MANUFACTURING AND VALUE CHAINS

Made in China 2.0: The future of global manufacturing?

Deep dive

Made in China 2.0: an AI-augmented, green-energy-powered, self-reliance-oriented transformation of the world's most formidable industrial base. Image: via REUTERS

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This article is part of:
Annual Meeting of the New Champions

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- First announced in 2015, *Made in China 2025* (MIC2025) set the tone and tempo of China's industrial ambitions.
- Today, this stategy is entering a new phase — an AI-augmented, green-energy-powered, self-reliance-oriented transformation of the world's most formidable industrial base.
- The question is no longer whether China can innovate, but what kind of innovation ecosystem it is building — and how it can redefine manufacturing across the world.

Launched a decade ago, "Made in China 2025" appeared to many as the emblem of China's vaulting industrial ambitions: a state-driven roadmap to catapult the nation from the world's factory floor to the apex of advanced manufacturing.

Though the slogan itself quietly vanished from official Chinese discourse under international scrutiny, the underlying agenda never did. Instead, its objectives evolved, were rebranded under banners like "dual circulation" and "high-quality elopment," and ultimately seeped into the marrow of China's industrial tegy.

Today, that strategy appears to be entering a new phase — one we might call "Made in China 2.0." While it lacks a formal label, its contours are increasingly clear: an AI-augmented, green-energy-powered, self-reliance-oriented transformation of the world's most formidable industrial base. In everything from electric vehicles and solar panels to humanoid robots and enterprise-grade AI systems, China is defining the terms of competition.

This transformation is unfolding amid profound global shifts. Fragmenting supply chains, rising techno-nationalism, and concerns over overcapacity have created a contested landscape for global manufacturing. Yet within that turbulent context, China has continued to expand its industrial and technological footprint. The question is no longer whether China can innovate, but what kind of innovation ecosystem it is building — and whether it might constitute an alternative paradigm to the liberal market model.

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Made in China 2025: Progress and pitfalls

When first announced in 2015, *Made in China 2025* (MIC2025) was intended as a blueprint for industrial transformation. Its goal was ambitious: to reduce reliance on foreign technology and move China up the global value chain in ten strategic sectors, including semiconductors, advanced robotics, aerospace, and biomedicine. Heavily inspired by Germany's *Industry 4.0* initiative, MIC2025 promised to turn China into the world leader in high-end manufacturing by the centennial of the People's Republic in 2049.

Despite its reputation as a detailed industrial master plan, MIC2025 was never a granular policy blueprint. It lacked the specificity of, say, Japan's MITI-guided industrial policies of the 20th century. Instead, it functioned more as a directional roadmap, articulating broad strategic goals and priority sectors while setting key performance indicators (KPIs) for local governments, Party officials, and state-affiliated enterprises.

These KPIs — such as achieving certain levels of domestic market share in strategic technologies — became targets for bureaucratic mobilization. But the plan offered limited guidance on implementation, leaving ample room for interpretation, duplication, and misalignment at the provincial and municipal levels. In this sense, MIC2025 was less a coordinated policy execution than a signaling device: it announced China's industrial ambitions and set the tempo for resource allocation, political attention, and institutional experimentation.

By some measures, MIC2025 has delivered. China now dominates key green technologies: over 75% of global lithium-ion battery manufacturing, nearly 80% of solar module production, and the lion's share of the world's electric vehicle output. High-speed rail has become a showcase of engineering prowess. In robotics and sor technologies, rapid progress has narrowed the gap with global leaders.

But the programme also fell short in critical areas. Despite massive investment, China remains reliant on foreign technology for advanced semiconductors and critical high-end components. Indigenous development of biopharmaceuticals and next-generation aircraft has lagged behind expectations.

According to assessments, such as the Rhodium Group's recent report, some of MIC2025's shortcomings stemmed from systemic design flaws: duplication of investment across regions, misaligned local incentives, overreliance on subsidies, and an excessive focus on the production side of the economy at the expense of household demand.

