Machinery Industry Speeds Up Digital Reform

Policy Express

By LIN Yuchen

A new comprehensive roadmap for China's machinery industry emphasizes upgrading production capabilities as well as the integration of digital technologies into the entire industrial chain, setting clear objectives and phased timelines till 2030.

Released by the Ministry of Industry and Information Technology and several other departments, the plan is a decisive step in advancing industrial modernization.

Four major initiatives lie at its core: intelligent equipment innovation and development, intelligent manufacturing expansion and popularization, smart services expansion and enhancement, and foundation support strengthening.

These initiatives are backed by 12 tasks, including R&D of common technologies and key components, accelerating the digital transformation of enterprises, enhancing equipment service functions, and improving the digital transformation standard system.


A robotic arm picks up industrial components. (PHOTO: XINHUA)

By 2027, digital and intelligent technologies will be widely applied across various stages of product R&D and design, manufacturing, operations management, and maintenance services. Fifty percent of enterprises will have level two smart manufacturing capability or above and at least 200 outstanding smart factories will be established.

By 2030, most large-scale mechanical industry enterprises will have completed a round of digital transformation. Key enterprises will achieve data interconnectivity and collaborative sharing across their supply chains. Sixty percent of enterprises will have level two smart manufacturing capability or above and at least 500 outstanding smart factories will be established.

The plan's scope reflects the broader context of China's economic strategy. Digital transformation is not merely a technological upgrade but an essential pathway to industrial resilience, efficiency and sustainability. This aligns with the national goals to move up the global value chain and develop homegrown innovation ecosystems.

The inclusion of collaborative mechanisms — linking enterprises, research institutions, and technology providers — underscores the plans systemic approach. By building cross-sector partnerships and open innovation platforms, it aims to break down long-standing silos in the machinery industry, accelerating knowledge transfer and commercialization.

In international terms, the plan calls for further global cooperation. By strengthening exchanges with relevant countries, regions, and international organizations, the global presence of Chinese intelligent equipment, supporting services and related standards will increase.

In addition, the plan will support multinational corporations in building high-level smart factories, R&D centers and other facilities in China, to jointly build a resilient global production network.

Beijing Releases Policy for AI-powered Research

By Staff Reporters

As Beijing gears up to become a global hub for AI innovation and industrial development, it has released a three-year roadmap to foster an open-source, competitive ecosystem that can support the growth of a world-class AI-driven science industry cluster.

Participants visit a booth at the Force Original Power Conference held by ByteDance's Volcano Engine in Beijing. (PHOTO: VCG)

The Action Plan for Accelerating High-Quality Development of AI for Science in Beijing (2025—2027) is China's first local policy dedicated to "AI for Science."

It was jointly released by Beijing Municipal Science and Technology Commission, Administrative Committee of Zhongguancun Science Park, Beijing Municipal Commission of Development and Reform Commission, and Beijing Municipal Bureau of Economy and Information Technology, together with the Haidian District Government.

The action plan emphasizes cutting-edge R&D and the integration of AI into scientific disciplines. It introduces 17 targeted tasks across four priority areas: key technology breakthroughs, infrastructure development, practical applications, and the creation of an open innovation ecosystem.

By 2027, Beijing aims to develop scientific foundation models, establish at least 10 high-quality scientific databases serving over 10 million users, and enable AI applications in no fewer than five major scientific fields.

It also plans to produce over eight exemplary application cases, build a common service platform, and nurture interdisciplinary talent. A multi-channel financing and investment service system will be built while international collaboration will be promoted.

Beijing has been advancing AI for Science as a strategic pillar of its AI development. In 2021, the city established the AI for Science Institute, the first Chinese research institution focusing entirely on AI for Science. Since then, it has delivered a series of landmark achievements, including the Deep Potential Atom model — covering over 90 chemical elements, and the Bohrium Space Station, an AI-powered research cloud platform that integrates literature review, computing, lab experimentation, and interdisciplinary collaboration.

For effective implementation of the plan, Beijing will introduce additional targeted policies in areas such as AI + new materials and AI + medicare. These measures will promote coordinated resource allocation and reinforce strategic momentum across key sectors.

