BEA東亞銀行

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Economic Special Report

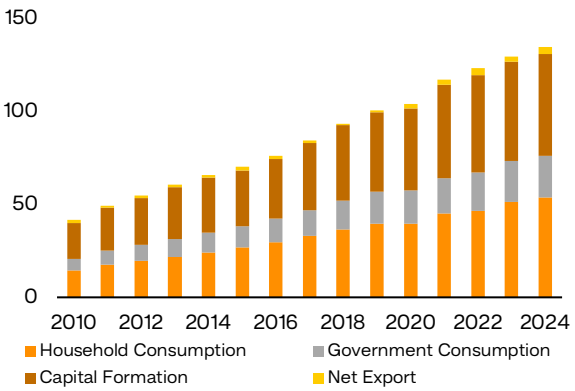
Chinese Mainland On Track to Transition into a Technology-Driven Economy

- Intensified R&D activity, robust digital & green infrastructure, an expanding talent pool, and targeted policies are accelerating high-tech industrial development.
- The strategic pivot toward high-tech transformation has driven significant industrial value-chain upgrades, securing global competitiveness in advanced sectors.
- Over the medium-to-long term, the Chinese Mainland is well-positioned to cultivate a diversified and mature high-tech and green ecosystem.

The pursuit of high-quality development

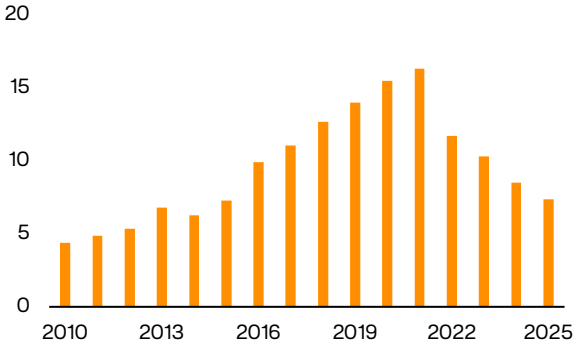
The Chinese Mainland is undergoing a structural evolution from "high-speed" growth to "high-quality" development. Over the past several decades, the economy achieved rapid expansion, becoming the world's 2nd largest economy by 2010. From 2011 to 2020, the Chinese Mainland sustained a strong annual growth rate of 6.8%, driven largely by capital investment and the real estate sector. During this period, gross fixed capital formation accounted for over 40% of national gross domestic product (GDP), while newly-built residential property sales grew at a solid annual rate of 13.4%. However, this debt-fuelled investment and property-reliant model raised concerns regarding growth sustainability and local government finances. Consequently, the authorities articulated a strategic transition into a new stage of "high-quality development", calling for a fundamental transformation of the growth model to foster new and sustainable growth drivers.

Chinese Mainland GDP (RMB Trillion)



Source: National Bureau of Statistics

Newly-built Residential Property Sales (RMB Trillion)



Source: National Bureau of Statistics

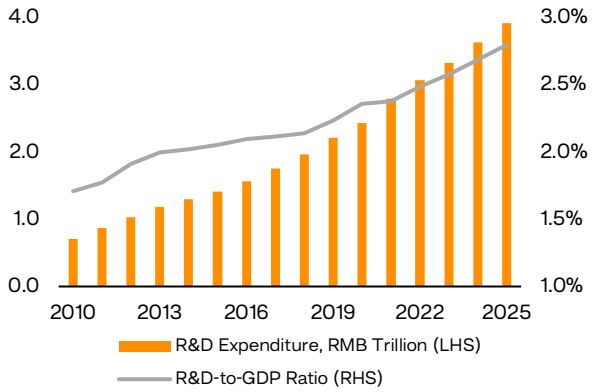
Technological innovation is now prioritised as an important pillar of economic growth. The 14th Five-Year Plan (FYP) (2021-2025) placed significant emphasis on the crucial role of innovation in the national modernisation drive. Achieving self-reliance in technology has been considered as strategically vital, with a sharp focus on breakthroughs in frontier science and technology (sci-tech) alongside enhancing the innovation capability of enterprises. Traditional manufacturing sectors are being guided toward smart, green and digital transformation, while strategic emerging sectors provide fresh impetus for industrial development. Furthermore, the 14th FYP stipulated a number of goals in 2021-2025, including an annual R&D expenditures growth rate of 7%, elevating value-added of core digital industries to 10% of GDP by 2025, and ensuring labour productivity to outpace overall GDP growth. These initiatives underscored the authorities' commitment to moving the economy up the value chain and fortifying the resilience of domestic industrial supply chains.

