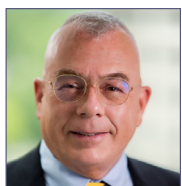




PRC INTENDS TO BOOST ROLE IN **SOLAR RADIATION MODIFICATION**



ABOUT THE AUTHOR



DR. RAY BOWEN, SR. FELLOW, TRADE AND INVESTMENT SECURITY has devoted his career spanning five decades to the study of international economy and policy, including the global emergence of Asian economies. Ray has served in academic, government, and private sector roles, in the US and abroad, and continues to serve in both the private and academic sectors. His work—which has included support to the Committee on Foreign Investment in the United States (CFIUS) security assessment process, and to trade investigations—focuses on collection, analysis, and reporting of government strategies and trends in international trade and investment policy and risk review, including both the U.S.’ and foreign nations’ reactions, and related technology policies. His experience observing and analyzing the institutions of key foreign actors enables him to provide U.S. policy audiences in both the public and private sectors with timely and actionable insights. Ray earned his Bachelor of Science in Economics at the University of Wisconsin, and his Ph.D. in Economics at the University of Michigan.

ABOUT ACCF CENTER FOR POLICY RESEARCH

The American Council for Capital Formation Center for Policy Research brings together academics, policymakers, business leaders and the media to focus on important new research on economic, energy, environment, regulatory, tax, and trade policies. Our endeavors are focused on policies to increase U.S. economic growth, job creation, and competitiveness. Center publications are circulated widely in the U.S. policymaking community and at international policy conferences. Since 1977, the ACCF Center for Policy Research has welcomed leading economists as members of its board of scholars. This distinguished board includes several Nobel Prize winners, members of the Presidential Council of Economic Advisers, Congressional Budget Office, U.S. Treasury consultants, and Federal Reserve board members.

FOREWORD



In February 2026, the American Council for Capital Formation published The National Security Case for U.S. Leadership in SRM Technology. That report argued that solar radiation management

(SRM, *aka* solar radiation modification) is no longer a fringe scientific concept but an emerging strategic domain—one in which technological capacity, research leadership, and governance influence will shape national power and global security. It noted that China’s expansive weather-modification infrastructure, Military-Civil Fusion strategy, and growing atmospheric research capacity created competitive and dual-use risks that the United States could not ignore.

Some observers questioned whether the evidence of Chinese seriousness on SRM was sufficient, suggesting Beijing’s efforts were better understood as defensive climate adaptation and that competitive framing risked being counter-productive. Those critiques deserved careful consideration.

This report provides important new evidence. Drawing on open-source Chinese-language materials largely unreported in English until now, it documents a clear qualitative shift: from earlier, broad exploratory work on geoengineering approaches to a larger, more focused national research program dedicated specifically to SRM.

Under the 14th Five-Year Plan, the Ministry of Science and Technology more than doubled dedicated funding for SRM-focused research projects relative to the prior entire weather and climate change research programs. Project stewardship has been elevated to institutions directly accountable to the CCP Central Committee and State Council, including the Chinese Academy of Sciences’ Institute of Atmospheric Physics and a United Front Work Department-administered university charged with talent acquisition. Chinese researchers associated with these efforts have called for elevating geo-engineering from a climate-security issue to a national-security priority and for China to play

a leading role in multilateral frameworks. This year, Beijing further moved to institutionalize coordination through a new “International Alliance for Solar Radiation Modification,” which was announced at a conference hosted by a key central state-owned enterprise.

These steps are consistent with the same portfolio of national development strategies—talent recruitment, standards-setting, institutional elevation, and governance influence—that Beijing has applied to other technologies it regards as strategic. They indicate that SRM is being treated as more than a peripheral scientific interest.

None of this means the United States should rush toward deployment. Responsible research, rigorous risk assessment, and transparent governance remain essential. But the alternative to U.S. and allied leadership is not a neutral, benign vacuum. It is a field increasingly shaped by an actor that is investing in focused SRM capabilities and seeking influence over related standards and governance. ACCF’s earlier report argued that the window for democratic leadership was open but finite. The developments documented here suggest that window is narrowing.

This report is offered in that spirit: not as alarmism, but as evidence-based urgency. The United States and its partners should expand domestic research capacity, strengthen coordination with allies, and engage seriously in the still-underdeveloped domain of SRM standards and governance. Strategic technologies do not wait for consensus. They reward those who prepare.

George David Banks

A handwritten signature in black ink, appearing to read "George Banks", written in a cursive style.

**President & CEO American
Council for Capital Formation**
August 2026

PRC INTENDS TO BOOST ROLE IN SOLAR RADIATION MODIFICATION

-- BEIJING SHARPLY INCREASES R&D RESOURCING AND PROPOSES INTERNATIONAL INITIATIVES

DR. RAY BOWEN • AUGUST 2026

SUMMARY

During 2024, Beijing sharply increased its resourcing of the development and control over solar radiation modification (aka solar radiation management, hereafter SRM), indicating that Beijing intends to further boost China's already nearly 15 years-long focus and role in "stratospheric geoengineering" research and development (R&D), standard setting, and governance, judging from open source reports in authoritative People's Republic of China (PRC) media. Unreported heretofore in English-language media or academic journals, in a 2024 guide to application for the "earth system and global change key special program" research funding, **the PRC Ministry of Science and Technology (MoST) significantly increased funding allocated specifically for projects focused on SRM—among other topics—compared to the PRC budget for geoengineering theory and impact research begun during the previous decade.**

This funding boost—together with the comments and activities of PRC researchers working in the PRC and abroad—**strongly signal the PRC's recognition that SRM is an emerging critical technology** likely to present both great opportunity as well as challenges. Beijing applies the same portfolio of national "development strategies" to geoengineering R&D as those which it has deployed during recent decades to appropriate and pursue the lead in other "key core technologies" in "strategic emerging industries," as well as to shape and gain influence over global governance mechanisms. These developments suggest that nonPRC stakeholders hoping to play leading roles in the future of key climate technologies such as SRM should take note of the PRC's SRM initiatives, as well as consider increasing their own and their allies' focus and engagement to address the current dearth of meaningful and effective global standards, regulation, and governance of the realm.