Along with this, a dedicated task force for AI for Science will be established. The team will oversee major projects in core technologies, infrastructure, and applied research, while encouraging joint innovation among ecosystem stakeholders.

Luo Peilin: Pioneering Scientist Who Transformed China's Telecoms

80 Years On
Salute to Scientists

By LIANG Yilian & WANG Yuhan

In the dim glow of a kerosene lamp in a cave dwelling in Yan'an, a young engineer substituted lard for lubricant, and carved insulators from wild pear wood. With these and other makeshift materials, he built over 60 radio transmitters and delivered them to the front lines of the Chinese People's War of Resistance Against Japanese Aggression. The year was 1937. Wang Zheng, then head of the Third Bureau of the Central Military Commission, once quipped: "With Engineer Luo, we're no longer just the 'barefoot Eighth Route Army.'"

The man behind this communications revolution was Luo Peilin, a former instructor at the Central Military Commission Radio School — the predecessor of Xidian University — and later honored as a "red scientist."

Through wartime hardships and the early struggles of the People's Republic of China, he demonstrated unshakable conviction and exceptional talent, laying the foundation for China's electronics industry. He lived by the pledge: "Whatever the country needs me to do, I will do."

A mission to Yan'an

Born in December 1913 in Tianjin to a scholarly family, Luo was introduced to the world of telecommunications at an early age. His father, Luo Chaohan, was the founder of a telegraph school and served as director of the Beijing Telephone Bureau. At Nankai High School, Luo developed a fascination with radio technology and went on to study electrical engineering at Shanghai Jiao Tong University.

In 1933, Luo met Qian Xuesen, an aerospace engineer widely recognized as the father of China's missile and space programme. Deeply influenced by him, Luo devoured every book on telecommunications and taught himself modern physics, significantly elevating his expertise. Two years later, he received a job offer from China Radio Company.

But the tides of war changed everything. In 1937, after hearing the gunfire from the Lugou Bridge Incident, Luo couldn't shake the images of frontline soldiers dying due to communication breakdowns.

That same year, the Eighth Route Army's office in Xi'an received a letter from a volunteer. It read: "I have radio expertise and am willing to contribute to the resistance." It was signed by Luo Peilin.

In early spring 1938, Luo arrived in Yan'an, carrying a rattan case full of radio books. With his extensive technical knowledge, he helped found a communication materials factory in Yan'an and trained a batch of communication technicians.

Despite limited tools and materials — just one hand-cranked lathe, a planer, a drill press and a few vises — Luo devised ingenious solutions: using lard instead of machine oil and wood for insulation. He built over 60 radios, pioneering the use of band switches.

These pieces of equipment played an important role on the battlefield, making up for the shortcomings of the Chinese army in radio communication.

A lifelong commitment

In 1939, Luo was sent to Chongqing. He helped found an electrical machinery factory and helped establish an association for progressive young scientists and technicians, serving as an officer. The group united more than 100 progressive scientists and upheld the ideals of unity, resistance and progress.

In 1947, Luo was sent to the U.S. for further studies. With Qian Xuesen's recommendation, Luo was admitted to the Ph.D. program of California Institute of Technology. He completed his coursework and dissertation in under two years. In 1950, he rejected a lucrative offer from his advisor and returned to China.

Back home, Luo led the creation of China's first large-scale electronics plant — the North China Radio Equipment Factory — supporting key projects. He contributed to China's first long-term science and technology development plan (1956 - 1967), directed the development of the country's first ultra-long-range radar, and guided the development of the first domestic computer. From 1982 onward, he repeatedly proposed establishing the Chinese Academy of Engineering.

In April 2011, at the age of 98, Luo passed away. He sought no fame, yet left an indelible legacy in China's electronic and industrial development.

Case Study

Guangdong Targets Offshore Wind Development

By LIANG Yilian & YE Qing

To close the gap in domestic high-capacity wind turbine testing and support its new energy sector, China Southern Power Grid's Guangdong Power Grid Company began construction of the country's first nearshore wind power testing base in 2022. Designed as a public certification and testing platform for large-scale offshore turbines, the facility now has two test turbines ready with the test capacity up to 24 megawatts for a single turbine, which is among the highest globally.