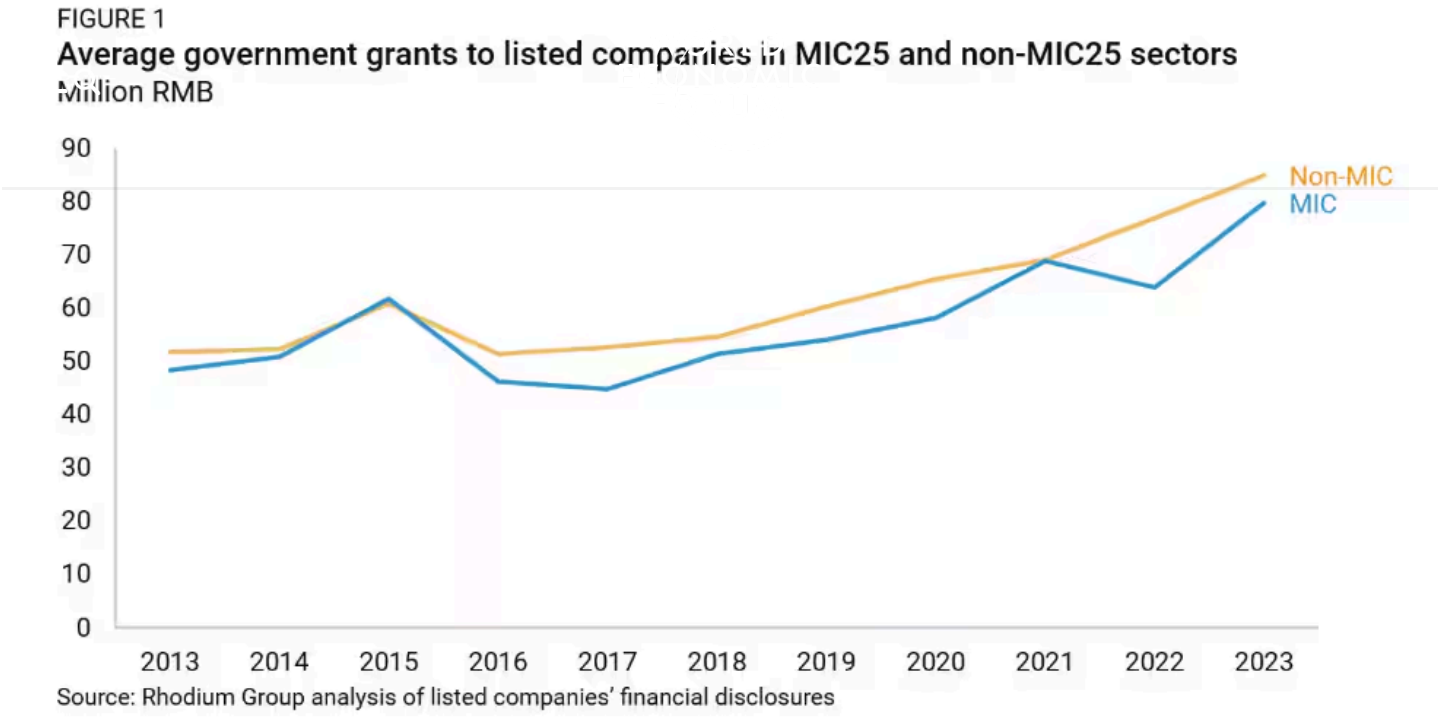

Image: Rhodium Group

Moreover, the programme's high-profile rollout drew unwanted geopolitical scrutiny. It triggered concerns in Washington and Brussels about state-led techno-mercantilism, prompting export controls and investment restrictions that now weigh heavily on China's access to key technologies. Despite the slogan's disappearance from official discourse, the strategic ambition behind it continues, often under different guises.

