Da Zhang
Curriculum Vitae

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Current Position and Affiliations

Associate Professor (with tenure), Institute of Energy, Environment, and Economy, Tsinghua University
Coordinating Lead Author, IPCC AR7
Associate Editor, Journal of Global Economic Analysis
Associate Deputy Editor, Climatic Change
Editor, Springer Nature Humanities & Social Sciences

Academic and Professional Experience

Associate Professor, Institute of Energy, Environment, and Economy, Tsinghua University, 06/2020 – 12/2024
Assistant Professor, Institute of Energy, Environment, and Economy, Tsinghua University, 12/2018 – 06/2020
Research Scientist, Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, 07/2017 – 11/2018
Postdoctoral Associate, Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, 06/2014 – 06/2017

Education

Ph.D., Institute of Energy, Environment and Economy, Tsinghua University, China, 06/2014.
B.S., Industrial Engineering, Tsinghua University, China, 06/2009.

Publications

Selected Publications (in English)

[#] equal contribution; [*] corresponding author(s)

Goulder, Lawrence[#], Xianling Long[#], Chenfei Qu[#], and Da Zhang[#]. China's Nationwide CO_2 Emissions Trading System: A General Equilibrium Assessment. *American Economic Journal: Economic Policy*, in press.

Tian, Ruijie, Huajin Wang, Da Zhang[*], Xiliang Zhang, Thomas Sterner. Heterogeneous Responses to

Carbon Pricing: Firm-Level Evidence from Beijing Emissions Trading Scheme. *Journal of Environmental Economics and Management* (2026), 136, 103266.

Zhu, Ziheng[#*], Hanjie Mao[#], Shuo Zhang, Xiaogang He, Da Zhang. Spatially resolved modeling of pumped storage and hydropower for China's carbon neutrality. *Energy & Environmental Science*, in press.

Zhang, Zhenhua, Ziheng Zhu, Xi Lu, Da Zhang[*], Michael R. Davidson[*]. Ratcheting up wind and solar targets for decarbonizing the power sector in China and beyond. *Cell Reports Sustainability* (2025), 2 (7), 100389.

Zhong, Junting, Xiaoye Zhang, Da Zhang, Deying Wang, Lifeng Guo, Hantang Peng, Xiaodan Huang, Zhili Wang, Yadong Lei, Yixiong Lu, Chenfei Qu, Xiliang Zhang, Changhong Miao. Plausible global emissions scenario for 2° C aligned with China's net-zero pathway. *Nature Communications*, 16 (1): 8102.

Zhang, Da, Valerie J. Karplus[*]. Management practices and manufacturing firm responses to a randomized energy audit. *Nature Energy* (2025).

Zhu, Ziheng, Da Zhang[*], Xiaoye Zhang[*], and Xiliang Zhang[*], Integrated Modeling the Transition Pathway of China's Power System. *Energy & Environmental Science* (2025).

Long, Xianling, Nicolas Astier, Da Zhang. Is broader trading welfare improving for emission trading systems? *Journal of Environmental Economics and Management* (2025), 130: 103110.

Zhang, Da, Ziheng Zhu, Shi Chen, Chongyu Zhang, Xi Lu[*], Xiliang Zhang, Xiaoye Zhang, and Michael R. Davidson[*]. Spatially Resolved Land and Grid Model for Carbon Neutrality in China. *Proceedings of the National Academy of Sciences of the United States of America* (2024), 121(10): e2306517121.

Zhang, Da[#], Xiaodan Huang[#], Junting Zhong, Lifeng Guo, Siyue Guo, Deying Wang, Changhong Miao, Xiliang Zhang[*], Xiaoye Zhang[*]. A representative CO_2 emissions pathway for China toward carbon neutrality under the Paris Agreement's 2 ºC target. *Advances in Climate Change Research* (2023), 14(6): 941–951.

Zhang, Da[*], Qingyi Wang, Shaojie Song, Simiao Chen, Mingwei Li, Lu Shen, Siqi Zheng, Bofeng Cai[*], Shenhao Wang, Haotian Zheng[*]. Machine learning approaches reveal highly heterogeneous air quality co-benefits of the energy transition. *iScience* (2023), 26(9): 106647.