R&D, infrastructure, talent and policy incentives drove high-tech development

Elevated R&D intensity has established a solid foundation for sci-tech innovation. Between 2011 and 2025, the Chinese Mainland's R&D expenditure expanded at an annual rate of 12.1%, reaching RMB 3.9 trillion. Consequently, the R&D-to-GDP ratio rose from 1.78% in 2011 to 2.80% in 2025, setting it on a trajectory to outpace the OECD average. This intensity is reflected in the World Intellectual Property Organisation's global rankings, where the Chinese Mainland has maintained the top position in patent applications since 2011, registering 1.8 million filings in 2024, notably higher than the US (0.6 million), Japan (0.3 million) and South Korea (0.2 million).

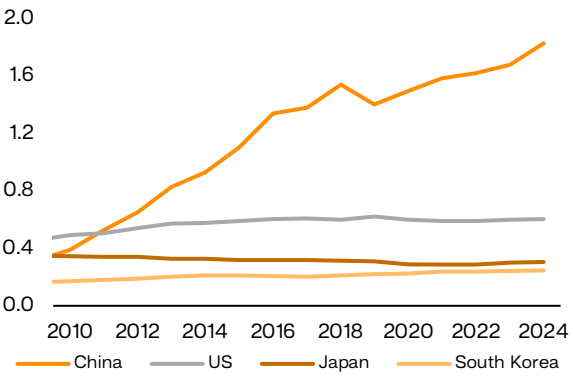
Digital and green infrastructure is rapidly scaling to meet emerging high-tech industrial demands. During the 14th FYP period, the Chinese Mainland proactively developed technology infrastructure to support sectors ranging from next-generation telecommunications, cloud computing to electric vehicles (EVs). The rapid rollout of internet facilities has granted the nation the world's second largest computing power, including 5G base stations (growing from 1.4 million in 2021 to 4.8 million in 2025) and data centres (expanding from 5.2 million units of standard operating racks in 2021 to 12.5 million units in September 2025). Moreover, EVs have secured a market share of over 50% in domestic automobile sales, supported by a surging network of EV charging stations (from 2.6 million units in 2021 to 20 million units in 2025). Overall, this digital and green infrastructure has supported a wider application of advanced technology, unleashing new growth potential.

R&D Activity



Source: National Bureau of Statistics

Patent Application (Million Filings)

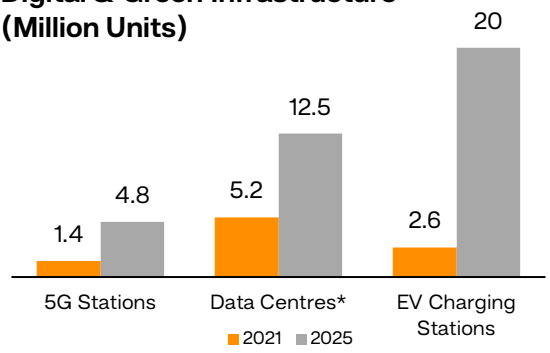


Source: World Intellectual Property Organisation

An expanding skilled labour force is aligning with the needs of industrial upgrading. Human capital plays an important role in the Chinese Mainland's pursuit of technological advancement**.** The number of university graduates has exceeded 10 million annually since 2022, featuring a notable share of science, technology, engineering and mathematics (STEM) graduates. Moreover, the Chinese Mainland has vigorously nurtured top-tier talent in artificial intelligence (AI). According to the Paulson Institute, a US think tank, 28% of the world's top-tier AI researchers worked in China as of 2022, up from 11% in 2019, while the comparable share in the US declined from 59% to 42%. This trend underscored a narrowing AI talent gap. With an expanding sci-tech talent pool, the Chinese Mainland is well-equipped to advance its transition toward high-value-added activities.

