for the port industry to carry out 5G applications, and enhancing the internal momentum for open development.

### Building the "Cyber Silk Road" Through Cross-border E-commerce

The Pilot Free Trade Zone in Henan Province explores e-commerce services for cross-border trade by leveraging its advantages in transportation and logistics. With the help of intelligent logistics systems and digital customs clearance procedures, imported goods are packed through automatic sorting machines and delivered to thousands of households along the "Cyber Silk Road". Henan's Pilot Free Trade Zone is the first to create cross-border e-commerce 1210 online bonded import model. The business process under this model is simple and convenient. Henan has explored and developed a cross-border e-commerce O2O retail business model. The rapid development of cross-border e-commerce has become an important measure to transform Henan's foreign trade, drive opening up, facilitate innovation, and foster new impetus for economic development. The sector has added new impetus to accelerate the construction of the new development paradigm featuring dual circulation, in which domestic and overseas markets reinforce each other and integrate themselves into the construction of the "Belt and Road" initiative. In May 2021, Henan Province was approved to carry out the pilot project of cross-border e-commerce retail import of drugs, and six pharmaceutical enterprises with an annual turnover of more than 1 billion yuan, including Huide Pharmaceutical and LH-Medicine, have started their own businesses here.



## Shared Development

### Improving People's Livelihood



**We must act on the people-centered development philosophy and rely on the efforts of everyone to promote prosperity for all, so as to keep realizing the people's aspirations for a better life.**



— REPORT ON THE WORK OF THE GOVERNMENT IN 2022

Promoting the common prosperity of all is the focus of working for the happiness of the people. Only by comprehensively improving the material and spiritual life of the people can we improve total factor productivity and solidify the foundation for high-quality development.

China's industry and information technology sector regards the improvement of people's livelihood as the fundamental purpose of high-quality development, serves and improves people's livelihood in the process of development, and actively strives to provide people with more diverse, more convenient, more inclusive and more reassuring industrial and information services. The sector adheres to the people-centered development philosophy, expands the production and supply of medium- and high-end products, increases variety, improves quality and creates well-known consumer goods, and carries out pilot projects to build regional brands in 109 industrial clusters. Product quality has been significantly improved, and the international consistency of key consumer goods standards has reached 95%. Chinese brands have accelerated their rise to the international market. The sector continuously enhances the industrial scale and comprehensive strength of consumer goods. The advantages of the industrial system are consolidated. The development of China's manufacturing industry has strongly improved the quality of people's lives: energy-saving and intelligent

home appliances have become popular across the board, cars are rapidly reaching ordinary people, and the number of cars per 1,000 people has increased from 89 in 2012 to 208 in 2021. The sector continues to improve the level of information technology services and has built the world's largest information and communication network. The gigabit optical network already has the capacity to cover more than 400 million households. The communications sector has been promoting universal service, breaking the information barriers in remote areas and setting up "information highways". The Internet sector is booming, with 2.32 million APPs serving thousands of industries, meeting and enriching users' needs for consumption,

entertainment, social interaction and travel. The government encourages the development of new e-commerce platforms such as social e-commerce, live e-commerce and short video e-commerce for agriculture and rural areas, and promotes the extension of digital and industrialized resources to rural areas, making full use of information technology to help solve the issues relating to agriculture, rural areas and farmers. The scenarios of information consumption in smart agriculture are enriched to create a new model of rural information consumption. In this way, we can solidly promote common prosperity and continuously realize people's aspirations for a better life.



On June 25, 2021, Lhasa-Nyingchi Railway, the first electrified railway in Tibet, was completed and opened. The CR train expanded its presence to 31 provinces, districts, and cities, which reinvigorates the economy of eastern Tibet.



#### Haier Biomedical's zero-carbon technology benefits global health

According to Tracking SDG7 - The Energy Progress Report 2022, there are still 733 million people worldwide still have no access to electricity. Africa remains the country with the lowest electrification where 568 million people have no access to electricity. They are struggling to secure basic immune protection because of the power shortage. Thus, the development and utilization of solar energy and other renewable resources can effectively address those problems. Based on its technological advantages in the aviation field, Qingdao Haier Biomedical Co., Ltd. innovated and developed the solar-drive refrigeration system. Its patented technologies, such as combined constant-temperature equipment and control approaches for cold and heat storage, broke up the technological monopoly which dominated by other countries. Thanks to two core technologies of an efficient and high-density immersive ice storage module and combined phase-change energy storage module, this technology can directly cause cold storage driven by solar, with no need for batteries. It is committed to providing solutions to insufficient basic immunization in underdeveloped regions, increasing the global coverage of basic immunization, and promoting global health accessibility. Currently, solar-powered vaccine refrigerator produced by Haier Biomedical has been available among 78 countries and regions along the "Belt and Road". Its relevant technologies serve 45 million age-appropriate children every year, increasing immunization coverage in low-income countries from 30% in 2015 to 57%, and saving 6.9 million children from diseases with vaccines.