Rather than being a failed policy, MIC2025 may be better understood as a catalytic phase: an initial framework that helped mobilize investment, galvanize industrial upgrading, and instill long-term vision. It established an industrial scaffolding that China has since refined and expanded upon, setting the stage for a more decentralized, networked, and innovation-driven phase of development.

Compounding engine for China's industrial momentum

One of the most distinctive features of China's industrial ascent is the way its key sectors have become mutually reinforcing. As Princeton researcher Kyle Chan has ued, China's innovation system is not a collection of isolated verticals, but a of overlapping, cross-pollinating ecosystems. Advances in one domain — say,

lithium batteries — generate spillover benefits in others, such as electric vehicles, consumer electronics, and energy storage systems. In turn, demand from those sectors drives scale and further innovation upstream.

Consider the smartphone supply chain. Its maturation yielded not just cheaper and more efficient components, but also expertise in compact displays, lightweight materials, and precision manufacturing — all of which now benefit the EV industry. Similarly, breakthroughs in battery chemistries designed for electric scooters or drones are feeding into grid-scale storage and smart energy applications. AI and robotics both absorb and amplify these synergies, enabling greater automation and optimization across the board.

This systemic interdependence has become a compounding engine for China's industrial momentum. The result is not just faster scaling, but accelerated learning curves, lower costs, and a greater capacity to iterate. It gives Chinese firms strategic optionality and the ability to pivot quickly when conditions shift—an asset in a fragmented and fast-changing global economy.

'Process knowledge' and hands-on experience

Underlying this ecosystemic advantage is something more foundational: the retention and deepening of "process knowledge" — something the Germans might call *fingerspitzengefühl*, or "fingertip feel." As Western economies — particularly the US — saw manufacturing hollow out, China went the other way. It continued to build out domestic production networks, climbing steadily up the value chain while embedding knowledge in the routines, tools, and people that form the bedrock of real-world innovation.

Process knowledge refers to the tacit, experiential know-how that accumulates on factory floors, in supply chain coordination, and in the trial-and-error of prototyping. It is notoriously hard to codify. But it is indispensable for translating design into production and invention into mass adoption. Without it, even the most cutting-edge labs struggle to achieve scale.

analyst and Stanford University researcher Dan Wang, in a memorable analogy ng a 2023 Nova documentary I helped make called *Inside China's Tech Boom*,

compared this to cooking: you can have the finest kitchen, ingredients, and recipe — but if you've never cooked before, even scrambled eggs can elude you. The tools and blueprints are not enough. You need hands-on experience.

In China, that experience is ubiquitous. Engineers routinely move between design and production roles. Suppliers and manufacturers co-locate and collaborate in real time. Iteration happens not in years, but in weeks or even days. This tight coupling of R&D and manufacturing creates a flywheel: production informs innovation, which in turn improves production. It's a model that is often underappreciated in economies where the two functions are treated as discrete.

As we look toward a possible "Made in China 2035," this structural advantage — the fusion of innovation with manufacturing — may prove to be China's most enduring asset.

Survival of the fastest learners

China's industrial advance is not solely the product of state planning or infrastructure buildout. Increasingly, it is animated by a new generation of entrepreneurs whose outlook, capabilities, and ambitions are reshaping what it means to be "Made in China." This emerging cohort is defined less by legacy manufacturing and more by integrated systems thinking, technical fluency, and global competitiveness.

As recent discussions at the Annual Meeting of the New Champions have shown, these entrepreneurs are navigating a high-stakes environment, with global demand softening, supply chains diversifying, and trade tensions lingering. Yet many express growing confidence. Part of that stems from the intense pressure-cooker conditions under which they've emerged: domestic markets that are highly competitive, unforgiving of inefficiency, and constantly evolving. It's not just survival of the fittest, but survival of the fastest learners.

In sectors like EVs, solar, robotics, and AI, China's most successful companies are often those that have learned to thrive with minimal state support, iterating quickly and scaling aggressively. BYD, for instance, has leveraged its vertical integration not merely to control costs, but to speed up innovation cycles and outpace rivals on both price and performance. EV firms like Xpeng and NIO are redefining what premium looks like in a Chinese context — often with global aspirations baked in from the outset.

