The State of Chinese Innovation and Industrial Policy in the Mid-2020s

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PRESENTATION ABSTRACTS

China's Self-Reliance Goal: How Much Progress? | Barry Naughton & Zhuohan Fang

This presentation evaluates China's progress toward technological self-reliance, a central objective of its recent industrial policy, particularly under the 14th Five-Year Plan and the Dual Circulation Strategy. Using detailed customs data and newly defined "bottleneck technology groups," the authors examine shifts in China's import structure from 2015 to 2024 across capital and intermediate goods. The analysis distinguishes between genuine import substitution, persistent foreign dependence, and stockpiling behavior—particularly in semiconductor-related sectors.

Key findings indicate that while China has made measurable gains in substituting non-semiconductor capital goods and certain intermediate goods, high-tech sectors such as semiconductors and precision medical equipment remain dependent on imports. The study develops and applies a novel volatility and change index framework to classify trade patterns and identify areas of strategic progress versus continued vulnerability. The results suggest that China's strategy is successfully narrowing, rather than eliminating, external dependencies—raising questions about the sustainability of its self-reliance efforts and implications for global supply chains.

Was Made in China 2025 Successful? | Laura Gormley

Made in China 2025 (MIC25) was unveiled in 2015 as a sweeping industrial policy to transform China into a global leader in advanced manufacturing by 2025. In the years following the policy's launch, financial state support intensified, often through indirect channels. The proportion of companies enjoying tax benefits more than quadrupled between 2015 and 2023. State investment through government guidance funds increased more than five-fold between 2015 and 2020. Market barriers, particularly involving sales to Chinese government-linked entities and favored domestic competitors compelled foreign companies to localize production. Though discriminatory practices were rife before, interviews with market participants confirmed that 2015 was a turning point in many sectors.

But did all this support actually make MIC25 a success?

To answer this question, we measure outcomes across four main categories: China's import dependency, dependency on foreign companies, global competitiveness, and technological leadership. We combine data analysis from a wide range of sources, with surveys and interviews conducted with US Chamber of Commerce members operating in China. By analyzing specific sectors and sub-sectors, we aim to quantify and detail the impacts of MIC25, identifying areas where Chinese firms have succeeded and others where they continue to lag behind their global competitors.

The Securitization and Militarization of Chinese Innovation and Industrial Policy | Tai Ming Cheung

This presentation examines the sweeping transformation of China's innovation and industrial policy under Xi Jinping, highlighting a shift toward economic securitization and militarization in response to escalating geopolitical tensions and strategic rivalry with the United States. Since the mid-2010s,

and particularly after the COVID-19 pandemic, Chinese leadership has intensified efforts to insulate critical sectors, restructure supply chains, and fortify national security by embedding economic and technological resilience into industrial planning.

Key concepts such as "dual circulation" and "science and technology self-reliance" have become central to China's economic strategy, as reflected in the 14th Five-Year Plan. The authors explore how these frameworks have spurred a surge in top-down industrial policies, funding mechanisms, and institutional reforms aimed at reducing foreign dependence in sectors ranging from semiconductors to pharmaceuticals.

The presentation also outlines China's transition from peacetime military modernization to militarization in the early 2020s. This includes an expanded defense science, technology, and industrial base (DSTIB), the rise of the National Strategic Integration (NSI) framework, and the militarization of dual-use manufacturing sectors. Emerging domains—such as aerospace, cyberspace, AI, and unmanned systems—are emphasized as key frontiers for national security development.

Through a detailed analysis of recent policies, funding trends, and organizational restructuring, the authors show how China's techno-industrial strategy has become deeply intertwined with security and war-preparation logic—raising critical implications for global supply chains, strategic competition, and civil-military dynamics.

Strategic Emerging Initiatives and Deep Tech in China's Innovation System | Michael Laha

This paper analyzes two distinct steering modalities within China's innovation system that reflect strategic shifts in national science and technology priorities. The first modality is rooted in the Strategic Emerging Industries (SEIs) framework. Drawing on policy documents and a small data-set of institutions, the paper demonstrates how a subset of national engineering laboratories was reorganized beginning in 2020 to align with the reprioritized SEI categories established in 2016. This reprioritization emphasized advanced and new materials, prompting structural realignments in key research institutions. The second modality centers on the Chinese concept of "hard technologies" (硬科技), which corresponds to the concept of "Deep Tech" in anglophone debates on technology leadership—technologies characterized by high investment into research and extended development timelines. The paper will take a first look at the Shanghai Stock Exchange STAR Market in an effort to track the evolving criteria and usage of "hard tech" classifications. Together, these two modalities illustrate how China's innovation governance integrates both orientation against long-term strategic industry plans as well as definitions largely unlinked from such high-level policy planning documents.

