



Made in China 2025 and 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. Some Members of Congress have expressed concern that China’s policies, if successful, could undermine U.S. technological leadership, further shift advanced technology, production, and research to China, and support a wide range of China’s technological advancements, including in defense. The scope and scale of China’s efforts are evident in the amount of state direction and support devoted to these efforts; PRC policies to lead across the entire value chain (rather than just segments of it) in key advanced and emerging technologies; and the tactics China uses to target and acquire U.S. and allied capabilities.

Overview

In November 2022, at its 20th Party Congress, the Communist Party of China (CPC) reiterated its focus on technological innovation as the core driver of China’s development, a focus it first set in its *Medium- and Long-Term Plan for Science in Technology (MLP) (2006-2020)* and reaffirmed in its MLP for 2021-2025. These MLPs call for advancing China’s technological and scientific self-reliance and advocate for assertive PRC corporate efforts to acquire foreign technology and knowhow.

To implement the 2006-2025 MLP, in 2015, China’s State Council issued *Made in China 2025 (MIC2025)*—a broad set of industry plans to boost PRC competitiveness by advancing China’s position in the global manufacturing value chain, “leapfrogging” into emerging technologies where there are not yet defined global industry leaders and standards, and reducing reliance on foreign firms. PRC plans rely on foreign technology and research to develop PRC capabilities and talent. *MIC2025* stresses “indigenous” innovation, a process that often involves the acquisition, absorption, and adaptation of foreign technology by PRC entities, which may later recast these capabilities as their own. This “indigenous” strategy obscures the extent of PRC state ownership and control of PRC firms, and the role PRC firms may play in advancing PRC development goals.

MIC2025 calls for technological breakthroughs in 10 sectors (Figure 1) and support for a range of sector-specific plans. These plans aim to make China the leader in all parts of the global value chain, and to increase the share of inputs and finished goods produced in China and worldwide by PRC firms. (Figure 2.) For semiconductors, for example, this includes leadership in the full supply chain (e.g., design, operating systems, production, packaging, testing, equipment, and materials) by PRC firms. *MIC2025* is focused on advanced manufacturing and on transforming

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.

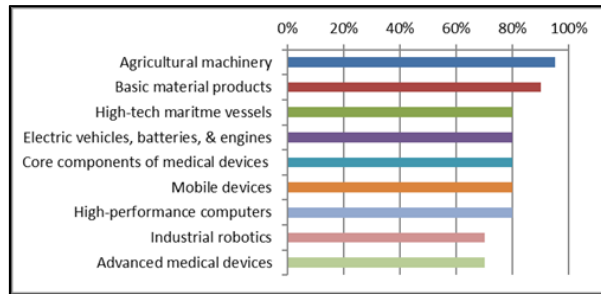
By 2049. Lead global manufacturing and innovation with a competitive position in advanced technology and industrial systems. (This date coincides with the 100th anniversary of the founding of the PRC.)

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

The “Made in China 2025” plan highlights 10 sectors:	
 New generation information technology	 New energy and energy-saving vehicles
 High-end computerized machines and robots	 Energy equipment
 Aerospace	 Agricultural machines
 Maritime equipment and high-tech ships	 New materials
 Advanced railway transportation equipment	 Biopharma and high-tech medical devices

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

China’s current economic development plan, the 14th Five-Year Plan (FYP) for 2021-2025, promotes *MIC2025* goals by seeking to strengthen PRC-controlled supply chains in order to bolster *MIC2025* priority industries. The FYP also calls for expanding the use of antitrust, intellectual property, and technical standards tools to set market terms and promote the export of *MIC2025* priority goods and services. The FYP also directs the expansion of foreign research ties for the development of PRC capabilities in *MIC2025* areas. Deliberations on the 15th FYP are slated to start in 2025.

Figure 2. Select Made in China 2025 Domestic Content Goals

Source: U.S.-China Business Council, *Navigating the 'Made in China 2025' Roadmap and China's Market Share Goals*, February 2016.