PRC STEPPED-UP BUDGETING FOR

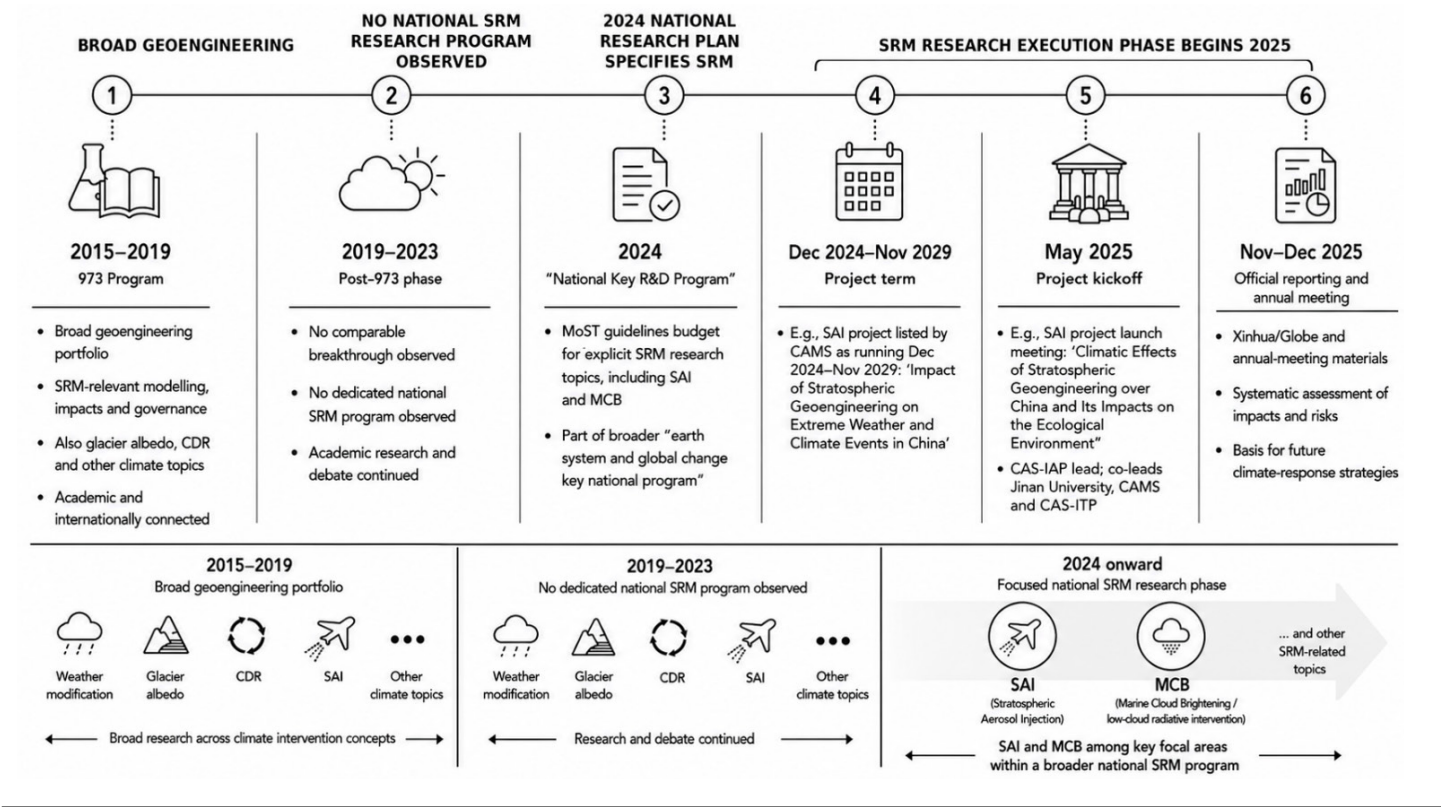
AND FOCUS ON SRM RESEARCH
BEGINNING IN 2024

Marking a substantial shift from the more general 2015-2019-era weather and climate change work, the application guidelines for the PRC Ministry of Science and Technology (MoST) 2024 “earth systems and global change” key special program under the 14th Five Year Plan (14FYP) National Key R&D Program specifically designate research into SRM, including SAI, in two out of its twenty-eight research topics.¹ The guidelines state that the PRC government budgeted 20 million Renminbi (RMB) for each of the SRM topics, RMB 40 million in total for SRM research—which is well over 5 million U.S. dollars at nominal 2024 exchange rates, and

probably worth much more in purchasing power parity terms.²

RMB 40 million funding for the two SRM-focused research projects in the 2024 “earth systems and global change” key special program represents well over double the approximately RMB 14.5 million budgeted for “Research on the Fundamental Theory and Impact Assessment of Geoengineering” under the predecessor “973 National Basic Research Program” begun in 2015, which encompassed a wide range of geoengineering approaches, including stratospheric aerosol injection (SAI), glacial albedo modification, and carbon dioxide removal (CDR).^{3 4 5} By comparison, the project topics “Climatic Effects of Stratospheric Geoengineering and Their Impacts

FIGURE 1 The PRC's path to its dedicated SRM national research projects spans the past decade.



¹ “地球系统与全球变化”重点专项2024年度项目申报指南 [2024 Project Application Guidelines for the ‘Earth System and Global Change’ Key Special Program], apparently posted 2023 by HK City University’s Shenzhen Research Institute, observed May 26, 2026 at: <http://119.23.232.167:8888/SRManager/upload/20240725155113619/%E2%80%9C%E5%9C%B0%E7%90%83%E7%B3%BB%E7%BB%9F%E4%B8%8E%E5%85%A8%E7%90%83%E5%8F%98%E5%8C%96%E2%80%9D%E9%87%8D%E7%82%B9%E4%B8%93%E9%A1%B92024%E5%B9%B4%E5%BA%A6%E9%A1%B9%E7%9B%AE%E7%94%B3%E6%8A%A5%E6%8C%87%E5%8D%97.pdf>

² Calculated at 0.1393 USD per 1 yuan Renminbi (or RMB 7.18 yuan per US dollar), which is the average exchange rate between the two currencies during the year 2024 according to UK currency information website, observed June 25 2026 at: <https://www.exchangerates.org.uk/CNY-USD-spot-exchange-rates-history-2024.html>

³ 中华人民共和国科学技术部 [Ministry of Science and Technology (MoST) of the PRC]: “国家重点基础研究发展计划2015年项目清单 [List of Projects under the National Key Basic Research Development Program (2015)],” posted March 11, 2015 on the official website of the 中华人民共和国科学技术部 [Ministry of Science and Technology (MoST) of the PRC], and observed July 28, 2026 at: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fmost.gov.cn%2Fxxgk%2Fxinixifenlei%2Fdzdgn-r%2Fqtjw%2Fqtjw2015%2F201503%2FW020150311625011096744.doc&wdOrigin=BROWSELINK>

⁴ 王灿 实习生 张静 [Wang Can; Intern Zhang Jing]: “中国拨款1448万设地球工程国家研究项目，旨在为地球降温 [China allocates 14.48 million yuan for a national geoengineering research project aimed at cooling the Earth],” posted August 6, 2017 on the website of 澎湃新闻 [The Paper], observed June 19, 2026 at: https://m.thepaper.cn/newsDetail_forward_1753236

⁵ Cumulative Renminbi inflation during 2015 through 2024 was 15.31 percent according to the China Inflation Rate Calculator webpage provided by the California-based nonprofit Official Data Foundation---observed June 25, 2026 at: <https://www.in2013dollars.com/china/inflation/2015?endYear=2024&amount=100> ---and computed based on World Bank data observed June 25, 2026 at: <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?end=2024&locations=CN&start=2015>

on the Ecological Environment,” and “Research on the Theory and Technology of Low-Cloud Radiative Intervention Geoengineering and Its Climatic Effects” within the 2024 “earth systems and global change” key special program more directly target research on SRM (note that the Chinese language terms for “stratospheric geoengineering” and “stratospheric aerosol injection (SAI)” appear to be used interchangeably in the “2024 Project Application Guidelines for the ‘Earth System and Global Change’ Key Special Program,” and other Chinese language documents; SAI is generally understood by the global scientific community to refer to the dispersal of reflective aerosols into the stratosphere).⁶ The significance lies not only in the larger 2024

budget compared to the 2015 budget, but in the narrower focus: the 2015-initiated programs treated SRM as one component of broad geoengineering research, whereas the 2024-initiated programs establish two dedicated SRM projects specifically addressing stratospheric aerosol injection and low-cloud radiative intervention.

Beijing also appears to have shifted stewardship of the 2024 key special program projects to higher level PRC institutions—away from the Chinese Academy of Social Sciences (CASS) and Beijing Normal University, and away from foreigners such as UK scientist John Moore, who had played high-profile roles in the 2015-2019 “973 National Basic Research Program.”⁸

FIGURE 2 Section 4.2 excerpted from the MoST “2024 Project Application Guidelines for the ‘Earth System and Global Change’ Key Special Program.”⁷ The excerpt shows one of the two SRM-focused topics in the 2024 program - stratospheric geoengineering (RMB 20 million); the program separately lists the low-cloud radiative intervention topic at the same funding level.