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There is also a renewed cultural valorization of industrial achievement. As China shifts from platform economies and speculative tech toward real-economy innovation, the industrialist is being recast as a central figure in the national story — one who not only builds wealth, but also contributes to technological sovereignty and climate goals. The public-private synergy is not always smooth, but it is increasingly characterized by complementary strengths: long-term state vision and short-term entrepreneurial agility.

This shift is particularly salient in "frontier" spaces like AI+ (described below), robotics, and smart manufacturing, where entrepreneurs are not merely adapting to existing markets, but helping to create entirely new ones. Their confidence rests not just in China's scale, but in their capacity to experiment, fail fast, and move first.

AI as infrastructure and smart manufacturing

Much of the global conversation about artificial intelligence still centres on AI as a consumer-facing product: chatbots, copilots, image generators. But in China, a more structural view is taking hold: AI is not seen as a standalone technology, but

as infrastructure. It is the invisible layer that will underpin the next phase of industrial transformation.

This perspective is evident in how AI is being integrated across China's manufacturing base. In smart factories, AI optimizes energy consumption, predicts maintenance needs, and fine-tunes production in real time. In logistics, it orchestrates fleets and warehouses with near-frictionless precision. In sectors like EVs and robotics, AI is less a feature than a foundational operating system.

The term "AI+" has entered the official lexicon, emphasizing the additive, enabling function of artificial intelligence. As participants at the Annual Meeting of the New Champions in Tianjin discussed in a session titled "The Time of AI+," this concept frames AI as a general-purpose technology whose value lies in the industries it empowers. It's not about winning a chatbot arms race; it's about redefining productivity, quality, and customization at scale.

Equally significant is the open-source orientation emerging in parts of China's AI community. Models like DeepSeek have catalysed government enthusiasm and market confidence not just because of their performance, but because of their accessibility. This diffusion of capability across second- and third-tier cities,

SMEs, and traditional manufacturers mirrors the way smartphones once seeded a broader hardware ecosystem. It democratizes innovation in ways that centralized AI strategies in other countries may struggle to replicate.

Crucially, AI's deep integration into manufacturing tightens the feedback loop between software and hardware — a synergy that China is uniquely positioned to exploit. When design, engineering, and production all happen within a dense industrial cluster, new tools can be field-tested and refined in days rather than months. This "short-cycle innovation" is becoming a signature of China's approach to intelligent industry.

If China succeeds in embedding AI as a kind of industrial operating system, it may well define what "smart manufacturing" means for the rest of the world.

Made in China 2035? The divide between 'tech' and 'industry' dissolves

What might "Made in China 2035" come to signify? It seems clear that if the trajectory continues, tempered by lessons from MIC2025 and accelerated by AI, electrification, and self-reliance, then the term may will be about setting the pace, and not merely catching up.

We can expect a redefinition of industrial leadership, one less reliant on scale alone and more on speed, sustainability, and systemic integration. Chinese manufacturing will likely become even more vertically integrated, but also more modular, interoperable, and digitally orchestrated. Industrial clusters — already dense and synergistic — may evolve into "computational zones," where physical production and digital coordination are inseparable.

Supply chains, while de-risked and diversified for geopolitical reasons, will still rely on the unique advantages of China's manufacturing heartlands. These regions — particularly the Yangtze River Delta and the Greater Bay Area in the Pearl River Delta — will function as innovation hubs, where new materials, new energy systems, and new human-machine interfaces are co-developed in situ.

In such a future, the divide between “tech” and “industry” dissolves entirely. AI doesn’t just assist manufacturing: it becomes part of its DNA. Robotics not only automates tasks but shapes how products are conceived, iterated, and delivered. Materials science converges with biotechnology and environmental engineering to create self-healing composites, energy-generating fabrics, or waste-neutral production loops.