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

Market Effects

China has emerged as a global leader in some emerging manufacturing (e.g., solar panels, electric vehicles, drones) and heavy industry (e.g., shipbuilding and high-speed rail) sectors. Progress in developing capabilities in other sectors (e.g., aerospace, agricultural equipment, and robotics) has been slower. China has made gains in semiconductors, in part through foreign ties (acquisitions, partnerships, and technology licensing), but still depends on foreign tools and equipment, research, and advanced chip production. As PRC firms take a leading position in China in sectors such as electric vehicles (EVs) and information technology, some foreign firms are struggling to compete in China. As *MIC2025* products come to market, PRC firms are looking to exports for growth and are facing increased scrutiny, restrictions, and competition as foreign governments move to promote domestic industry, restrict PRC firms, and counter *MIC2025* policies (see below). Other foreign ties remain open to China (e.g., open-source hardware and software technology, overseas investment, and research).

U.S. Concerns and Policy Response

MIC2025 has been a U.S. policy focus because of the PRC tactics it has incentivized, such as technology transfer, licensing and JV requirements, IP theft, and state-funded acquisitions of foreign firms in strategic sectors. U.S. and foreign industry groups have expressed concerns that *MIC2025* policies distort competition in strategic industries, create overcapacity, and systematically drive foreign technology transfer to China. Some say that its tight market controls enable the PRC government to pressure foreign firms to adhere to its demands. The scope and scale of PRC state-led efforts are unprecedented as to the amount of state funding involved; stated ambitions to lead in all parts of global supply chains; and targeting of foreign capabilities.

The U.S. government has sought to counter *MIC2025* and related practices that it assessed unfairly advantaged China, distorted trade, and strengthened PRC technology and military capabilities. In 2018, for example, the Trump Administration invoked Section 301 of the Trade Act of 1974 and imposed tariffs on most imports from China, after finding that China's policies harmed U.S. stakeholders. In a January 2020 bilateral agreement, China agreed to some IP and technology transfer commitments; other U.S. concerns were unresolved. The U.S. government has not reported on enforcement of these commitments. The Biden Administration continued most of these tariffs and raised tariffs on some PRC goods (e.g., EVs, EV batteries, semiconductors,

medical products, cranes, solar cells, and aluminum and steel items). The U.S. government also ramped up IP enforcement and scrutiny of China's role in federally funded research. New rules seek to ban PRC-connected vehicle technology from U.S. markets and restrict advanced semiconductor technology exports to China.

China's Industrial Policy Approaches

Tax, trade, and investment measures. China uses tax preferences to incentivize foreign firms to invest in production and research and development (R&D). It uses **standards, IP, competition, and procurement policies**, and other terms to facilitate the transfer of 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 to operate in China 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 for domestic R&D and overseas acquisitions. Almost 1,800 GGFs tied to *MIC2025* sought to raise \$1.5 trillion and by 2020 had secured \$627 billion toward this target. GGFs often take a stake or board seat in firms they fund, and can influence corporate decision-making.

Foreign acquisitions. GGFs target and fund acquisitions of foreign firms and use foreign firms' expertise, IP, talent pools, and business networks to build China's capabilities.

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 and PRC-tied technology firms (e.g., Alibaba, Baidu, Tencent, and TikTok) have U.S. R&D centers that partner with U.S. universities. Many PRC nationals participate in U.S. federally funded research in areas that overlap with *MIC2025* technologies.

Issues for Congress

Some Members have sought to restrict trade, investment, trade, technology, and research ties with China; shift supply chains out of China; and prohibit PRC firms in federal procurement and infrastructure. Congress has enacted legislation to strengthen foreign investment review (P.L. 116-801) and export controls (P.L. 115-232); support U.S. capabilities in semiconductors (P.L. 117-167), EVs, and renewables (P.L. 117-169); and penalize China for IP theft (P.L. 117-336). Congress may deliberate:

- The efficacy of U.S. policies (in design and in practice) in countering China's industrial policies;
- Whether a growing state role in PRC companies calls for treating PRC firms differently;
- How U.S.-PRC trade, investment, technology, and research ties affect U.S. competitiveness and U.S. capacity and options to counter PRC policies.

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