4.2 平流层地球工程的气候效应及对生态环境的影响 研究内容: 构建不同的平流层气溶胶注入地球工程方案, 模拟分析中国水热配置和极端气候的响应与主要物理过程; 研究平流层地球工程对中国陆地生态环境格局和功能的影响与机制; 集成多源代用资料, 结合数值试验, 研究过去千年火山爆发(平流层人为气溶胶注入的自然类比)背景下中国气候和陆地生态环境的变化及机理; 综合比较自然火山爆发与平流层地球工程气候和生态影响的异同, 评估平流层地球工程的潜在风险及不确定性。 考核指标: 建立不同的平流层气溶胶注入方案(时间、地点和路径)试验数据集; 给出平流层地球工程方案下中国水热配置、极端气候(高温、干旱等)、陆地生态环境(植被、农作物等)响应的空间特征, 空间分辨率不低于 50 km; 绘制过去千年火山爆发后中国温度、降水、植被等变化的空间分布图; 构建平流层地球工程影响中国气候-生态-环境的综合物理模型; 完成气候干预决策咨询建议1份。 有关说明: 研究结果、数据须按照科技部的相关规定进行数据汇交、开放共享。国拨经费概算参考数约2000万元。 关键词: 平流层地球工程, 火山爆发, 水热配置, 陆地生态环境, 动力学机制	4.2 Climatic Effects of Stratospheric Geoengineering and Their Impacts on the Ecological Environment Research Content: Formulate various stratospheric aerosol injection geoengineering schemes; simulate and analyze the responses of China's hydrothermal regime and extreme climate events, as well as the underlying physical processes involved; investigate the impacts and mechanisms of stratospheric geoengineering on the patterns and functions of China's terrestrial ecological environment; integrate multi-source proxy data and combine them with numerical experiments to study the changes and mechanisms of China's climate and terrestrial ecological environment against the backdrop of volcanic eruptions over the past millennium (serving as a natural analogue for anthropogenic stratospheric aerosol injection); comprehensively compare the similarities and differences between the climatic and ecological impacts of natural volcanic eruptions versus stratospheric geoengineering; and assess the potential risks and uncertainties associated with stratospheric geoengineering. Assessment Indicators: Establish experimental datasets for various stratospheric aerosol injection schemes (specifying timing, location, and trajectory); characterize the spatial features of the responses of China's hydrothermal regime, extreme climate events (e.g., high temperatures, droughts), and terrestrial ecological environment (e.g., vegetation, crops) under the proposed stratospheric geoengineering schemes, with a spatial resolution of no less than 50 km; generate spatial distribution maps illustrating the changes in temperature, precipitation, vegetation, and other variables across China following volcanic eruptions over the past millennium; construct a comprehensive physical model to simulate the impacts of stratospheric geoengineering on China's climate-ecology-environment system; and produce one set of advisory recommendations for climate intervention decision-making. Relevant Notes: Research results and data must be submitted and openly shared in accordance with the relevant regulations of the Ministry of Science and Technology. The estimated reference figure for state-allocated funding is approximately 20 million RMB. Keywords: stratospheric geoengineering, volcanic eruptions, hydrothermal configuration, terrestrial ecological environment, dynamic mechanisms
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Original Chinese text of 4.2 section

English translation of 4.2 Section

⁶ “‘地球系统与全球变化’重点专项2024 年度项目申报指南 [2024 Project Application Guidelines for the ‘Earth System and Global Change’ Key Special Program],” apparently posted 2023 by HK City University’s Shenzhen Research Institute, observed May 26, 2026 at: <http://119.23.232.167:8888/SRManager/upload/20240725155113619/%E2%80%9C%E5%9C%B0%E7%90%83%E7%B3%BB%E7%BB%9F%E4%B8%8E%E5%85%A8%E7%90%83%E5%8F%98%E5%8C%96%E2%80%9D%E9%87%8D%E7%82%B9%E4%B8%93%E9%A1%B92024%E5%B9%B4%E5%BA%A6%E9%A1%B9%E7%9B%AE%E7%94%B3%E6%8A%A5%E6%8C%87%E5%8D%97.pdf>.

⁷ “‘地球系统与全球变化’重点专项2024 年度项目申报指南 [2024 Project Application Guidelines for the ‘Earth System and Global Change’ Key Special Program],” apparently posted 2023 by HK City University’s Shenzhen Research Institute, observed May 26, 2026 at: <http://119.23.232.167:8888/SRManager/upload/20240725155113619/%E2%80%9C%E5%9C%B0%E7%90%83%E7%B3%BB%E7%BB%9F%E4%B8%8E%E5%85%A8%E7%90%83%E5%8F%98%E5%8C%96%E2%80%9D%E9%87%8D%E7%82%B9%E4%B8%93%E9%A1%B92024%E5%B9%B4%E5%BA%A6%E9%A1%B9%E7%9B%AE%E7%94%B3%E6%8A%A5%E6%8C%87%E5%8D%97.pdf>

The PRC State Council's Chinese Academy of Sciences' Institute of Atmospheric Physics (CAS IAP) hosted a launch and implementation meeting in Beijing on May 7, 2025 and—together with its co-lead Jinan University—cohosted an annual meeting in Guangzhou on December 22, 2025 for a “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment,” project.^{9,10} According to the reports about the meetings, the project leadership appears to be completely comprised of PRC scientists. The project includes four different tasks led by PRC researchers, dealing with—among other things—stratospheric aerosol processes, climate response under SAI

conditions, ecological impacts, as well as volcanic eruptions analogs.

At the launch and implementation meeting, “Climatic Effects of Stratospheric Geoengineering . . .” project participant Zhang Feng “emphasized that, in light of the uncertainties regarding climate change and the ecological environment associated with geoengineering, the project team should strive to produce research results of strategic value, thereby providing a scientific basis and theoretical support for relevant national decision-making and planning.”¹² At the same project's first annual meeting in Guangzhou on December 22, 2025, the principle investigator

FIGURE 3 Group photograph of attending experts, leaders, and the research team at the “Launch Ceremony and Implementation Plan Review Meeting Held for the ‘earth system and global change key special program’ project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment.’” Source: CAS IAP.¹¹



- ⁸ 王灿 实习生 张静 [Wang Can; Intern Zhang Jing]: “中国拨款1448万设地球工程国家研究项目，旨在为地球降温 [China allocates 14.48 million yuan for a national geoengineering research project aimed at cooling the Earth],” posted August 6, 2017 on the website of 澎湃新闻 [The Paper], observed June 19, 2026 at: https://m.thepaper.cn/newsDetail_forward_175323
- ⁹ 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目启动暨实施方案论证会召开 [Launch Ceremony and Implementation Plan Review Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted May 9, 2025 on the 综合新闻 [General News] webpage of the official website of the 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics], observed May 27, 2026 at: https://iap.cas.cn/gb/xwdt/zhxw/202505/t20250509_7649371.html
- ¹⁰ 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html
- ¹¹ 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目启动暨实施方案论证会召开 [Launch Ceremony and Implementation Plan Review Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted May 9, 2025 on the 综合新闻 [General News] webpage of the official website of the 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics], observed May 27, 2026 at: https://iap.cas.cn/gb/xwdt/zhxw/202505/t20250509_7649371.html
- ¹² 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目启动暨实施方案论证会召开 [Launch Ceremony and Implementation Plan Review Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted May 9, 2025 on the 综合新闻 [General News] webpage of the official website of the 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics], observed May 27, 2026 at: https://iap.cas.cn/gb/xwdt/zhxw/202505/t20250509_7649371.html

emphasized “the importance of strengthening cross-sub-project collaboration and resource integration, and outlining a systematic plan for the work to be undertaken in the next phase.”¹³

During late 2024, PRC national authorities approved the establishment of the “State Key Laboratory of Climate System Prediction and Risk Management (CPRM).” The lab is a national-level research platform, jointly operated by the Nanjing University of Information Science and Technology (NUIST), Nanjing Normal University (NNU), and the National Climate Center

(NCC), according to reporting by NUIST and the “Laboratory Overview” posted on the lab’s webpage on NUIST’s website.^{15 16} The lab—possibly increasing the PRC’s capacity to research SRM along with other climate system topics—held its inaugural meeting on March 22, 2025.¹⁷

Notably, however, there is no mention of SRM or stratospheric geoengineering—much less of the “‘Earth System and Global Change’ Key Special Program”—in several major reports, such as the 2025 annual report on China’s policies and actions for addressing climate change from the

Figure 4 Group photo of participants at the “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment” 2025 Annual Meeting. Source: State Key Laboratory of Earth System Numerical Modeling and Application.¹⁴



¹³ 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025 年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html.

