

Chenfei QU

Institute of Energy, Environment and Economy,
Tsinghua University
Expect to graduate in June, 2025

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Education

Tsinghua University, Institute of Energy, Environment and Economy	2020.9 – Present
• Ph.D. in Energy and Climate Change Economics	
Tsinghua University, School of Environment	2016.9 – 2020.8
• B.S. in Environmental Engineering	
Tsinghua University, School of Economics and Management	2017.9 – 2020.8
• Minor in Economics	
Venice International University, Globalisation Program	2019.2 – 2019.6

Research Interests

Topics: Climate Change, Energy and Climate Policies, Emissions Trading, Renewable Energy, Air Pollution

Methodologies: General Equilibrium Models, Integrated Assessment Models, Theoretical Models, Meta-Analysis, Econometric Analysis

Professional Experience

Visiting Researcher, ZEW-Leibniz Centre for European Economic Research	2024.9 – Present
Mentor: Sebastian Rausch	
• Currently working on research investigating the optimal supporting mechanism for negative emissions technology.	
Research Assistant, World Bank DEC-Sustainability & Infrastructure	2022.6 – 2023.9
Mentor: Carolyn Fischer	
• Conducted research on the overlapping policies of China's carbon market and renewable policies	
Research Assistant, Kyoto University, Fujimori's Lab	2019.7 – 2019.9
Mentor: Shinichiro Fujimori	
• Conducted research on China's electricity load curves and the electricity market reform.	
• Formulated a report and a database on China's fossil-based power plants.	
Research Assistant, National Development and Reform Commission	2018.6 – 2019.12
Mentor: Kejun Jiang	
• Led research on Pakistan's energy transition strategy using the Low Emissions Analysis Platform (LEAP). Analyzed energy transition for Pakistan's energy, industry, transportation, and building sectors. Independently wrote a comprehensive report on the findings.	

- Conducted two workshops in Pakistan as the lead trainer, delivering hands-on instruction on the LEAP model application to participants.

Working Papers

China's Nationwide CO₂ Emissions Trading System: A General Equilibrium Assessment (with Lawrence H. Goulder, Xianling Long, Da Zhang) NBER Working Paper Series 31809:
<http://www.nber.org/papers/w31809>

- China's CO₂ emissions trading system was launched in 2021. The system is a rate-based system, differing from a cap and trade. We developed a dynamic general equilibrium model that uniquely accounts for the special incentives created by this system. Our model also adopted a novel approach that accounts for technological heterogeneity within electricity and industrial sectors and considers China's institutional and fiscal characteristics that influence policy costs and distributional impacts. We found that the system's environmental benefits exceed its costs by a factor of five or more. Interactions with the fiscal system reduce or eliminate the system's cost disadvantage relative to C&T.

Rate-Based Emissions Trading with Overlapping Policies: Insights from Theory and an Application to China (with Carolyn Fischer, Lawrence H. Goulder)

<https://www.nber.org/papers/w33197>

- Jurisdictions employing emissions trading systems (ETS) often use additional policies like support for renewables, leading to complex interactions. While cap-and-trade systems have been widely studied, rate-based ETS, with flexible emissions and prices, demands further investigation. This paper provides a formal theoretical analysis and a numerical general equilibrium model to examine how various ETS interact with policies like renewable subsidies and electricity taxes. In China's case, we found that overlapping renewable policies can reduce abatement costs by 20-30%. Further optimization of these policies can lead to additional cost reductions, highlighting the importance of harmonizing policies.
- This paper won the **Best Conference Paper Golden Prize** (one out of 96) in the 2024 Conference of the Chinese Association of Environment and Resource Economists (CAERE).

Different Carbon Neutrality Strategies Reveal Divergent Aggregate Health Impacts and Distributional Consequences in China. Da Gao* and Chenfei Qu*, Bin Zhao, Shuxiao Wang, Xiaodan Huang, Yisheng Sun, Yueqi Jiang, Zhongfeng Xu, Xiaocong Wang, Yicong He, Jiewen Shen, Dejie Yin, Haotian Zheng, Hongrong Shi, Zhe Jiang, Xiaowen Zeng, Yun Zhu, Xiliang Zhang, Da Zhang (* contribute equally).