#### New Technology Empowers Information Sharing and System Interconnection Helps Agricultural Loans

Traditional credit processing efficiency is low and customer experience is bad. The Bank of Chongqing has developed "Enterprise Loan for Rural Development". Based on robotic process automation (RPA) technology and electronic depository technology, the sector has developed customer information entry automation and electronic evidence encapsulation and extraction functions, and interconnects with Chongqing Agricultural Finance Guarantee Group Co., Ltd. system through a dedicated line to transmit business data in real time, realizing safe, stable, intelligent and convenient credit services. By the end of September 2022, more than 1 billion yuan and 3,000 loan funds have been invested to promote the development of rural industries and help rural revitalization. The project has been approved by seven ministries and commissions, including the People's Bank of China, the Ministry of Agriculture and Rural Development, and the Ministry of Industry and Information Technology, as the "Chongqing Fin-Tech Enabled Rural Revitalization Demonstration Project".



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## Future Prospects

In the era of unprecedented changes and the coexistence of opportunities and challenges brought about by epidemic, digital change and green transformation, in order to promote the steady and high-quality development of the industry and information technology sector, China's industry and information technology sector uphold the people-centered concept, fully implement the new development philosophy of innovation, coordination, green, open and sharing, build a new development pattern of the industry and information technology sector with Chinese characteristics, and continuously enhance the sustainable core competitiveness of the sector.

**The sector should strengthen its supporting role of the sector,** grasp the opportunity to expand domestic demand, focus on expanding the effective investment for industry, make efforts to improve the quality and resilience of the manufacturing supply system, optimize the business environment, and fully stimulate the vitality and creativity of market players. The sector needs to promote the implementation of programs for high-quality industrial development, to clear the jams in the supply of key products and effectively facilitate the industrial economic cycle. The sector must deepen the integration of industrial capital and financial capital, focus on boosting manufacturing investment, and do a good job in providing services for major foreign-investment projects.

**The sector needs to make breakthroughs in basic and key areas,** improve the modernization of the supply chain, implement the project to rebuild the industrial base and promote the strengthening of the manufacturing chain. The sector needs to create a number of national manufacturing innovation centers and innovation centers jointly built by the state and local governments and cultivate a number of national advanced manufacturing clusters.

**The sector needs to promote the development of specialized and sophisticated enterprises,** optimize the business environment, and coordinate the implementation of a series of policies to benefit them. The sector must implement projects to improve corporate management, promote the upgrade of quality and management of the manufacturing industry, and improve product reliability. The sector needs to promote the integrated development of small, medium and

large enterprises, and form an integrated environment where innovation synergy, production capacity sharing and supply chain interoperability can be achieved, thus driving industrial innovation and improving manufacturing and service capabilities.

**The sector must uphold the inclusive application of technologies,** carry out the construction of 5G and gigabit optical networks in a steady and orderly manner, increase the innovation and promotion of IPv6 applications, and accelerate the integration of 5G applications in vertical industries. The sector need to crack down on illegal APPs, improve the safety and security of Internet of Vehicles and intelligent network-connected vehicles, and increase the use of radio spectrum resources.

**The sector will promote the in-depth development of digital transformation,** enhance the new advantages and new dynamics of industrial development, promote digital industrialization and industrial digitization, and improve the multi-level industrial Internet platform system. The sector will make breakthroughs in a number of intelligent components and equipment manufacturing, expand the application scenarios of industrial big data, promote the digitization, networking and intelligence of the manufacturing industry, and inject strong momentum into industrial development.

**The sector will promote the green and low-carbon transformation of industry,** make deep adjustments to industrial structure, promote energy conservation and carbon reduction, actively implement green manufacturing, vigorously develop the circular economy, accelerate the transformation of green and low-carbon technologies and deepen the integration of digital, intelligent and green technologies,

and run through all aspects of industrial production and the whole process with the vision of carbon peaking and carbon neutral goals.

**The sector needs to accelerate the convergence of China's economy with the global economy, coordinate domestic and international development in a comprehensive manner, and further relax restrictions in manufacturing and other areas.** The sector needs to carry out a series of activities for cooperation in international industrial investment and build a platform for communication and exchange between foreign-funded enterprises and local communities. The sector will implement good measures to stabilize foreign trade, consolidate and enhance the role of export credit insurance, and ensure that foreign trade credit is well placed. Relying on national logistics hubs, the sector will expand international transport routes by sea, air, and rail, promote the construction of an international logistics network that supports "global procurement, production and sales", and reduce costs and increase efficiency in international logistics. The sector will assist in the registration of overseas trademarks and the international promotion of brands to enhance brand influence.

The sector will continue to encourage Chinese enterprises to participate in the international division of labor, enhance the ability to allocate global resources and climb to the top of the value chain and create a more open, more resilient, more dynamic global industrial and information-based economic system. Let's make unremitting efforts to implement the UN 2030 Agenda for Sustainable Development and jointly build a community with a shared future for mankind!