¹⁴ 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html.

¹⁵ 南京信息工程大学 [Nanjing University of Information Science and Technology]: “中国大气科学领域国家级重点实验室建设推进会暨第一届学术委员会第一次会议召开 [Meeting on Advancing the Construction of National Key Laboratories in China’s Atmospheric Science Sector and the First Meeting of the First Academic Committee Convened],” posted on the 天际新闻网 [The Skyline] news webpage on the official website of the 南京信息工程大学 [Nanjing University of Information Science and Technology], rehosted by 百度 [Baidu] as a screenshot, observed June 30, 2026 archived at: https://baike.baidu.com/reference/65518530/533aYdO6cr3_z3kATKCOxfSkY3zHM4ykvOLRU7tzzqIPmGapB5ngW-Jt87sl27eMpEQ_e_ptsl-kGx7_ICEtH6-gQcu83XeYjnHX8AJHKzb_j_sZxy4YRvcoAGA.

¹⁶ 气候系统预测与变化应对国家重点实验室 [State Key Laboratory of Climate System Prediction and Response to Climate Change [‘State Key Laboratory of Climate System Prediction and Risk Management’ (CPRM)]]: “实验室简介 [Laboratory Overview],” undated webpage on the Laboratory’s webpages on the official website of 南京信息工程大学 [Nanjing University of Information Science and Technology], observed July 15, 2026 at: <https://cprm.nuist.edu.cn/sysgk/sysjj.htm>.

¹⁷ 南京信息工程大学 [Nanjing University of Information Science and Technology]: “南京信息工程大学获批国家重点实验室 [Nanjing University of Information Science and Technology Approved to Establish a National Key Laboratory],” rehosted from the 南京信息工程大学 [Nanjing University of Information Science and Technology] on a PRC national college entrance exam preparation website 高考直通车 [Gaokao Express], and observed June 30, 2026 at: <https://app.gaokaozhitongche.com/newsguide/h/wgBqxjBX>.

“[The PRC’s] recently initiated key research and development project, ‘The Climate Effects of Stratospheric Geoengineering in China and its Impact on the Ecological Environment,’ is dedicated to systematically assessing the potential impacts and risks of this technology application, providing a scientific basis for future climate-change response strategies.”

—Zhou Baiquan and Zhai Panmao, Xinhua News Agency’s “Globe” magazine, November 24, 2025.¹⁹ Zhai Panmao is a Research Fellow at the Chinese Academy of Meteorological Sciences, and is the project tracking expert for the “earth system and global change key special program” project: “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment.”^{20 21}

“We need an effective geoengineering project to slow down global warming and buy valuable time for global efforts in greenhouse gas emission reduction. We propose submitting to the United Nations a feasibility study on the injection of aerosols into the stratosphere. [...] I think that China has a considerable advantage in pushing for grand scale engineering projects such as this and it will improve our global standing in the efforts to address climate change.”

—Liu Shaochen, National Science Review, April 2024.²² Liu is “Project Advisory Expert” for the “earth system and global change key special program” project: “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment.” and a Professor and Leader of the Atmospheric Chemistry and Climate Change Team, Jinan University—which is one of the CAS IAP led project’s three co-lead institutions.²³ Liu’s comment explicitly advocates for more geoengineering funding and presents China as well placed for large-scale geoengineering.

PRC Ministry of Ecology and Environment.¹⁸

TOP AGENCIES ASSIGNED TO STEWARD “EARTH SYSTEM AND GLOBAL CHANGE” SRM PROJECTS

The agencies which Beijing assigned to steward the 2024 “earth system and global change key special program” stratospheric geoengineering research project encompassing SRM—as well as agencies more broadly delegated the task of

“developing weather modification”—are among the highest agencies of the Communist Party of China (CPC, aka “Chinese Communist Party,” “Party,” or “CCP”) and the PRC central government ruled by the CCP. According to CAS IAP’s May 2025 report on the project launch and implementation meeting in Beijing, the four co-leads of the “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment,” project include CAS IAP, Jinan University, the Chinese Academy of Meteorological

¹⁸ 中华人民共和国生态环境部 [Ministry of Ecology and Environment of the People’s Republic of China]: “中国应对气候变化的政策与行动 2025 年度报告 [China’s Policies and Actions for Addressing Climate Change: 2025 Annual Report],” posted October 2025 on the official website of the 中华人民共和国生态环境部 [Ministry of Ecology and Environment of the People’s Republic of China], and observed July 24 2026 at: <https://www.mee.gov.cn/ywqz/ydqbhb/ysqtkz/202510/W020251029517340644930.pdf>.

¹⁹ 文/周佰铨 翟盘茂 [By Zhou Baiquan [中国气象科学研究院 副研究员, 硕士生导师] and Zhai Panmao [中国气象科学研究院 研究员, 博士生导师]]: “地球变暗了? [Is the Earth Dimming?],” posted November 24, 2025 on the official website of Xinhua News Agency’s 《环球》杂志 [Globe Magazine], observed May 27, 2026 at: <https://www.news.cn/globe/20251124/0009e75dd11f4b3e828b3ef6ce4acdff/c.html>

²⁰ 新华网 [Xinhuanet]: “‘碳路未来’智库成员: 翟盘茂个人简介 [Charting a Low-Carbon Future’ Think Tank Member: Zhai Panmao – Biography],” posted November 16, 2024 on the official website of the PRC government official wire service 新华网 [Xinhuanet], observed June 11, 2026 at: https://www.news.cn/fortune/2024-11/16/c_1212407417.htm.

²¹ 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html.

²² He Zhu (朱禾): “Geoengineering: proactive measures to tackle climate change,” published October 25 2023 by the National Science Review, Volume 11, Issue 4, April 2024, observed July 14, 2026 at: <https://academic.oup.com/nsr/article/11/4/nwad271/7330193?login=false>.

²³ 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用国家重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html.

“... [E]quatorial SAI could influence atmospheric circulation by modulating temperature gradients between the Northern and Southern Hemispheres and between the equator and the Arctic, thereby alleviating China’s long-standing north-south water resource imbalance.[...] As one of the most thoroughly studied geoengineering approaches, equatorial SAI not only helps rapidly mitigate global warming—buying a critical window of time for deep emissions reductions—but may also foster a more sustainable hydrological environment for water resource management in China.”

—Tsinghua University News report on a research article by Zhang Xiao, Fan Yuanchao, Jerry Tjiputra, Helene Muri and Chen Qiao published in *Communications Earth & Environment* (a Nature portfolio journal) September 2025^{24 25} Fan and Zhang are researchers at the Tsinghua University Shenzhen International Graduate School (SIGS) Institute of Environment and Ecology, while Chen is a researcher at the Chinese Academy of Sciences (CAS) Chongqing Institute of Green and Intelligent Technology.