Strategic Science: Europe's Dilemma in Engaging China on Quantum and Biotech | Jeroen Groenewegen-Lau

As China accelerates its push to become a global leader in quantum technology and biotechnology, European policymakers and research institutions face a complex balancing act. On one side lies the imperative to mitigate risks associated with dual-use technologies and knowledge leakage—particularly acute in the quantum computing domain, where strategic sensitivities have led to coordinated export controls with allies such as the US and Japan. On the other side is the need to sustain scientific collaboration, commercial partnerships, and innovation-driven growth, especially in biotech, where China-European engagement remains substantial through clinical trials, licensing deals and R&D investments.

This presentation explores the contrasting dynamics of quantum and biotech cooperation with China, examining the geopolitical and economic trade-offs that Europe must navigate. It also reflects on what these sectoral differences reveal about China's evolving innovation system and how they intersect with Europe's broader ambitions to bolster its own technological sovereignty and competitiveness.

Demonstration of Database on Chinese Science, Technology, Innovation, and Industrial Policy plans, strategies, and initiatives | Young Yang

The China Science, Technology, Innovation, and Industrial Policy (STIIP) Data Portal is a new resource designed to enhance understanding of China's innovation ecosystem. In light of China's growing influence in global science and technology, and the opacity of its policy environment, the portal offers structured, high-quality data to support research and policy analysis.

The portal includes two key components: a policy document visualization tool that maps national and subnational STI policies across time, region, and topic; and a profiling database of approximately 2,000 state-endorsed innovation entities, detailing their location, research focus, and participation in national S&T programs.

Together, these tools help users trace policy trends, identify key innovation actors, and assess China's industrial strategy. The data supports analysis of U.S.–China competition, international collaboration, and industrial policy responses. Access is available to authorized users.
By improving transparency and enabling evidence-based insights, the STIIP Portal offers an essential foundation for understanding China's approach to technological self-reliance and its broader implications for global science and innovation policy.

China's S&T Plans as a Coordination System: A Topic Model Approach | Barry Naughton

This presentation analyzes the evolution and structure of China's national science and technology (S&T) planning system, which developed rapidly between 2011 and 2021 into a comprehensive, hierarchical framework spanning national, provincial, and local levels. Drawing on structural topic modeling of hundreds of S&T plans, the study identifies 74 core topics grouped into technology and policy clusters, enabling a detailed assessment of shifting priorities across China's S&T agenda.

Key findings highlight a pronounced strategic pivot toward frontier technologies—particularly artificial intelligence, which now constitutes 25% of the technology priority category. Meanwhile, traditional mechanical sectors such as heavy equipment and industrial chemistry have declined sharply. In the policy realm, there has been a strong move toward increased top-down control through monitoring and evaluation mechanisms, coupled with a significant retreat from socially engaged and market-compatible instruments.

The authors find that while planning has become more rationalized and centralized, it may also be less adaptive, with signs of tension and inefficiency emerging within the system. Notably, major national shifts—such as the post-2020 emphasis on self-reliance—have not yet been meaningfully incorporated into S&T plan content. The presentation concludes with open questions about the dynamics of idea generation, regional differentiation, and the relationship between planning inputs and scientific or economic outcomes.

SPEAKER BIOGRAPHIES

Tai Ming Cheung is director of the University of California Institute on Global Conflict and Cooperation and a professor at the School of Global Policy and Strategy at UC San Diego, where he teaches on China's international relations, national security, and technology policy. His research focuses include China's efforts to become a world-class science and technology power and the relationship between geoeconomics, innovation, and national security. Cheung is a long-time analyst of Chinese and East Asian defense and national security affairs, especially defense economic, industrial and science, and technological issues. He is the author of *Innovate to Dominate: The Rise of the Chinese Techno-Security State* (2022) and *Fortifying China: The Struggle to Build a Modern Defense Economy* (2009), co-editor of *The Gathering Pacific Storm: Emerging US-China Strategic Competition in Defense Technological and Industrial Development* (2018), and editor of *Forging China's Military Might: A New Framework for Assessing Innovation* (2014). He was

based in Hong Kong, China, and Japan from the mid-1980s to 2002 covering political, economic, and strategic developments as a journalist for the *Far Eastern Economic Review* from 1988–1993 and subsequently as a risk consultant, including for PricewaterhouseCoopers. Cheung has a PhD in war studies from King's College London.

Laura Gormley is a Senior Research Analyst with Rhodium Group's China Projects Team, where she focuses on China's industrial and economic security policy, and outbound economic engagement. Prior to joining Rhodium, she worked at the Global Development Policy Center's Global China Initiative at Boston University, researching China's development finance and outbound funding for clean energy. Laura has three years of experience working and studying in China. She holds a master's degree in global development policy from Boston University's Pardee School of Global Studies and a bachelor's degree in development economics from McGill University.

Jeroen Groenewegen-Lau is Head of Program of "Science, Technology and Innovation" at the Mercator Institute for China Studies (MERICS). He has published reports on China's S&T systems, quantum technology and biotechnology. Prior to MERICS, Jeroen worked at "China Policy", a Beijing-based research and advisory company. He set up the section education, science and innovation at China Policy in 2017, and led it until December 2020. Jeroen spent over ten years in China. He holds a master's degree Languages and Cultures of China from Leiden University and wrote about Chinese popular music in his PhD dissertation.