Zhang, Da, Hantang Peng, Lin Zhang[*]. Share of polluting input as a sufficient statistic for burden sharing. *Energy Economics* (2023), 121: 106647.

Zhao, Mengzhen[#], Xiaodan Huang[#], Tord Kjellstrom, Jason Kai Wei Lee, Matthias Otto, Xiliang Zhang, Marina Romanello, Da Zhang[*], Wenjia Cai[*]. Labour productivity and economic impacts of carbon mitigation: A modelling study and benefit-cost analysis. *The Lancet Planetary Health* (2022), 6(12): e941–e948.

Li, Chenxing[#], Yang Yu[#], Andrew Chi-Chih Yao[*], Da Zhang[*], Xiliang Zhang[*]. An authenticated and secure accounting system for international emissions trading. *Climate Policy* (2022), 22 (9-10): 1333–1342.

Qin, Shize[#], Sheng Nie[#], Yusheng Guan, Da Zhang[*], Cheng Wang[*], Xiliang Zhang. Forest emissions reduction assessment using airborne LiDAR for biomass estimation. *Resources, Conservation & Recycling* (2022), 181: 106224.

Zhao, Bin[#], Jing Zhao[#], Hao Zha, Ruolan Hu, Yalu Liu, Chengrui Liang, Hongrong Shi, Simiao Chen, Yue Guo, Da Zhang,[*] Kristin Aunan, Shaojun Zhang, Xiliang Zhang, Lan Xue, and Shuxiao Wang[*]. Health Benefits and Costs of Clean Heating Renovation: An Integrated Assessment in a Major Chinese

City. *Environmental Science and Technology* (2021), 55, 14: 10046–10055.

He, Guannan, Jeremy Michalek, Qixin Chen, Soummya Kar, Da Zhang*, Jay Whitacre*. Utility-scale portable energy storage systems. *Joule* (2021), 5(2): 379–392.

Zhang, Da*, Jun Gao, Ding Tang, Xiaomeng Wu, Junye Shi, Jiangping Chen, Yinghong Peng, Shaojun Zhang*, Ye Wu. Switching on auxiliary devices in vehicular fuel efficiency tests can help cut CO_2 emissions by millions of tons. *One Earth* (2021), 4: 135–145.

Karplus, Valerie J., Thomas Geissmann, Da Zhang. Institutional complexity, management practices, and firm productivity. *World Development* (2021), 142: 105386.

Qu, Chenfei, Xi Yang, Da Zhang*, Xiliang Zhang*. Estimating health co-benefits of climate policies in China: An application of the regional emissions-air quality-climate-health (REACH) framework. *Climate Change Economics* (2020), 11(3): 2041004.

Zhang, Xiliang*, Andreas Löschel*, Joanna Lewis*, Da Zhang*, Jinyue Yan*. Emissions trading systems for global low carbon energy and economic transformation. *Applied Energy* (2020), 279: 115858.

Guo, Hongye, Michael R. Davidson, Qixin Chen*, Da Zhang*, Nan Jiang, Qing Xia, Chongqing Kang, Xiliang Zhang. Power Market Reform in China: Motivations, Progress, and Recommendations. *Energy Policy* (2020), 145: 111717.

Karplus, Valerie J., Xingyao Shen, Da Zhang*. Herding cats: Firm non-compliance in China's industrial energy efficiency program. *The Energy Journal* (2020), 41(4): 3531.

Filippini, Massimo, Thomas Geissmann, Valerie J. Karplus, Da Zhang. The productivity impacts of energy efficiency programs in developing countries: Evidence from iron and steel firms in China. *China Economic Review* (2020), 59: 101364.

Zhang, Da, Qin Zhang, Shaozhou Qi, Jinpeng Huang, Valerie J. Karplus*, Xiliang Zhang*. Integrity of firms' emissions reporting in China's early carbon markets. *Nature Climate Change* (2019), 9: 164–169.

Zhang, Da*, Justin Caron, Niven Winchester. Sectoral aggregation bias in the accounting of emissions embodied in trade and consumption. *Journal of Industrial Ecology* (2019), 23(2): 402–411.