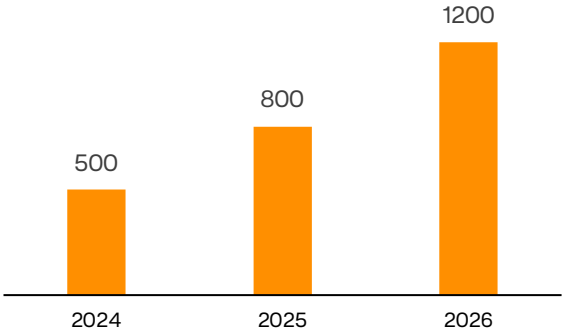
Targeted policy measures are effectively channelling resources into sci-tech sectors. The Mainland authorities have introduced a comprehensive suite of policies to promote technological innovation and productivity upgrades. On the monetary policy front, the People's Bank of China established a relending programme for technology innovation and technical transformation, with quotas rising from RMB 500 billion in 2024 to 800 billion in 2025 and reaching 1.2 trillion in 2026. This programme offers low-cost funding to financial institutions to increase lending to sci-tech small-and-medium enterprises (SMEs) and high-tech firms, which posted higher-than-average YoY loan growth of 19.8% and 7.5% in 2025, respectively.

Digital & Green Infrastructure (Million Units)



*Note: Units of standard operating racks, as of September 2025
Source: Ministry of Industry and Information Technology, National Energy Administration

Relending for Technology Innovation and Technical Transformation (RMB Billion)



Source: People's Bank of China

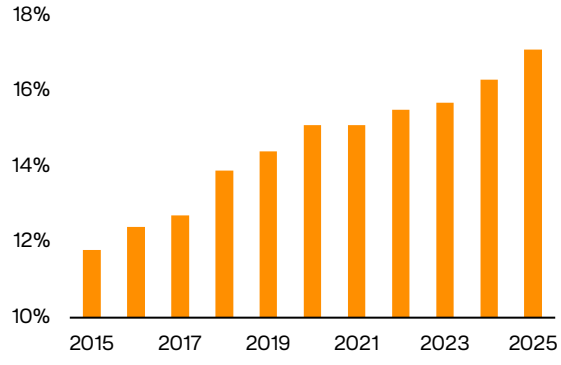
On the fiscal policy front, the authorities have deployed guarantees for loans to sci-tech SMEs, value-added tax refunds for high-tech exports (such as photovoltaics and batteries), and tax deductions for R&D activity. In addition, the third National Integrated Circuit Industry Investment Fund (NICIIF)[1] was established in 2024 with registered capital of RMB 344 billion, larger than the prior two NICIIFs, aimed at turbocharging national investment in critical semiconductor equipment and AI chip development.

High-tech transformation gathers pace on multiple levels

Advanced manufacturing has taken the lead among industrial sectors. The industrial sector's composition has been systematically optimised, with a rising share of high-tech manufacturing (rising from 11.8% of industrial output in 2015 to 17.1% in 2025) and equipment manufacturing (from 31.8% to 36.8%). These industries encompass electrical machinery, computers, communication & electronic equipment, as well as railway, ship and aerospace equipment. Despite intense global competition, these advanced industries have demonstrated remarkable resilience. In 2025, profits in high-tech and equipment manufacturing enterprises surged by 13.3% and 7.7% YoY, respectively, outperforming the mild 0.6% growth in the broader industrial sector. This divergence highlighted that industrial upgrading is not merely raising output, but successfully moving the manufacturing base up the value chain to generate robust business returns.

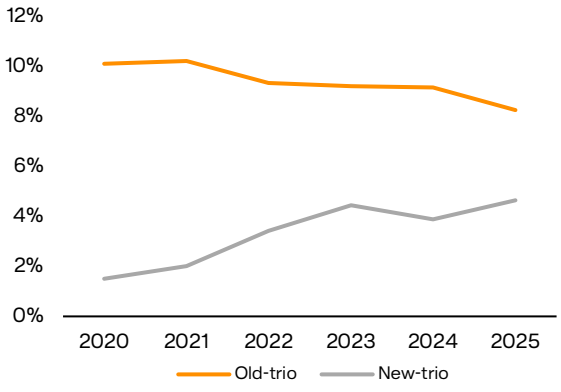
The export structure has decisively shifted away from labour-intensive goods. Historically, Chinese exports capitalised on a cost-effective labour force, land and energy to drive the "old-trio" of exports: clothing, furniture and household appliances. However, as the 14th FYP prioritised new quality productive forces, the "new-trio" (EVs, solar panels, lithium-ion batteries) emerged as new growth drivers. During 2020 and 2025, the export share of "old-trio" declined from 10.1% to 8.2%, while the share of "new-trio" rose from 1.5% to 4.6%, contributing to nearly 20% of the export growth in 2025. It indicated a shift from labour-intensive to technology-intensive exports.