Sciences (CAMS), and the CAS Institute of Tibet-an Plateau Research (CAS ITPR).²⁶

CAS IAP is directly responsible to the Central Committee of the CCP and to the PRC State Council, according to the self-introduction posted on its website.²⁷ The Central Committee of the CCP is the ruling party’s decision and command hub, while the PRC State Council is the nation’s highest government body. The CAMS is subordinate to the China Meteorological Administration (CMA)—which in turn is subordinate to the PRC State Council—according to the respective self-introductions of the Graduate

Division of CAMS, and of the CMA.^{28 29} Like CAS IAP, the CAS ITPR is directly responsible to the Central Committee of the CCP and to the PRC State Council.^{30 31}

The United Front Work Department (UFWD) of the CCP Central Committee directly administers Jinan University, according to the self-introduction posted on Jinan University’s website, and other reports—strongly indicating the CCP’s high prioritization of access to foreign research and scientific talent related to SRM.^{32 33} The UFWD is the CCP’s overarching arm for domestic and international outreach (influence), intelligence

²⁴ 深圳国际研究生院 [Shenzhen International Graduate School]: “深圳国际研究生院范远超团队合作揭示气候干预对中国水资源南北分异的差异化影响 [Collaborative research by Fan Yuan-chao’s team at the Shenzhen International Graduate School reveals the differential impacts of climate intervention on the north-south disparity of water resources in China],” posted September 8, 2025 on the academic news webpages of the official website of 清华大学 [Tsinghua University], and observed July 17, 2026 at: <https://www.tsinghua.edu.cn/info/1175/121088.htm>.

²⁵ Zhang, X., Fan, Y., Tjiputra, J. et al. “Divergent impacts of climate interventions on China’s north-south water divide,” published September 4, 2025 by *Communications Earth & Environment*, a Nature Portfolio journal 6, 736 (2025). <https://doi.org/10.1038/s43247-025-02708-0>, observed July 17, 2026 at: <https://www.nature.com/articles/s43247-025-02708-0>

²⁶ 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics]: “国家重点研发计划 ‘平流层地球工程的中国气候效应及对生态环境的影响’ 项目启动暨实施方案论证会召开 [Launch Ceremony and Implementation Plan Review Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted May 9, 2025 on the 综合新闻 [General News] webpage of the official website of the 中国科学院大气物理研究所 [Chinese Academy of Sciences Institute of Atmospheric Physics], observed May 27, 2026 at: https://iap.cas.cn/gb/xwdt/zhxw/202505/t20250509_7649371.html.

²⁷ “中国科学院简介 [Introduction to the Chinese Academy of Sciences],” undated, on the official website of the 中国科学院 [Chinese Academy of Sciences], observed June 1, 2026 at: https://www.cas.cn/zz/yk/202511/t20251104_5087407.shtml.

²⁸ 中国气象科学研究院 [Graduate Division of the Chinese Academy of Meteorological Sciences (CAMS)]: “关于我们 [About Us],” undated post on the official website of the 中国气象科学研究院 [Graduate Division of the CAMS], observed June 9, 2026 at <https://graduate.cams.cma.cn/Content/11.html>

²⁹ 中国气象局 [China Meteorological Administration (CMA)]—which was the Central Military Commission Meteorological Administration previous to announcement of the State Council’s stewardship in 1994—is subordinate to the State Council according to an April 24, 2019 screen shot of its “CMA Introduction” webpage archived by Baidu at https://baike.baidu.com/reference/1076429/533aYdO6cr3_z3kATPFYnf_ONY2WN9-qv72CW7VzzqIP0XOpX5nyFls_4Zk48eEpFwWE4sgzMcwCjvDICetE771CLLpuXbcinHF-UyyGy77n_tgxmNcrootEX6QUmam16xg.

³⁰ 中国科学院青藏高原研究所 [Chinese Academy of Sciences Institute of Tibetan Plateau Research]: “所况简介 [Brief Introduction to the Institute],” posted on the official website of the institute, observed June 19, 2026 at: https://itpcas.cas.cn/new_skjs/.

³¹ “中国科学院简介 [Introduction to the Chinese Academy of Sciences],” undated, on the official website of the 中国科学院 [Chinese Academy of Sciences], observed June 1, 2026 at: https://www.cas.cn/zz/yk/202511/t20251104_5087407.shtml.

³² “关于暨大 [About Jinan University],” undated, posted on the official website of 暨南大学 [Jinan University], observed May 27, 2026 at: <https://www.jnu.edu.cn/2514/list.htm>.

³³ 澎湃新闻记者 钟煜豪 [ThePaper reporter Zhong Yuhao]: “国家机构改革后，暨南大学归属中央统战部、国务院侨办领导 [Following the reform of state institutions, Jinan University was placed under the leadership of the United Front Work Department of the CPC Central Committee and the Overseas Chinese Affairs Office of the State Council],” posted June 29, 2018 by 澎湃新闻 [ThePaper]—which is controlled by the Communist Party of China Shanghai Municipal Party Committee-controlled (via the 上海报业集团 [Shanghai United Media Group])—and observed June 25, 2026 at: https://m.thepaper.cn/newsDetail_forward_2226510?spm=smcpc.content.content.11546128000117ZF7ZGW1.

collection and operations, and political action.³⁴ Jinan University is the only general arts and sciences university in the PRC directly administered by the CCP Central Committee UFWD—which took effect as a result of the Beijing’s 2018 institutional reform according to a report in CCP Shanghai Municipal Party Committee-controlled media—in part to delegate the university a lead role in advancing the CCP goals of tapping international scientific research and acquiring scientific talent.³⁵

RESEARCHERS SIGNAL PRC RECOGNITION THAT SRM TO PRESENT OPPORTUNITY, CHALLENGES

The presence of PRC researchers working on earth system and global change topics, including SRM in the PRC and abroad, strongly signal the PRC’s recognition that SRM is an emerging critical technology likely to present great opportunity. During recent years, several PRC scientists that focus on SRM-relevant topics have visited or worked in U.S. government agencies and research institutes conducting SRM research, as well as other labs. Some of those PRC scientists came from and/or returned to relevant professional posts in the PRC, including—but not limited to—the steward agencies

for the 2024 “earth system and global change key special program,” such as CAS IAP and Jinan University.

At the same time, a body of PRC reporting also acknowledges that SRM and—more broadly geoengineering—pose structural challenges that require global governance solutions, as-yet undeveloped and elusive. Advocates for Chinese SRM leadership recommend that the PRC seize the initiative, including by using PRC national-level policies to elevate the issue of geoengineering from the realm of climate security to that of national security and to drive international governance.

An article by scientists at the Chinese Academy of Social Sciences (CASS), for example, published during 2020 in a journal supervised by the MoST and the Shandong Provincial Department of Science and Technology observes that although geoengineering shows promising potential, the field “simultaneously introduces new risks, thereby giving rise to complex dilemmas regarding global governance.” The authors assert that “China should elevate the issue of geoengineering from the realm of climate security to that of national security,” use “national-level policies to serve as a driving force behind international governance” and “play a more prominent leadership role within the United Nations

“China should elevate the issue of geoengineering from the realm of climate security to that of national security,” use “national-level policies to serve as a driving force behind international governance” and “play a more prominent leadership role within the United Nations framework” . . . “[while] utilizing scientific consensus to drive political processes while seizing critical windows of opportunity.”

—Chen Ying and Shen Weiping “Global Governance of Geoengineering: Theory, Framework and China’s Strategies,” published October 2020 in the journal *China Population Resources & Environment* (volume 30, issue 8 of 2020, pages 1–12), which is supervised by the MoST and the Shandong Province Department of Science and Technology.³⁶

³⁴ Alex Joske, “The Party Speaks for You, Foreign interference and the Chinese Communist Party’s United Front System” Policy Brief Report 32, Australian Strategic Policy Institute, June 9, 2020, observed June 29, 2026 at https://s3-ap-southeast-2.amazonaws.com/ad-aspi/2020-06/The%20party%20speaks%20for%20you_0.pdf?gFHuXyYMR0XuD-QOs_6JSmrDyk7MralcN=

³⁵ 澎湃新闻记者 钟煜豪 [ThePaper reporter Zhong Yuhao]: “国家机构改革后，暨南大学归属中央统战部、国务院侨办领导 [Following the reform of state institutions, Jinan University was placed under the leadership of the United Front Work Department of the CPC Central Committee and the Overseas Chinese Affairs Office of the State Council.],” posted June 29, 2018 by 澎湃新闻 [ThePaper]—which is controlled by the Communist Party of China Shanghai Municipal Party Committee-controlled (via the 上海报业集团 [Shanghai United Media Group])—and observed June 25, 2026 at: https://m.thepaper.cn/newsDetail_forward_2226510?spm=smcpc.content.content.11546128000117ZF7ZGW1.