Rausch, Sebastian, Da Zhang*. Capturing natural resource heterogeneity in top-down energy-economic equilibrium models. *Energy Economics* (2018), 74: 917–926.

Li, Mingwei#, Da Zhang# (co-first author), Chiao-Ting Li, Kathleen M. Mulvaney, Noelle E. Selin, Valerie J. Karplus. Air quality co-benefits of carbon pricing in China. *Nature Climate Change* (2018), 8: 398–403.

Davidson, Michael R. #, Da Zhang# (co-first author), Weiming Xiong, Xiliang Zhang*, Valerie J. Karplus*. Modelling the potential for wind energy integration on China's coal-heavy electricity grid. *Nature Energy* (2016), 1: 16086 (Nature Energy Editors' picks from 2016).

Zhang, Da, Marco Springmann, Valerie J. Karplus. Equity and emissions trading in China. *Climatic Change* (2016), 134: 131–146.

Karplus, Valerie J., Sebastian Rausch, Da Zhang*. Energy caps: Alternative climate policy instruments for China? *Energy Economics* (2016), 56: 422–431.

Springmann, Marco, Da Zhang, Valerie J. Karplus. Consumption-Based Adjustment of China's Emissions-Intensity Targets: An Analysis of its Potential Economic Effects. *Environmental and Resource Economics* (2015), 61: 615–640.

Zhang, Da, Valerie J. Karplus, Cyril Cassisa, Xiliang Zhang. Emissions Trading in China: Progress and Prospects. *Energy Policy* (2014), 75: 9–16.

Zhang, Da, Sebastian Rausch, Valerie J. Karplus, Xiliang Zhang. Quantifying regional economic

impacts of CO_2 intensity targets in China. *Energy Economics* (2013), 40: 687-701.

Other Peer-reviewed Publications

Peng, Hantang, Chenfei Qu, Valerie J. Karplus, Da Zhang*. The C-REM 4.0 model: A CGE model for provincial analysis of China's carbon neutrality target. Energy and Climate Management, 2024, 1(1): 55–69.

Liang, Heng, Hongyu Zhang, Xiliang Zhang, Junling Huang, Da Zhang*. Role of demand response in the decarbonisation of China's power system. *Environmental Impact Assessment Review* (2024), 104, 107313.

Zhang, Hongyu, Da Zhang*, Siyue Guo*, Xiliang Zhang. Impact of benchmark tightening design under output-based ETS on China's power sector. *Energy* (2024), 288, 129832.

Yu, Runxin, Da Zhang*, Xiliang Zhang, Xiaodan Huang. Machine learning for data verification in emissions trading system. *Resources, Conservation & Recycling* (2023), 199, 107239.

Zhang, Hongyu, Da Zhang*, Xiliang Zhang. The role of output-based emission trading system in the decarbonization of China's power sector. *Renewable and Sustainable Energy Reviews* (2023), 173 113080.

Wang, Xinhao, Lulin Xu, Qin Zhang, Da Zhang*, Xiliang Zhang. Evaluating the data quality of continuous emissions monitoring systems in China. *Journal of Environmental Management* (2022), 314, 115081.

Davidson, Michael#, Valerie J. Karplus#, Da Zhang#, Xiliang Zhang#. Policies and institutions to support carbon neutrality in China by 2060. *Economics of Energy & Environmental Policy* (2021), 10(2): 7–24.

Siyue Guo, Yu Liu, Weichen Zhao, Jiaquan Li, Guangwen Hu, Hui Kong, Yifan Gu, Bang Xu, Xiaodan Huang, Yan Zheng, Shihan Zhang, Da Zhang, Lancui Liu, Xueting Peng, Yi-Ming Wei*, Xiliang Zhang*, Zuoren Nie*. Technological development pathway for carbon neutrality in China. *Science Bulletin*, 2023, 68(02),117-120.

Mulvaney, Kathleen M., Noelle E. Selin, Amanda Giang, Marilena Muntean, Chiao-Ting Li, Da Zhang, Hélène Angot, Colin P. Thackray, Valerie J. Karplus. Mercury benefits of climate policy in China: Addressing the Paris Agreement and the Minamata Convention simultaneously. *Environmental Science and Technology* (2020), 54, 3: 1326-1335.

