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"Made in China 2025" Industrial Policies: Issues for Congress

The People's Republic of China (PRC or China) aims to gain a global economic and technology leadership position through a range of state-led industrial and related science and technology (S&T) policies. These policies feature a heavy government role in directing and funding PRC firms to acquire foreign technology and related capabilities—including basic and applied research and talent—in areas where the United States has long been a global leader and has strong comparative advantages. Many Members of Congress have expressed concern that China's policies, if successful, could undermine U.S. technological leadership, further shift advanced production and research to China, and support a wide range of China's advancements, including in defense. The scope and scale of China's efforts are evident in the amount of state direction and support devoted to them; PRC ambitions to lead across the entire value chain, rather than just segments of it, in key advanced and emerging technologies; and the range of tactics China uses use to target and acquire U.S. and allied capabilities.

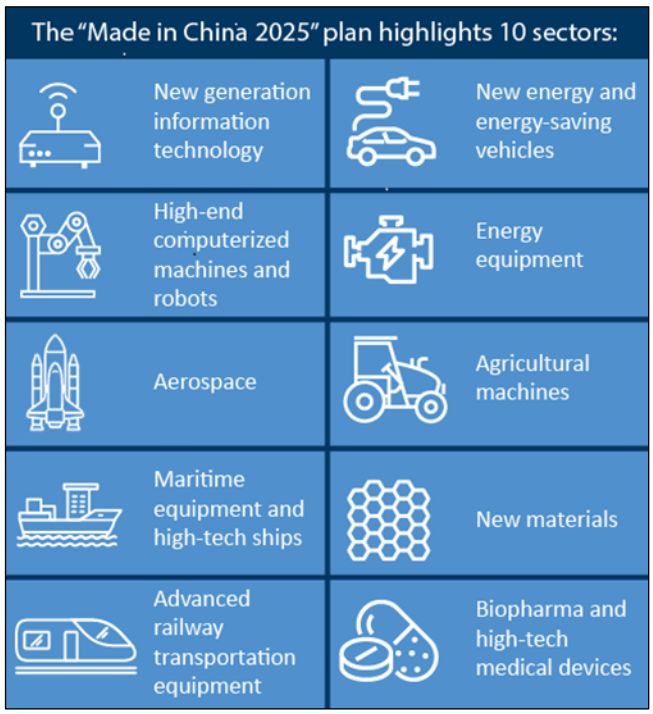
Overview

In November 2022, at its 20th Party Congress, the Communist Party of China (CPC) reinforced its focus on technological innovation as the core driver of China's development. The CPC initially set that focus in its *Medium- and Long-Term Plan for Science in Technology (MLP) (2006-2020)*. The MLP calls for more assertive efforts to acquire foreign technology and for PRC firms to lead such efforts. In support of the MLP, in 2015, China's State Council issued *Made in China 2025* (*MIC2025*)—a broad set of industrial plans that aim to boost competitiveness by advancing China's position in the global manufacturing value chain, "leapfrogging" into emerging technologies, and reducing reliance on foreign firms. *MIC2025* stresses "indigenous" innovation, but this process often involves the acquisition, absorption, and adaptation of foreign technology by PRC entities that recast these capabilities as their own. The MLP promotes diverse forms of state ownership and control of PRC firms and increases firms' flexibility to operate overseas, which may obscure the full extent of the PRC state's role in business actions.

MIC2025 calls for technological breakthroughs in 10 sectors, supports a range of sector-specific plans (**Figure 1**), and sets goals for each sector to increase the share of production by PRC firms. (**Figure 2**). It calls for China to lead in each part of the value chain. In semiconductors, for example, this includes design, operating systems, production, packaging, testing, equipment, and materials. *MIC2025* is focused on advanced manufacturing and seeks to transform China's economy from one that assembles goods to one that invents the products it makes. Specific goals include the following:

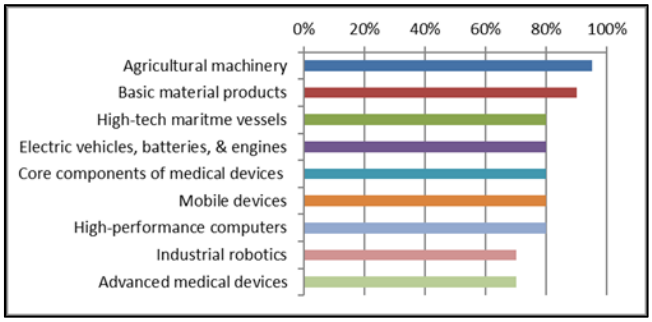
By 2025. Boost manufacturing quality, innovation, and labor productivity; obtain an advanced level of technology integration; reduce energy and resource consumption; and develop globally competitive firms and industrial centers. **By 2035.** Reach a level of development that is on par with global industry at "an intermediate level," improve innovation, make major technology breakthroughs, lead innovation in specific industries, and set global standards. **By 2049.** Lead global manufacturing and innovation with a competitive position in advanced technology and industrial systems. (This date coincides with the 100th anniversary of the founding of the PRC.)

Figure 1. China's Industrial Priorities (2015-2025)



Source: "Notice of the State Council on Issuing Made in China 2025, May 8, 2015, Guofa [2015] No. 28."

Figure 2. Select MIC 2025 Domestic Content Goals



Source: U.S.-China Business Council.

Note: Dates for domestic content goals range from 2020 to 2030.