Lei Guang is the So Family Executive Director of the 21st Century China Center at UC San Diego's School of Global Policy and Strategy. He received his Ph.D. in political science from the University of Minnesota and is professor emeritus of political science at San Diego State University. His scholarly research has focused on the Chinese state and society, political economy and U.S.-China relations. He has also written on Indian politics, including China-India relations. He is on the editorial boards of The China Quarterly and The China Journal, two leading academic journals on China. He has held postdoctoral and other research appointments at Stanford (CEAS), Yale (Agrarian Studies), Jawaharlal Nehru University in India and Tsinghua University in China.

Jennifer Hendrixson White is a leading expert on national security issues related to China and the Indo-Pacific, foreign affairs and defense, international trade and economics, cyber, AI and emerging technologies. Jennifer served in senior positions across the U.S. government from 2010 to 2025, working on a broad range of Asian security, economic, and technology issues at the State Department, the U.S. Mission to the United Nations, the U.S. House of Representatives, and the U.S. Senate, as well as stints at the Pentagon, USINDOPACOM, and the National Security Council. Throughout her career, Jennifer has worked closely with corporate executives, trade associations, nonprofits, think tank experts and foreign governments to solve their most pressing political and economic challenges. As a senior advisor to two former Chairmen of the Senate Foreign Relations Committee and a former Chairman of the House Foreign Affairs Committee, Jennifer's leadership was critical in the passage of major bipartisan legislation, including the landmark Australia–UK–U.S. (AUKUS) Security Partnership; the 20-year renewal of the Compacts of Free Association enabling U.S. military access in the Western Pacific; and sanctions on the North Korean regime in Title III of the Countering American Adversaries through Sanctions Act (CAATSA) of 2017. In addition, she drafted and negotiated complex bipartisan legislation to eliminate double-taxation for businesses in the U.S. and Taiwan and facilitate investment in the United States, including on advanced semiconductors. Ms. White is the Founder and Managing Partner of Scalare Advisors, a firm that offers advisory services for businesses and organizations looking to understand the complex legislative, regulatory and policy landscape in Washington and an Adjunct Senior Fellow at the Center for New American Security. Jennifer has studied and worked in China and Southeast Asia, and earned a Master of Arts degree from the Johns Hopkins School of International Studies, where she focused on China, Southeast Asia and International Economics.

Michael Laha is the Senior Research Fellow for China and technology policy at the German Council on Foreign Relations (DGAP) in Berlin. Previously, he worked as a consultant at Sinolytics, a European research-based consultancy entirely focused on China. He was a 2021-22 Alexander von Humboldt Foundation German Chancellor Fellowship based at the Mercator Institute for China Studies (MERICS). Before that he worked at the Asia Society Center on U.S.-China Relations where he most recently was a Senior Program Officer and where he also served as the ChinaFile Books Editor. He conducts research on China's science, technology, and innovation policy, the role of China in the transatlantic relationship, and China's governance model. He holds a M.A. in East Asian Languages and Cultures from Columbia University and B.S. in Chemistry from Tufts University. He is fluent in German and proficient in Chinese.

Barry Naughton co-leads IGCC research on Chinese science, technology, innovation, and industrial policy. He is the So Kwanlok chair of Chinese international affairs at the School of Global Policy and Strategy at UC San Diego, and one of the world's most highly respected economists working on China. He is an authority on the Chinese economy with an emphasis on issues relating to industry, trade, finance, and China's transition to a market economy. Naughton has written the authoritative textbook *The Chinese Economy: Transitions and Growth*, which has now been translated into Chinese. His groundbreaking book, *Growing Out of the Plan: Chinese Economic Reform, 1978-1993,* received the Ohira Memorial Prize.

Yang (Young) Yang is a research data analyst at the China Data Lab, where he manages the center's databases, consults with faculty about data-related projects, and crafts data visualization blogs. His research interests fall into how new information technologies combined with government and platform policies influence individuals' and organizations' decision-making processes. He received his PhD from the School of Management at Zhejiang University and was a research scientist at Yale School of Public Health, working on research on smart health and medical reforms in China.

Zhuohan Fang is a Research Associate at the UC Institute on Global Conflict and Cooperation (IGCC), specializing in China's industrial policy and international trade. Her research focuses on the intersection of global value chains, clean energy, and China's efforts to restructure its strategic sectors. Zhuohan holds a Master's degree in Chinese Economic and Political Affairs from UC San Diego's School of Global Policy and Strategy and a Bachelor's in Agricultural Economics from Zhejiang University. She employs empirical tools, including causal inference, trade data visualization, and geospatial analysis, to investigate China's policy-driven shifts in industrial upgrading and import and export dynamics.