Cai, Bofeng, Can Cui, Da Zhang, Libin Cao, Pengcheng Wu, Lingyun Pang, Jihong Zhang, Chunyan Dai. China city-level greenhouse gas emissions inventory in 2015 and uncertainty analysis. *Applied Energy* (2019), 253: 113579.

Li, Mingwei, Da Zhang, Chiao-Ting Li, N. E. Selin, Valerie Karplus. Co-benefits of China's climate policy for air quality and human health in China and transboundary regions in 2030. *Environmental Research Letters* (2019), 14: 084006.

Yang, Yuanzhe, Hongyu Zhang, Weiming Xiong, Da Zhang*, Xiliang Zhang*. Regional power system modeling for evaluating renewable energy development and CO_2 emissions reduction in China. *Environmental Impact Assessment Review* (2018), 73: 142-151.

Kwon, Sae Yun, Noelle E. Selin, Amanda Giang, Valerie J. Karplus, and D. Zhang. Present and future mercury concentrations in Chinese rice: Insights from modeling. *Global Biogeochemical Cycles* (2018), 32(3): 437-462.

Weng, Yuyan, Da Zhang*, Lanlan Lu, Xiliang Zhang*. A general equilibrium analysis of floor prices for China's national carbon emissions trading system. *Climate Policy* (2018), 18(S1): 60-70.

Zhang, Xu, Xunmin Ou, Xi Yang, Tianyu Qi, Kyung-Min Nam, Da Zhang, Xiliang Zhang. Socioeconomic burden of air pollution in China: Province-level analysis based on energy economic model. *Energy Economics* (2017), 68: 478-489.

Zhang, Xiliang, Valerie J. Karplus, Tianyu Qi, Da Zhang, Jiankun He. Carbon emissions in China: How far can new efforts bend the curve? *Energy Economics* (2016), 54: 388–395.

Luo, Xiaohu, Justin Caron, Valerie J. Karplus, Da Zhang, Xiliang Zhang. Interprovincial Migration and the Stringency of Energy Policy in China. *Energy Economics* (2016), 58: 164-173.

Qi, Tianyu, Niven Winchester, Valerie J. Karplus, Da Zhang, Xiliang Zhang. An analysis of China's climate policy using the China-in-Global Energy Model. *Economic Modelling* (2016), 52, Part B: 650–660.

Zhu, Zhao, Da Zhang*, Peggy Mischke, Xiliang Zhang. Electricity generation costs of concentrated solar power technologies in China based on operational plants. *Energy* (2015), 89: 65–74.

Zhang, Da, Weiming Xiong, Chun Tang, Zhen Liu, Xiliang Zhang. Determining the appropriate amount of subsidies in wind power: The Integrated Renewable Power Planning (IRPP) model and its application in China. *Sustainable Energy Technologies and Assessments* (2014), 6: 141-148.

Kishimoto, Paul, Da Zhang, Valerie J. Karplus. Modeling regional transportation demand in China and the impacts of a national carbon constraint. *Journal of the Transportation Research Board* (2014).

Zhang, Da, Qimin Chai, Xiliang Zhang, Jiankun He, Li Yue, Xiufen Dong, Shu Wu. Economical assessment of large-scale photovoltaic power development in China. *Energy* (2012), 40: 370-375.

Zhang, Da, Songlin Tang, Bao Lin, Zhen Liu, Xiliang Zhang. Co-benefit of polycrystalline large-scale photovoltaic power in China. *Energy* (2012), 41: 436-442.

He, Jiankun, Zhiwei Yu, Da Zhang. China's strategy for energy development and climate change mitigation. *Energy Policy* (2012), 53: 7–13.

Zhang, Da, Xiliang Zhang, Jiankun He, Qimin Chai. Offshore wind energy development in China: Current status and future perspective. *Renewable and Sustainable Energy Reviews* (2011), 15: 4673–4684.

Grants

Co-PI, "Tsinghua-Tencent CCUS MRV Research Program", University-level Research Program (RMB 18,000,000), 06/2024-06/2027.