China's 14th Five-Year Plan (FYP) for 2021-2025 promotes *MIC2025* goals in several respects. It seeks to develop

PRC-controlled supply chains to secure key inputs that *MIC2025* industries need. Similarly, the FYP calls for an expanded use of antitrust, IP, and standards tools—in China and extraterritorially—to set market terms and promote the export of *MIC2025* goods and services now coming to market. The FYP also emphasizes the value of China's foreign research ties in developing China's own competencies in a range of *MIC2025* technology areas.

China's Approaches to Implement *MIC2025*

Tax, trade, and investment measures. China uses tax preferences to incentivize foreign firms to shift production and research and development (R&D) to China. It uses standards, IP, competition, and procurement policies, and other terms that seek to transfer foreign know-how to PRC entities and use PRC suppliers for key components.

Forced joint ventures (JVs) & partnerships. China's formal regulations and informal practices require a foreign firm to partner with a PRC entity and drive foreign firms into JVs. In many sectors (e.g., aerospace), China leverages its role as a major purchaser to press for JVs and technology transfer in order to develop indigenous capabilities. In most cases, the foreign firm's partner is a state firm or the PRC government.

Government subsidies. PRC government guidance funds (GGFs) channel state funding to PRC firms in support of domestic R&D and overseas acquisitions. Almost 1,800 GGFs tied to *MIC2025* together registered a capital target of $1.5 trillion and had raised $627 billion toward this target as of early 2020. GGFs often take a stake or board seat in firms they fund and can influence corporate decisionmaking.

Foreign acquisitions. GGFs target and fund acquisitions of foreign firms and build China's capabilities through foreign firms' expertise, IP, talent pools, and ties to suppliers and customers.

Technology licensing & equipment. Foreign technology and equipment fill key gaps in China's current capabilities. PRC firms are members of U.S.-led open source technology platforms (e.g., RISC-V, the Open Compute Project, and the ORAN Alliance). Since 2014, U.S. semiconductor equipment exports to China have increased nearly five-fold as China seeks to make its own chips.

Talent recruitment and training. China encourages the return of PRC expatriates and the hiring of foreign talent. Many PRC technology firms (e.g., Alibaba, Baidu, Tencent, and TikTok) have U.S. R&D centers that often partner with U.S. universities. Many PRC nationals participate in U.S. federally funded research in areas that overlap with *MIC2025* technologies.

U.S. and International Concerns

MIC2025 has been a major U.S. policy focus because of the tactics it has intensified, such as technology transfer, licensing and JV requirements, PRC state-directed IP theft, and PRC state-funded acquisitions of firms in strategic sectors. PRC officials say that *MIC2025* policies are fair, but many in the U.S. and foreign business and policy communities assess the risks and distortions differently.

- A 2017 study by the U.S. Chamber of Commerce concluded "MIC 2025 aims to leverage the power of the state to alter competitive dynamics in global markets in industries core to economic competitiveness. By targeting and channeling capital to specific technologies and industries, MIC 2025 risks precipitating market inefficiencies and overcapacity, globally."

- A 2016 study by the Mercator Institute for China Studies warned that China's acquisitions aim "to systematically acquire cutting-edge technology and generate large-scale technology transfer. In the long term, China wants to obtain control over the most profitable segments of global supply chains and production networks."

- A 2019 study by the Organisation for Economic Co-operation and Development found that PRC semiconductor firms overwhelmingly benefitted from below-market government equity injections as compared to other firms. It found the state's role in China's industry to be more pervasive than formal ownership reflects, due to the opacity of state shareholding and funding.

U.S. Policy Response

The Trump Administration sought to address *MIC2025* and related PRC practices that it assessed unfairly advantaged China, distorted trade, and strengthened China's technology and military capabilities. In 2018, it invoked Section 301 authorities and imposed tariffs on most imports from China, in response to findings that China's policies harmed U.S. stakeholders. A January 2020 bilateral economic and trade agreement resulted in some IP and technology transfer commitments by China but left most U.S. concerns unresolved. The U.S. government has ramped up law enforcement to counter China's theft of U.S. IP, restricted certain PRC firms from U.S. infrastructure, and started to scrutinize China's role in federally funded research. A June 2021 U.S.-EU deal restricts U.S. and EU aerospace technology transfer to China. Congress passed legislation in 2018 to strengthen foreign investment review (P.L. 116-801) and export control authorities (P.L. 115-232). In 2022, Congress passed the CHIPS and Science Act (P.L. 117-167) to support U.S. capabilities in semiconductors and other technologies.

Issues for Congress

The Executive Branch to date has not sought to enforce China's commitments on IP and technology transfer even as the PRC government expands its statist practices. The USTR to date has kept tariffs, saying it is difficult to justify lifting them when the PRC government has not changed its practices of concern. Some Members have sought to restrict investment, trade, technology, and research ties that support *MIC2025*, diversify critical supply chains away from China, and prohibit China from participating in U.S. infrastructure and federal procurement. Congress might examine

- The efficacy of U.S. tools and policies in practice (e.g., export control, foreign investment, and antitrust) in countering China's industrial policies;
- Implementation of recent agreements and negotiation of new rules;
- Whether the PRC state's growing role in business calls for treating PRC firms differently;
- The future trajectory of U.S.-PRC technology ties and how current trade, investment, and technology transfer might affect U.S. competitiveness; and
- How China's reliance on certain U.S. capabilities strengthen U.S. leverage and create U.S. options to counter PRC industrial policies.

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