THE PENN PROJECT ON
THE FUTURE OF U.S.-CHINA RELATIONS

# TECHNOLOGY:
# FINDINGS AND RECOMMENDATIONS

*The Penn Project on the Future of U.S.-China Relations presents the following findings and recommendations from the Technology team of its second fellowship cohort. The policy papers on which they are based, a video of the February 6 webinar featuring these authors, and more information can be found on the Project website.*

## Assessing China's Innovation Ecosystem in Strategic and Emerging Technologies

AJ Cortese, MacroPolo, The Paulson Institute

Findings:

1. China's expansive and increasingly opaque industrial strategies, particularly those driven by local governments, create significant challenges for US ability to accurately assess Chinese technological progress. A comprehensive monitoring system for overcoming these challenges is lacking.
2. Reactive responses to technology competition are less effective and support a narrower suite of countermeasures. They are also inherently escalatory as they are perceived to be punitive. Moreover, by the time Chinese companies control sizeable global market share in key technology verticals, the optimal window of opportunity to bolster US competitiveness has already passed.
3. Examination of successful Chinese tech clusters shows that key indicators of innovation originate at the municipal level, driven by the alignment between local officials, academic institutions, and corporate entities. Focusing attention here can shed important light on the ability of high-tech enterprises to navigate the commercialization "valley of death", the crucial period when companies attempt to marketize research breakthroughs and innovations.

Recommendations:

1. U.S. policymakers should take a proactive approach by establishing a holistic framework for analyzing Chinese innovation clusters down to the municipal level, monitoring i) local official mobility to discern technocratic successes, ii) subject-specific STEM talent flows into geospecific clusters, and ii ) startup and corporate activity with a focus on supply chain and technology stack mapping of supplier-customer relationships.
2. We should strengthen necessary links between US companies, academic researchers, and government to develop more holistic and anticipatory understandings of Chinese progress at each stage in the innovation chain, extending this approach into multilateral dialogues as well.
3. Washington should disaggregate competition with China to avoid widespread decoupling, which would significantly reduce available information on Chinese capabilities, and likewise support collaborations at the academic and research levels, with appropriate national security safeguards in place.

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# A Diffusion-Centered View of U.S.-China Technological Competition

Jeffrey Ding, George Washington University

Findings:

1. In their pursuit of leadership over frontier technologies, Chinese and American leaders similarly overlook that diffusion — how innovations spread and are adopted — is essential to the success of even the most extraordinary technological advances.

2. A country's ability to embrace technologies at scale is especially important for technologies such as electricity and AI — foundational advances that boost productivity only after many sectors of the economy begin to use them. Productivity leadership matters because a state's ability to sustain high growth rates in the long-term is foundational to geopolitical and military influence.

3. It matters less which country first introduces a major innovation and more which countries adopt and spread those innovations. The real determining factor in international competition is a country's capacity to diffuse AI advances across a wide range of industries — a gradual process that will likely play out over decades.

Recommendations:

1. The U.S. should reconsider policies such as denying visas to Chinese graduate students in advanced technical fields or imposing export controls on high-end chips for training large models, which are designed to monopolize foundational innovations.

2. Instead of over-indexing on technological leakage, U.S. policymakers should prioritize improving and sustaining the rate at which AI becomes embedded in a wide range of productive processes. One straightforward step would be for Congress to exercise stronger oversight on implementation and funding authorization under the CHIPS and Science Act's workforce initiatives expanding training in STEM fields.

3. Washington should focus on policies directed at broadening the talent pool, such as providing community colleges with greater backing to train an AI-savvy workforce. Investments in applied technology centers, dedicated field services, and other technology diffusion institutions can also encourage the adoption of AI techniques by small and medium-sized enterprises.