Share of High-tech Manufacturing in Industrial Sector



Source: National Bureau of Statistics

Share of Exports



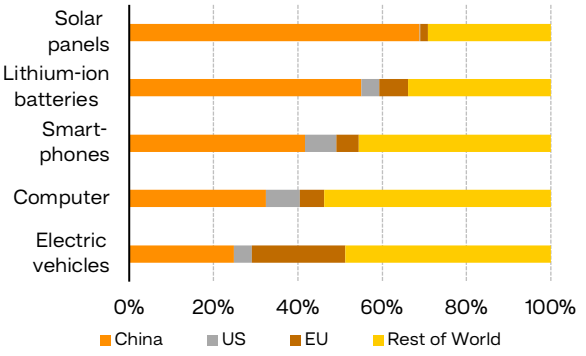
Source: General Administration of Customs

Chinese manufacturers have secured dominant positions across global green and digital supply chains. Chinese manufacturers hold a commanding global presence, accounting for 28.0% of global manufacturing value-added in 2024. This leadership is particularly pronounced in key green and digital categories. In 2024, the Chinese Mainland's exports of solar panels, lithium-ion batteries

[1] The funding of NICIIF was raised by the Ministry of Finance, policy banks and the state-owned major commercial banks. The first NICIIF was established in 2014 with registered capital of RMB 98.7 billion, followed by the second NICIIF in 2019 with registered capital of RMB 204.2 billion.

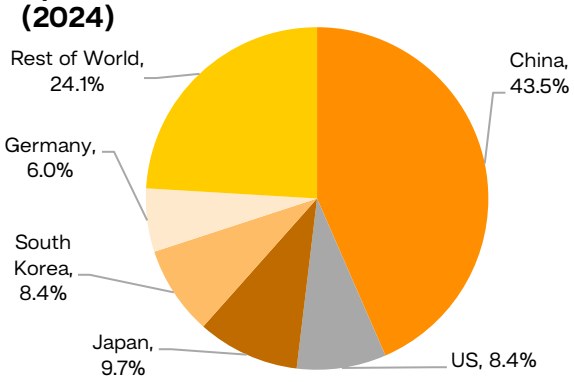
and smartphones accounted for 68.9%, 55.0% and 41.6% of global exports, respectively. Furthermore, the economy has advanced rapidly in industrial automation. According to the International Federation of Robotics, the Chinese Mainland's operational stock of industrial robots reached 2.0 million units in 2024, representing 43.5% of the global total, well ahead of Japan (9.7%), the US (8.4%), South Korea (8.4%) and Germany (6.0%). This strength in automation further solidifies the Chinese Mainland's position as the global leader in intelligent manufacturing.

Share of High-tech Products Exports (2024)



Source: UN Comtrade

Operational Stock of Industrial Robots (2024)



Source: International Federation of Robotics

The next 5 years: a maturing high-tech ecosystem

In the coming 5 years, a diversified and mature advanced manufacturing cluster will take shape. Building upon the 14th FYP's focus on innovation capacity, the 15th FYP places continuous emphasis on the deep integration of innovative technology within industrial transformation. Looking forward to the 15th FYP period (2026-2030), building a modernised industrial system is stressed as the foremost development priority, supported by initiatives ranging from upgrading traditional industries, nurturing emerging industries to consolidating a self-sufficient industrial chain:

1) **Upgrading traditional industries:** The steel, petrochemical and shipbuilding sectors are highlighted in the 15th FYP for quality upgrade. Technical transformations toward intelligent, green and service-oriented manufacturing will be performed to redefine these traditional industrial sectors. According to the National Development and Reform Commission (NDRC), this upgrading process is projected to create an additional RMB 10 trillion in economic values.