Equally significant will be the export of standards and models. As with high-speed rail and green energy tech, China’s manufacturing playbook — efficient, fast-moving, AI-integrated — could become an object of emulation for the Global South and even parts of the developed world. “Made in China” would no longer signal cost-efficiency alone, but design excellence, carbon minimalism, and software-defined manufacturing.

Of course, none of this is guaranteed. Policy missteps, decoupling shocks, or demographic drag could still alter the arc. But the scaffolding is already visible, and the momentum substantial. If MIC2025 was a bet on capability, MIC2035 will be a bet on coherence — a system of systems that learns, adapts, and self-improves.

In that vision, manufacturing is no longer the endgame. It’s the engine.

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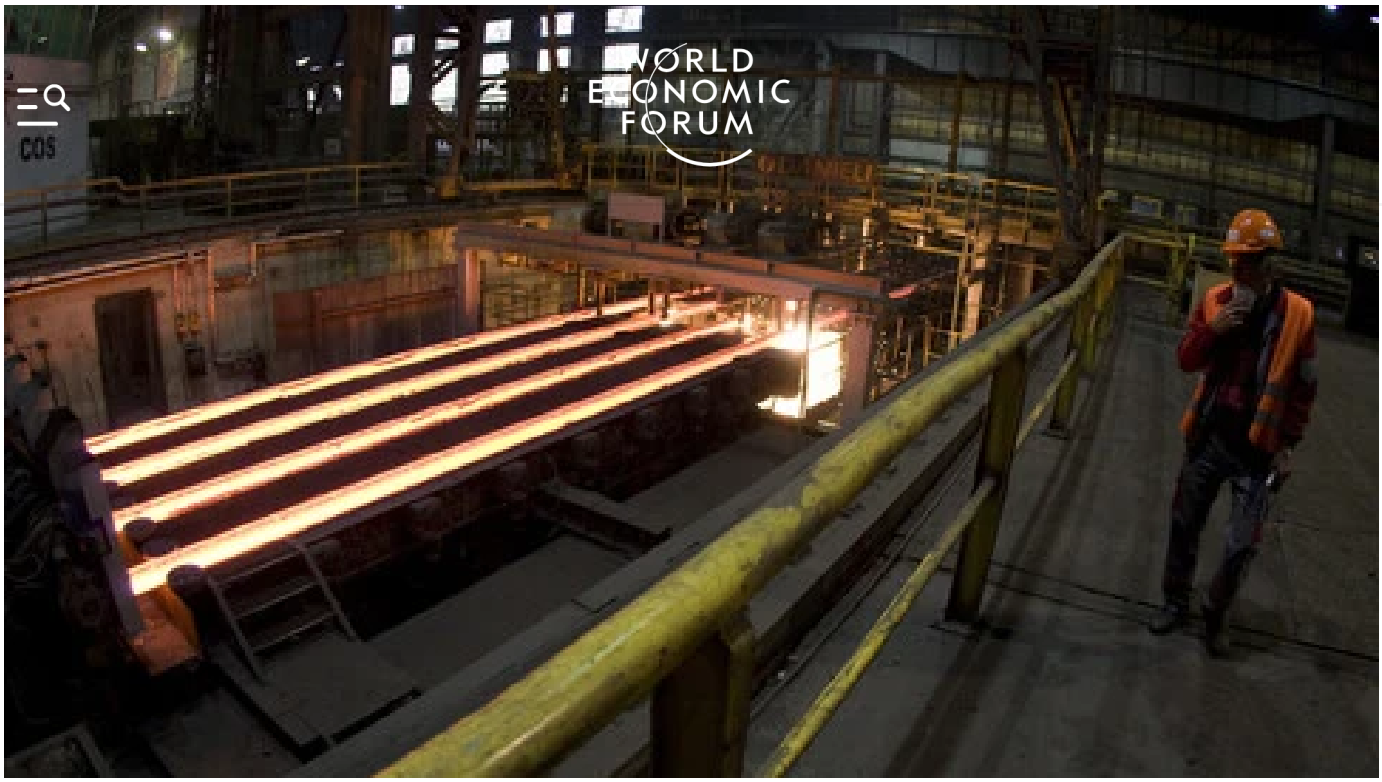