Co-PI, "Tsinghua-China Forestry Group Forestry Carbon Sink Research Program", University-level Research Program (RMB 6,000,000), 08/2022-06/2024.

Co-PI, "Tsinghua-Three Gorges Climate Governance and Green Transition Research Program" , University-level Research Program (RMB 30,000,000), 08/2021-08/2026.

PI, "Spatially Resolved Land and Grid Model for Carbon Neutrality", the National Science Foundation of China (RMB 3,000,000), 01/2023-12/2025.

PI, "Overseas High - level Talent Program Youth Project" (RMB 2,000,000), 01/2021-12/2023.

Co-PI, "Research on Optimizing the Funding Mechanism of Youth Science Foundation Projects", the National Science Foundation of China (RMB 330,000), 09/2024 - 12/2025.

PI, "System Mapping for Power Sector Reform in China", University College London (GBP 70,000), 12/2024 - 07/2025.

PI, "Research on Recycling and Reuse of New Energy Power Generation Equipment", China Renewable Energy Engineering Institute (RMB 828,000), 11/2024 - 06/2025.

PI, “Research on the Development Trend of Carbon Electricity Market Reform and Group Participation Strategy”, China Guangdong Nuclear Power Co.,Ltd. (RMB 798,000), 11/2024 - 06/2025.
PI, “Legislation to support future renewable energy development in China and broader carbon reduction research”, Environmental Defense Fund (RMB 450,000), 10/2024 - 12/2025.
PI, “Theoretical underpinnings, policy frameworks, and practical applications of renewable energy market mechanisms”, Tsinghua University Research Institute (RMB 200,000), 09/2024 -09/2025.
PI, “Research on the Assessment and New Type of Power System Modeling of Renewable Energy(Phase III)”,Tsinghua University Research Institute (RMB 150,000), 05/2024 - 04/2025.
PI, “Research on Paid Allocation in the National Carbon Emission Trading Market”, Ministry of Ecology and Environment and Tsinghua University’ s National Governance and Global Governance Research Institute (RMB 100,000), 04/2024 - 12/2024.
PI, “Expanding Renewable and Clean Electricity for Global Corporate Supply Chains”, Carnegie Mellon University (USD 75,000), 03/2024 - 10/2024.
PI, “Market and policy mechanisms for decarbonizing the power sector in the EU and China”, Sino-German Center of the National Natural Science Foundation of China (RMB 629,600), 11/2022 - 10/2025.
PI, “Continuous Emissions Monitoring in China’s Carbon Market: A Case Study of the Power Sector”, Environmental Defense Fund (RMB 490,000), 10/2023 - 12/2024.
PI, “Research on the Mechanism of Coordinated Support for the Development of Renewable Energy by Green Electricity, Green Certificates, and Carbon Markets”, Tsinghua University Research Institute (RMB 300,000), 09/2023 - 09/2024.
PI, “Research on the Path of Green Electricity and Green Certificate Trading and Carbon Asset Trading for New Energy Flat-rate Projects to Increase Income and Efficiency”, Guohua Energy Co., Ltd. (RMB 420,000), 09/2023 - 06/2024.
PI, “Research on the Assessment and New Type of Power System Modeling of Renewable Energy”, Tsinghua University Research Institute (RMB 128,000), 10/2023 - 03/2024.
PI, “Research on the Assessment of Green Energy Development and Transformation in Urban Parks”, China Renewable Energy Engineering Institute (RMB 470,000), 10/2023 - 12/2023.
PI, “The optimization and supporting mechanism of coordinated development of wind and solar power in China”, the National Science Foundation of China (RMB 495,000), 01/2020-12/2023.
PI, “Regional analysis of China’s carbon pricing policy implications on energy and CO_2 emissions”, the International Energy Agency (EUR 131,200), 07/2019-06/2023.
PI, “The role of grid companies in carbon emissions accounting and finance”, Southern Grid (RMB 1,775,000), 02/2022-12/2022.
PI, “Monitoring and diagnosis of urban carbon emissions using power data”, State Grid (RMB 1,600,000), 05/2022-12/2023.
PI, “Green power exchange and power-carbon market coordination for Xiong’an District”, State Grid (RMB 930,000), 05/2022-12/2022.
PI, “Key technologies for power-carbon nexus and green power certification”, State Grid (RMB 800,000), 05/2022-12/2023.
PI, “Integrated economic and social benefit evaluation of energy revolution led by renewable energy in China”, the National Energy Administration/ World Bank China Renewable Energy Scale-up Program (CRESP) (RMB 1,500,000), 10/2019-10/2020.
PI, “Impacts of carbon peaking on economy restructuring”, the National Development and Reform