³⁶ 陈迎 [Chen Ying], 沈维萍 [Shen Weiping]: “地球工程的全球治理:理论、框架与中国应对 [Global Governance of Geoengineering: Theory, Framework and China’s Strategies],” published October 2020 in 中国人口 资源与环境 [China Population Resources & Environment]—supervised by the Ministry of Science and Technology (MoST) and the Department of Science and Technology of Shandong Province—and posted on the official website of the 中国社会科学院生态文明研究所 [Research Institute for Eco-civilization, Chinese Academy of Social Sciences], and observed April 14, 2026 at: <http://rieo.cssn.cn/yj/yjcg/202010/P020201209462078667019.pdf>.

framework” . . . “[while] utilizing scientific consensus to drive political processes while strategically seizing critical windows of opportunity.”³⁷

The CASS scientists called for the PRC to actively participate in shaping geoengineering governance through agencies such as the World Meteorological Organization (WMO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), the United Nations Office for Outer Space Affairs (UNOOSA), the United Nations Environment Programme (UNEP), and the Food and Agriculture Organization (FAO).

During the past decade, Beijing assigned the lead in its “China Standards” campaign to key steward ministries, commissions, and PLA departments. These bodies also liaised with and led influence operations targeting multinational and sectoral standards setting organizations, including appointing the lead officials of U.S., Canadian, French, German, and UK national

standards organizations to CCP advisory committees such as its “China Standardization Expert Committee,” and succeeding in heavily staffing the multilateral organizations—which are structured to depend on rotating volunteer service appointments from across relevant industries globally—with PRC personnel.

PRC documents touted China’s becoming “a permanent member of the ISO and IEC, and member nation in the ITU” and the successful inclusion of PRC technical standards in international agreements.^{38 39 40 41} The PRC’s proactive participation in the International Maritime Organization, may be another such measure.^{42 43} At the same time, given the relative absence of global governance over geoengineering, the PRC may also be posturing to seize the moral high ground regardless of future developments. An article in a publication of the PRC’s official news agency Xinhua described declining planetary albedo, its potential to contribute to global warming, and the possibility that stratospheric geoengineering could mitigate the declining planetary albedo but may also come with uncertain risks.⁴⁴ The article—published just before the December 2025 annual meeting of the “Climatic Effects

³⁷ 陈迎 [Chen Ying], 沈维萍 [Shen Weiping]: “地球工程的全球治理:理论、框架与中国应对 [Global Governance of Geoengineering: Theory, Framework and China’s Strategies],” published October 2020 in 中国人口资源与环境 [China Population Resources & Environment]—supervised by the Ministry of Science and Technology (MoST) and the Department of Science and Technology of Shandong Province—and posted on the official website of the 中国社会科学院生态文明研究所 [Research Institute for Eco-civilization, Chinese Academy of Social Sciences], and observed April 14, 2026 at: http://rieo.cssn.cn/yj/yj_yjcg/202010/P020201209462078667019.pdf.

³⁸ Ray Bowen: “Beijing’s Promotion of PRC Technical Standards,” Written Testimony for The United States-China Economic and Security Review Commission (USCC) of the United States Congress Hearing on “A ‘China Model?’ Beijing’s Promotion of Alternative Global Norms and Standards; Panel III: Technological Competition and Driving New Standards,” v2, March 6, 2020, posted on the official website of the USCC, observed Jun 30, 2026 at: https://www.uscc.gov/sites/default/files/testimonies/March%2013%20Hearing_Panel%203_Ray%20Bowen%20Pointe%20Bello.pdf.

³⁹ According to the “All about ISO” description on the organization’s official website, the Geneva, Switzerland-based International Organization for Standardization (ISO) is “an independent, non-governmental international organization with a membership of 164 national standards bodies,” observed 31 July 2019 at root URL: <https://www.iso.org/about-us.html>.

⁴⁰ According to the “About the IEC” page on the organization’s official website, the IEC (International Electrotechnical Commission)—founded in 1906—is the “world’s leading organization for the preparation and publication of International Standards for all electrical, electronic and related technologies. These are known collectively as “electrotechnology”. IEC provides a platform to companies, industries and governments for meeting, discussing and developing the International Standards they require. All IEC International Standards are fully consensus-based and represent the needs of key stakeholders of every nation participating in IEC work. Every member country, no matter how large or small, has one vote and a say in what goes into an IEC International Standard. The IEC is also the world’s leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies. Close to 20 000 experts from industry, commerce, government, test and research labs, academia and consumer groups participate in IEC Standardization work. . . . The IEC is one of three global sister organizations (IEC, ISO, ITU) that develop International Standards for the world. When appropriate, IEC cooperates with ISO (International Organization for Standardization) or ITU (International Telecommunication Union) to ensure that International Standards fit together seamlessly and complement each other. Joint committees ensure that International Standards combine all relevant knowledge of experts working in related areas.” Observed 31 July 2019 at root URL: <https://www.iec.ch/about/?ref=menu>.

⁴¹ According to the “About the ITU” page on the organization’s official website, the International Telecommunications Union (ITU) “. . . is the United Nations specialized agency for information and communication technologies – ICTs. Founded in 1865 to facilitate international connectivity in communications networks, we allocate global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide. Every time you make a phone call via the mobile, access the Internet or send an email, you are benefitting from the work of ITU. ITU is committed to connecting all the world’s people – wherever they live and whatever their means. Through our work, we protect and support everyone’s right to communicate,” observed 15 February 2020 at root URL: <https://www.itu.int/en/about/Pages/default.aspx>.

⁴² 中华人民共和国外交部 [PRC Ministry of Foreign Affairs]: “中国同国际海事组织关系 [China’s Relationship with the International Maritime Organization],” posted April 2026 on the 国家联合国[State relationship to the UN] webpage official website of the official PRC Ministry of Foreign Affairs website, observed May 21 2026 at: https://www.mfa.gov.cn/web/gjhdq_676201/gjhdqzz_681964/lhg_681966/zghgzz_681970/201505/t20150525_9380042.shtml.

⁴³ International Maritime Organization: “Council Members,” undated post on the official website of the International Maritime Organization, observed May 21 2026 at: <https://www.imo.org/en/ourwork/ero/pages/council-members.aspx>.

⁴⁴ 文/周佰铨 翟盘茂 [By Zhou Baiquan [中国气象科学研究院 副研究员,硕士生导师] and Zhai Panmao [中国气象科学研究院 研究员,博士生导师]]: “地球变暗了[Is the Earth Dimming?],” posted November 24, 2025 on the official website of Xinhua News Agency’s 《环球》杂志 [Global Magazine], observed May 27, 2026 at: <https://www.news.cn/globe/20251124/0009e75dd11f4b3e828b3ef6ce4acdff/c.html>.

of Stratospheric Geoengineering and Their Impacts on the Ecological Environment” project of the 2024 “earth systems and global change” key special program—was coauthored by two members of the Chinese Academy of Meteorological Sciences, one of whom Zhai Panmao is named as the “Project Tracking Expert” of the “Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment” project.⁴⁵

Sure enough, a “2026 International Conference on Solar Radiation Modification (SRM2026)” hosted by China Huaneng Group Co., Ltd.’s Xi’an Thermal Power Research Institute and the Xi’an University of Technology “aimed to establish a global collaborative platform integrating industry, academia, and research in the field of SRM technology” according to an article posted on the official website of the Xi’an University of Technology School of Materials Science and Engineering.⁴⁶ China Huaneng Group Co., Ltd. is a key central state-owned enterprise under the direct control of the PRC State Council’s State-owned Assets Supervision and Administration Commission.⁴⁷ Though nominally appearing to be oriented more toward albedo SRM technologies than SAI SRM technologies, the conference did not make that distinction when it announced that it has “launched an initiative to establish the International Alliance for Solar Radiation Modification (IASRM), designed to coordinate global research, standards, and industrial resources in the SRM sector,” while the Xi’an University of Technology announced “plans to collaborate with domestic and international

peers to establish a joint laboratory for novel radiation-regulating materials and participate in the discussion and formulation of international standards related to SRM.”