Guangdong has led China in marine economic output for 30 consecutive years, surpassing two trillion RMB in 2024, with offshore wind being a key driver in this success. As of this June, Guangdong's installed capacity reached 12.51 million kilowatts, ranking first nationwide. One in every three offshore turbines in China is made in Guangdong.

Expanding projects, boosting capacity

In Shantou's Nan'ao Island, rows of turbines power Guangdong's energy transition. Developed by Datang Shantou New Energy Co., Ltd., the Nan'ao Lemeng I wind farm began operating in 2021 and has generated about 2.8 billion kWh. Its expansion has now been fully connected to the grid, becoming Shantou's third offshore wind project.

"This is our largest single-turbine capacity project. It's the first in eastern Guangdong to deploy 13 MW turbines at scale and to introduce 16 MW turbines," said Lou Shujun, the executive director of Datang Shantou New Energy Co., Ltd. According to Lou, the site also integrates marine ranching, with structures that can withstand typhoons up to Level 16.

In Yangjiang, Guangdong province, China's first integrated land-sea flexible DC transmission project is underway. Scheduled for completion in 2026, the Sanshan Island project will deliver six billion kWh of clean energy annually to the Guangdong-Hong Kong-Macao Greater Bay Area through a "deep-sea power expressway."

Guangdong's offshore wind industry now spans the full chain — R&D, manufacturing, installation and maintenance. Since the 14th Five-Year Plan began, the province has added over one million kilowatts grid-connected capacity for four consecutive years, with total installed capacity surpassing 12.5 million kilowatts. Major industry hubs are already operational.

Though Guangdong was a late starter in the marine economy, its long coastline, abundant resources and continuous innovation give it strong potential, Lou said.

Advancing innovation, targeting deep seas

Offshore wind in Guangdong is extending into deeper waters with global firsts such as the "Haiyou Guanlan" floating turbine, and the world's first dual-rotor floating energy island.

A key development is the dual-rotor floating platform by Mingyang Smart Energy Group, which mounts two 8.3 MW turbines and operates over 70 km offshore. "We've built a full innovation chain — from research to application," said Zhang Chuanwei, chairman of Mingyang Smart Energy Group. Their platform uses AI systems, smart monitoring, and forecasting tools to reduce costs and improve efficiency in deep-sea deployment.

Guangdong now hosts over 100 marine-related R&D labs and centers. Key technologies in deep-sea science and marine ecology have advanced rapidly. Both Mingyang Smart Energy Group's floating turbine technology and Guangdong Hydropower's offshore construction capabilities meet international standards.

Guangdong's offshore wind growth is underpinned by strong policy support. A 2018 development plan outlined large-scale offshore wind expansion through to 2030. Follow-up policies supported orderly development, deep-sea innovation, and supply chain improvement.

The Regulations of Guangdong Province on Promoting High-Quality Development of Marine Economy, in effect since July 2025, encourages deeper-sea projects, floating turbine technology, and base construction. The 2025 Action Plan for Building a Modern Industrial System in Guangdong Province further promotes the differentiated growth of offshore wind hubs in cities like Shantou and Yangjiang.

Shantou's International Wind Power Innovation Port, built by provincial and local governments, is now a national hub. An integrated industrial park is in operation, attracting top domestic companies, while a 40 MW-class experimental platform is under construction.


The offshore wind power equipment manufacturing industrial park in Shantou, Guangdong province. (PHOTO: VCG)

Tech Empowers Resilient City Development

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After disasters, AI can help analyze the recovery priority for damaged areas and optimize resource allocation to ensure orderly reconstruction with higher speed and quality.

The deep integration of urban information models and digital twin technology will become a key engine for improving urban resilience, Chai said. By real-time simulation and disaster evolution deduction, this technological combination can assist decision making and resource dispatch, effectively supporting the overall arrangement of resilient facilities, quick response and precise measure implementation under extreme events.

The interdisciplinary innovation and integrated application of these technologies will reshape urban risk prevention and control systems, forming a new closed-loop model of "full-domain sensing, smart forecasting, precise decision making and efficient execution," Wang said.

She added that this would drive cities to change from negative defense to active adaption, from partial governance to systematic enhancement of resilience, and realize safe, low-carbon and livable sustainable development goals.