Commission (RMB 100,000), 09/2021-06/2022.
PI, "The embodied domestic demand for oil to support energy security", the National Development and Reform Commission (RMB 100,000), 04/2020-12/2020.
PI, "Energy consumption forecast and control targets in the 14th Five-Year Plan period", the National Development and Reform Commission (RMB 100,000), 10/2019-04/2020.
PI, "Financing a new power system with high-share renewable penetration", the Ministry of Finance (RMB 220,000), 05/2021-12/2021.
PI, "Economic analyses on the heating renovation campaign", the Ministry of Ecology and Environment (RMB 100,000), 05/2021-12/2021.
PI, "Introducing auctioning in China's national emissions trading scheme", the Environmental Defense Fund (RMB 495,000), 10/2021-10/2022.
PI, "Data quality analysis and warning systems for the ETS firms", the Environmental Defense Fund (RMB 495,000), 10/2020-10/2021.
PI, "The application of big data in enterprise continuous online monitoring system to environmental governance practice: Statistical analysis and field trials", Tsinghua-INDITEX Sustainable Development Fund (RMB 300,000), 01/2020-12/2021.
PI, "Research and application demonstration of big data system for energy environment of new energy vehicles", Tsinghua University - Toyota Joint Research Institute (RMB 300,000), 01/2020-12/2021.

Conferences

The Hong Kong Climate Forum 2025, Hong Kong, China, March 24-25, 2025.
Forum on Carbon Neutrality and Energy System Transformation, Cambridge, USA, February 11-16, 2025.
The Scoping Meeting for the IPCC Seventh Assessment Report (AR7), Kuala Lumpur, Malaysia, December 9-13, 2024.
Workshop on Open Modeling Carbon Neutrality of the Power Sector, Berkeley, USA, July 16-25, 2024.
The 29th Annual Conference of the European Association of Environmental and Resource Economists, Leuven, Belgium, July 1-4, 2024.
The 27th Annual Conference on Global Economic Analysis, Fort Collins, USA, June 5-7, 2024.
The Second JEEM Conference in Environmental and Resource Economics, Hong Kong, China, December 9-10, 2023.
Research Workshop on Accelerating Green Steel, Pittsburgh, USA, September 30 to October 6, 2023.
The 26th Annual Conference on Global Economic Analysis, Bordeaux, France, June 14-16, 2023.
The 6th International Conference of China and Development Studies, Shanghai, China, June 10-11, 2023.
AERE 2023 Summer Conference, Portland, USA, May 31 to June 2, 2023.
Workshop on Climate, the Environment and U.S.-China Relations, Oslo, Norway, May 7-9, 2023.
NBER Environment and Energy Economics Program Meeting, Spring 2023, Cambridge, USA, March 30-31, 2023.
The EU China Climate Expert Dialogue, online, October 20, 2022.
Australia-China Decarbonisation Roundtable, online, March 16, 2022.
The 5th China International Academic Conference on Development, online, June 11-12, 2022.

Workshop on Carbon Pricing Designs for the Power Sector in Selected Countries, online, December 16, 2021.
2021 INFORMS Annual Meeting, online, October 24-27, 2021.
US-China Climate Study Group, online, December 2, 2020.
IAEE webinar, online, September 23, 2020.
AERE 2020 Virtual Conference, online, June 3-5, 2020.
Asia-Pacific Climate Week (APCW), Bangkok, Thailand, September 2-6, 2019.
China-Australia Forum on New Energy Opportunities, Beijing, China, May 9, 2019.