CLIMATE, GEOENGINEERING TERMS IN DOCUMENTS SIGNAL PRC PRIORITY TO PURSUE LEAD

The PRC terminology of technological development strategy applied recently to SRM, geoengineering, and weather modification reflects several of the key components of the framework articulated by Xi Jinping—General Secretary of the CCP—during his speech to the 19th Congress of the Communist Party in October 2017. In the speech, Xi enumerated seven strategies which evolved during four decades to become the nucleus of the Party’s economic development and political economy strategies during the present decade: (1) the strategy of rejuvenating the country through **science and education**, (2) the strategy of strengthening the country through talents [human capital], (3) the **innovation-driven development strategy**, (4) the **rural revitalization strategy**, the **coordinated regional development strategy**, (5) the **sustainable development strategy**, and the **military-civil fusion development strategy**.⁴⁸ Beijing also quietly elevated its “China Standard 2035” engineering and technical standards plans and programs to “**national standardization development strategy**” status, adding this eighth development strategy amid the COVID19 pandemic unfolding during early 2020.

The China Meteorological Administration’s

⁴⁵ 地球系统数值模拟与应用全国重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application]: “国家重点研发计划‘平流层地球工程的中国气候效应及对生态环境的影响’项目2025年度会议召开 [2025 Annual Meeting Held for the National Key R&D Program Project: ‘Climatic Effects of Stratospheric Geoengineering over China and Its Impacts on the Ecological Environment’],” posted December 30, 2025 on the 综合新闻 [General News] webpage of the official website of the 地球系统数值模拟与应用全国重点实验室 [State Key Laboratory of Earth System Numerical Modeling and Application], observed May 27, 2026 at: http://labesm.iap.ac.cn/zhxw/202512/t20251230_814213.html.

⁴⁶ 西安理工大学材料科学与工程学院 [Xi’an University of Technology School of Materials Science and Engineering]: “[淬砺成材] 聚焦太阳辐射调控前沿·西安理工大学多项成果亮相 2026 年国际太阳辐射干预大会 [[Forging Excellence] Focusing on the Frontier of Solar Radiation Modification: Xi’an University of Technology Showcases Multiple Achievements at the 2026 International Conference on Solar Radiation Intervention],” posted July 16, 2026 on the official website of the 西安理工大学材料科学与工程学院 [Xi’an University of Technology School of Materials Science and Engineering], and observed July 23, 2026 at: <https://clxy.xaut.edu.cn/info/1092/4907.htm>.

⁴⁷ 中国华能集团有限公司 [China Huaneng Group Co., Ltd.]: “我们的企业 [[About] Our Company],” undated webpage on the official website of 中国华能集团有限公司 [China Huaneng Group Co., Ltd.], observed July 28, 2026 at <https://www.chng.com.cn/us-ent.html>

⁴⁸ 习近平 [Xi Jinping]: “习近平：决胜全面建成小康社会 夺取新时代中国特色社会主义伟大胜利——在中国共产党第十九次全国代表大会上的报告 (2017年10月18日) [Xi Jinping: Decisive Victory to Build a Moderately Prosperous Society in an All-round Way to Win the Great Victory of Socialism with Chinese Characteristics in the New Era—Report at the 19th National Congress of the Communist Party of China (18 October 2017)],” posted 27 October 2017 by Xinhuanet [新华网], observed July 15, 2026 at: http://www.xinhuanet.com/politics/19cpcnc/2017-10/27/c_1121867529.htm

Weather Modification Center—which is “primarily responsible for formulating **technical standards and specifications** [emphasis added] related to weather modification”—“aims to strengthen scientific and technological support and operational guidance for weather modification nationwide, build a global hub for **talent and innovation** [emphasis added] in this field, enhance the global competitiveness and international standing of the PRC’s meteorological science and technology,” according to a 2021 article about the Center’s launch in official PRC media.⁴⁹ Weather modification work should implement “major national strategies, . . . position **innovation** [emphasis added] as the primary driving force for development, . . . and **innovate talent** [emphasis added] cultivation mechanisms,” according to a 2020 State Council Opinion on development of weather modification.⁵⁰

The same 2020 State Council Opinion on development of weather modification calls for steward agencies to “improve the technological **innovation** [emphasis added] system for weather modification,” “. . . strive to achieve breakthroughs in **key technologies** [emphasis added], . . . strengthen international exchanges and enhance the level of open cooperation in technological **innovation** [emphasis added].” Steward agencies should “establish national-level scientific experiment bases and key laboratories for weather modification . . . and . . . elevate **technological standards** [emphasis added] and the effectiveness of scientific and technological achievements, . . .” according to the same 2020 State Council Opinion.

Assessments of the general efficacy of PRC deployment of these strategies in gaining and developing technologies—as well as gaining influence over or shaping international

governance—differ among observers and stakeholders. These strategies involve foreign (nonPRC) government agencies and corporate actors which may prefer not to publicize relevant metrics for various reasons. That said, a substantial body of both PRC and foreign qualitative reporting as well as difficult-to-overlook long-term trends suggests that the PRC’s technology acquisition strategy has been highly—and likely increasingly—effective during recent decades. Through programs of proactive subsidization and other support, the PRC has proven highly adept at harnessing the technical talents—human capital—developed by PRC individual scientists and professionals abroad by offering incentive programs under its **science and education**, and **talents** strategies. It has also proven very effective not only at “indigenizing” foreign innovation back into the PRC, but also at harnessing—some might say co-opting—multilateral organizations to serve PRC development goals. The PRC’s objectives include influence over functional organizations of the United Nations, and professional NGOs such as the international technical standards organizations and their committees, though these are by no means the only types of organizations targeted.

Language in planning documents, organization meeting reports and other evidence indicate that—as with other “key core technologies,” which the CCP deems vital to acquire and control as a matter of national security and economic development⁵¹—in the field of stratospheric geoengineering the PRC has aggressively and increasingly deployed a raft of “talents program” policies to acquire science and technology through access to human capital—talent—from abroad. “Talents program” policies encompass repatriation of PRC-origin students it had sent abroad over the past

⁴⁹ 中华新闻网[China News Network]: “中国气象局人工影响天气中心正式启动 [The China Meteorological Administration’s Weather Modification Center has officially launched],” posted December 22, 2021 on the official website of the 中华新闻网[China News Network], observed June 7, 2026 at: <https://www.chinanews.org/zx/dalu/17734.html>

⁵⁰ 国务院办公厅 [State Council General Office]: “国务院办公厅关于推进人工影响天气工作高质量发展的意见 [State Council General Office Opinion on Promoting High-Quality Development of Weather Modification Work],” posted December 2, 2020 on the PRC official government website Gov.cn, and rehosted by the 中华人民共和国生态环境部 [PRC Ministry of Ecology and Environment], observed June 2, 2026 at: https://www.mee.gov.cn/zcwj/gwywj/202012/t20201207_811723.shtml and https://english.www.gov.cn/policies/latestreleases/202012/02/content_WS5fc76218c6d0f7257694125e.html.