2) **Nurturing emerging and future industries:** The 15th FYP outlined 8 strategic emerging industries (Table 1) aimed at achieving economies of scale through the wider adoption of new technologies, products and application scenarios. The NDRC estimates that the collective market scale of semiconductors, aerospace, biopharmaceuticals, the low-altitude economy, new-type energy storage and robotics will expand from RMB 6 trillion in 2025 to RMB 10 trillion in 2030. In addition, the 15th FYP calls for the rapid industrialisation of frontier technologies, identifying 6 future industries (Table 1) to serve as new growth engines through the exploration of novel technology roadmaps, business models and regulations.

3) **Consolidating a resilient and self-sufficient industrial chain:** In the face of an increasingly complex external environment, it is crucial to enhance supply chain stability, thereby ensuring

manufacturing production, maintaining cost management and promoting economic growth. The 15th FYP emphasises strengthening competitive advantages in rare earths, rare metals and superhard materials, alongside the efficient utilisation of strategic minerals. More importantly, the nation pledges to advance home-grown breakthroughs in foundational technologies and production processes to ensure a stable supply of critical inputs for advanced manufacturing.

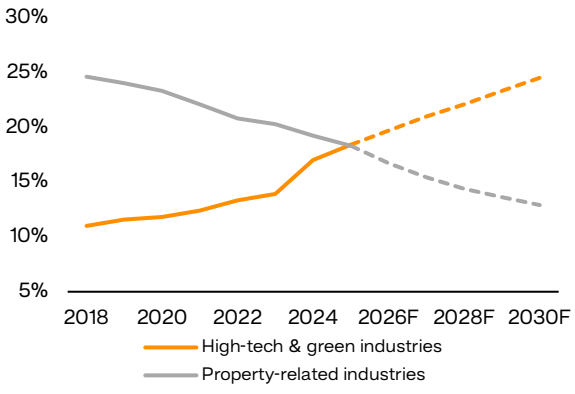
Table 1: List of Emerging and Future Industries	
8 Strategic Emerging Industries	**6 Future Industries**
Next-generation information technology	Quantum technology
New energy	Biomanufacturing
New Materials	Hydrogen & nuclear fusion power
Intelligent connected new-energy vehicles	Brain-computer interfaces
Robotics	Embodied AI
Biopharmaceuticals	6G mobile communications
High-end equipment	
Aerospace	

Source: 15th Five-Year Plan (2026-2030) for National Economic and Social Development of the People's Republic of China

AI will serve as a driving force to empower high-tech related consumption. In August 2025, the authorities issued a policy guideline to implement the "AI+" initiative, which called for an in-depth integration of AI across consumer services (e.g. cultural entertainment, e-commerce, elderly care) and smart devices (e.g. autonomous driving, smart home products and robotics). According to the International Data Corporation (IDC), a global market research firm, consumer spending on embodied intelligent robots in the Chinese Mainland is forecast to surge from USD 1.4 billion in 2025 to USD 77 billion in 2030, which points to massive consumer demand to be unlocked.

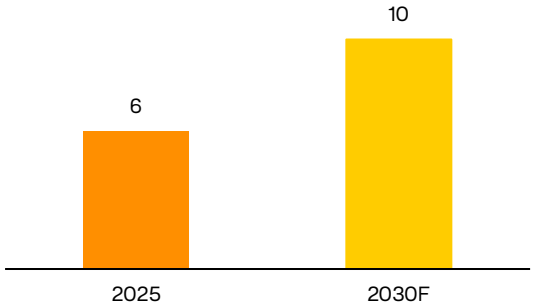
High-tech & green industries are poised to overtake the property sector. Driven by a proactive policy stance to build a modernised industrial system, high-tech and green industries will continue to thrive in the medium-to-long term. According to Bloomberg's estimates, the output share of high-tech & green industries will increase from 18.4% of GDP in 2025 to 24.5% in 2030, overtaking the property-related industries (consisting of property services and construction), which are projected to decline from 18.3% to 12.9%. This anticipated inflection underscores the Chinese Mainland's transition toward a technology-driven economy.

Output by Industries (% of GDP)



Source: Bloomberg

Market Scale of Selected Emerging Sectors* (RMB Trillion)



*The sectors include semiconductors, aerospace, biopharmaceuticals, the low-altitude economy, ney-type energy storage and robotics
Source: National Development and Reform Commission

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