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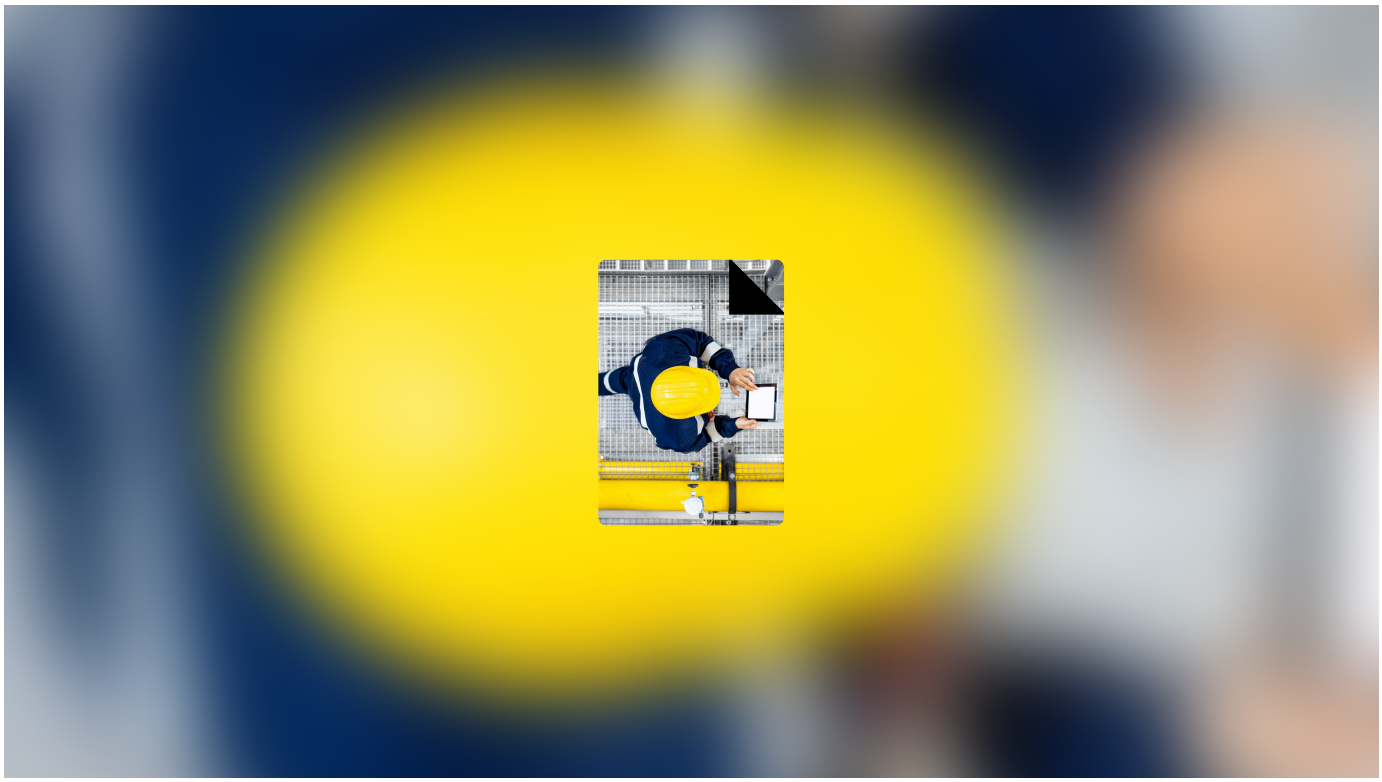

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