⁵¹ 国防科技大学党的创新理论研究中心 [Research Center for the Party’s Innovative Theories, National University of Defense Technology]: “努力把关键核心技术掌握在自己手中 [Strive to keep key core technologies firmly in our own hands],” Rehosted by 求是网 [QSTHEORY.CN] from 2023 Issue 10 of : 《红旗文稿》 [《Red Flag Manuscripts》], and observed at: https://www.qstheory.cn/dukan/hqwg/2023-05/26/c_1129646716.htm.

nearly five decades, “scientific exchanges” with nonPRC or expatriate professionals, or through central state and provincial establishment of an extensive network of state-funded science and technology or innovation or entrepreneurship parks or university departments, or government research institutes where PRC-origin or foreign professionals are incentivized to bring their basic science and engineering knowledge and expertise acquired abroad to teach, develop, disseminate, commodify, and integrate into PRC sectors and supply chains.

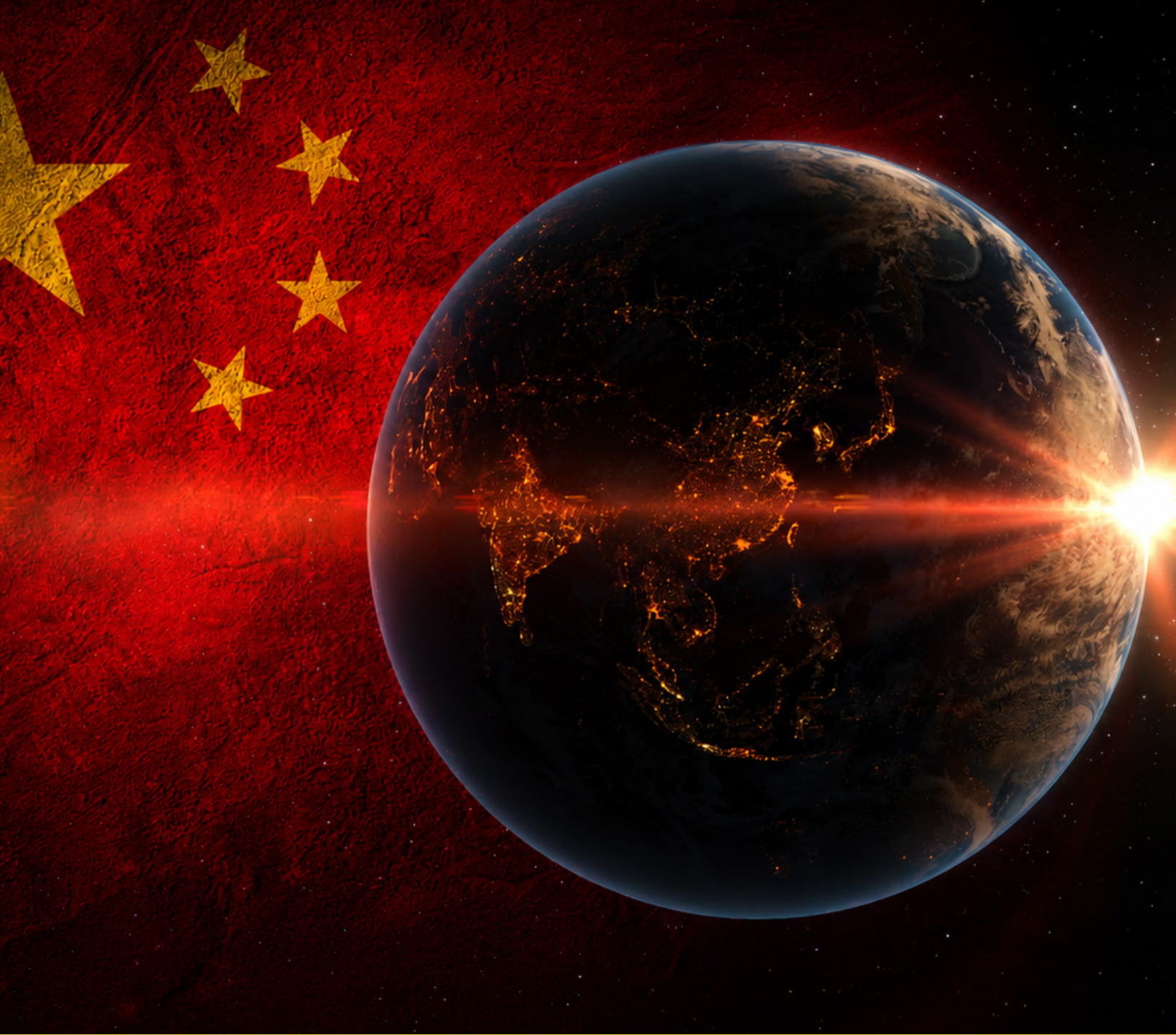
NonPRC stakeholders hoping to play leading roles in the future of key climate technologies such as SRM should take note of the PRC’s increased resourcing of “earth system and global change” research and scientific personnel, and specifically SRM research, as well as consider increasing their own and their allies’ focus and engagement to address the current dearth of meaningful and effective global standards, regulation, and governance of the realm.

Beijing intended its 2018 institutional reform of Jinan University—in part—to delegate the university a lead role in advancing the CCP goals of tapping international scientific research and acquiring scientific talent according to a report in CCP Shanghai Municipal Party Committee-controlled media.⁵² Similarly, the NUIST expects the “State Key Laboratory of Climate System Prediction and Risk Management (CPRM)” set up at NUIST in 2024 to help NUIST “build a high-level hub for talent cultivation; and serve major national strategies by creating a world-class center for international scientific cooperation and exchange,” according to reporting by NUIST.⁵³ More than 90% of the CPRM’s 150 permanent staff members “possess overseas research experience,” and the staff includes “28 distinguished national-level talents” and “30 outstanding young national-level talents” who are awarded national talents programs funding, according to the “Laboratory Overview” posted on the lab’s webpage at NUIST’s website.⁵⁴

⁵² 澎湃新闻记者 钟煜豪 [ThePaper reporter Zhong Yuhao]: “国家机构改革后，暨南大学归属中央统战部、国务院侨办领导 [Following the reform of state institutions, Jinan University was placed under the leadership of the United Front Work Department of the CPC Central Committee and the Overseas Chinese Affairs Office of the State Council.],” posted June 29, 2018 by 澎湃新闻 [ThePaper]---which is controlled by the Communist Party of China Shanghai Municipal Party Committee-controlled (via the 上海报业集团 [Shanghai United Media Group])---and observed June 25, 2026 at: https://m.thepaper.cn/newsDetail_forward_2226510?spm=smcpc.content.content.11546128000117ZF7ZGW1.

⁵³ 南京信息工程大学 [Nanjing University of Information Science and Technology]: “中国大气科学领域国家级重点实验室建设推进会暨第一届学术委员会第一次会议召开 [Meeting on Advancing the Construction of National Key Laboratories in China’s Atmospheric Science Sector and the First Meeting of the First Academic Committee Convened],” posted on the 国际新闻网 [The Skyline] news webpage on the official website of the 南京信息工程大学 [Nanjing University of Information Science and Technology], rehosted by 百度 [Baidu] as a screenshot, observed June 30, 2026 archived at: https://baike.baidu.com/reference/65518530/533aYdO6cr3_z3kATKCOxfSkY3zHM4ykvOLRU7tzzqIPmGapB5ngWJt87sl27eM-pEQ_e_ptsL-kGx7_JCETH6-gQcu83XeYjnHX8AjHKzb_j_sZxy4YRvcoAGA.

⁵⁴ 气候系统预测与变化应对国家重点实验室 [State Key Laboratory of Climate System Prediction and Response to Climate Change [“State Key Laboratory of Climate System Prediction and Risk Management” (CPRM)]]: “实验室简介 [Laboratory Overview],” undated webpage on the Laboratory’s webpages on the official website of 南京信息工程大学 [Nanjing University of Information Science and Technology], observed July 15, 2026 at: <https://cprm.nuist.edu.cn/sysgk/sysjj.htm>.



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