- Achieving carbon neutrality could significantly enhance China's air quality and health. However, the differences in benefits among various carbon neutrality pathways and their distributional impacts are not well understood. This study introduces an integrated modeling framework combining an energy-economic model with detailed low-carbon technologies, a climate and atmospheric transport model, and an indoor air pollution exposure model to evaluate three technological pathways to carbon neutrality in China. We found that a

transition pathway based on wind and solar offers significantly greater health co-benefits than a biomass-based pathway but imposes a disproportionately higher cost burden on less developed regions in China.

Peer-reviewed Articles

1. Estimating Health Co-Benefits of Climate Policies in China: An Application of the Regional Emissions-Air Quality-Climate-Health (REACH) framework. **Chenfei Qu**, Xi Yang, Da Zhang and Xiliang Zhang. *Climate Change Economics*, 2020, 11(03): 2041004.
2. Exploring US-China Climate Cooperation Through Linked Carbon Markets. Alexander Li, **Chenfei Qu**, Xiliang Zhang. *Advances in Climate Change Research*, 2023, 14(1):145-155
3. The C-REM 4.0 model: A CGE Model for Provincial Analysis of China's Carbon Neutrality Target. Hantang Peng, **Chenfei Qu**, Valerie Karplus and Da Zhang. *Energy and Climate Management*, 2024.
4. Climate Actions, Persistent Pollutants, and Human Health: A Call for Integrated Assessments. Shan Niu, Minghao Qiu, Li Li, **Chenfei Qu**, Da Zhang. *Environmental Science & Technology*, 2024, 58, 36, 15885-15887.

Other Publications

1. Economic and Environmental Impacts of China's New Nationwide CO₂ Emissions Trading System: Results from a Numerical General Equilibrium Model. 2023. *Asia Society Policy Institute*.
2. *Resource for the Future* Blog: Assessing China's New Nationwide Effort to Reduce Carbon Dioxide Emissions. 2024.
3. *VoxChina* Blog: China's New Nationwide CO₂ Emissions Trading System: General Equilibrium Impacts. 2024.
4. How effective were the Chinese regional emissions trading schemes? A meta-analytic answer. *OSF pre-registration*. 2024.

Honors and Awards

1. Xie Zhenhua Global Practice Scholarship, Tsinghua University, 2024
2. Best Conference Paper Golden Prize (one out of 96) in the 2024 Conference of the Chinese Association of Environment and Resource Economists
3. China National Scholarship for Graduate Students (the highest national scholarship awarded to Chinese graduate students, with a selection rate of 0.2%), 2021
4. Outstanding Graduate Thesis, Tsinghua University, 2020
5. Outstanding Academic Performance in Globalization Program (one of 6 selected out of 140), Venice International University, 2019
6. Tsinghua Student Research Traineeship Project Excellence Award (First Prize), Tsinghua University, 2019

Conference Presentations

2023

1. NBER Environment and Energy Economics Program Meeting
2. Mannheim Conference on Energy and the Environment
3. Global Trade Analysis Project (GTAP) Annual Conference
4. International Conference of China and Development Studies
5. European Association of Environmental and Resource Economists (EAERE) Conference

2024

1. Conference of the Chinese Association of Environment and Resource Economists (CAERE)
2. Association of Environmental and Resource Economists (AERE) Conference
3. Global Trade Analysis Project (GTAP) Annual Conference
4. Workshop on Environmental and Energy Economics at Shanghai Jiao Tong University
5. 2nd China Energy Model Youth Forum

Skills

Computing: GAMS, Python, Stata, LaTeX, GIS, Mathematica

Languages: English, Mandarin

References

Carolyn Fischer

Research Manager, World Bank Development Research Group Sustainability and Infrastructure

cfischer2@worldbank.org

Lawrence H. Goulder

Shuzo Nishihara Professor in Environmental and Resource Economics, Stanford University

goulder@stanford.edu

Xiliang Zhang

Professor of Management Science and Engineering and Director of the Institute of Energy, Environment and Economy, Tsinghua University

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