Xingchi Shen

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Research interests

Energy and Environmental Economics and Policy, Electricity Economics, Social Equity, Clean Energy Technology

Employment

Yale University — New Haven, CT
Postdoctoral Associate in Energy Economics — July 2022 – Present
Supervisor: Kenneth Gillingham

Education

University of Maryland — College Park, MD
Ph.D. in Public Policy (specialization: Energy Economics) — 2018 – 2022
Dissertation Committee: Yueming (Lucy) Qiu (Chair), Joshua Linn, Nathan Hultman, Anand Patwardhan, Kavita Surana.

Shanghai Jiao Tong University — Shanghai, China
M.A. in Management — 2015 – 2018
Dept. of Public Economics and Social Policy

Shanghai Jiao Tong University — Shanghai, China
B.A. in Management — 2011 – 2015
Dept. of Public Administration

Job market paper

What matters for the racial disparity in clean heating technology adoption? Evidence from U.S. heat pumps (link)

Abstract: A growing body of literature has documented that minority groups have installed fewer clean energy technologies, but the reasons for the adoption gap are not always clear. This study utilizes household-level demographic and property data to explore the racial disparity in air source heat pump adoption in nine U.S. East Coast states. I quantify the heat pump adoption gap between White and minority households at the ZIP code level, and then use a machine learning approach to decompose the contributors to the racial disparity. The gap in building age is the most important contributor, followed by income gap, cooling degree days, and natural gas prices or access. The importance of building age persists even when conditioning on income, possibly due to historic or contemporary discrimination in housing markets. The study also provides causal evidence that an increase in heating and cooling demand and natural gas prices can widen the racial gap in heat pump adoption. Policies may not necessarily alleviate the gap though. Loan programs slightly reduce the gap, while small rebate programs widen the racial gap.

Selected working papers

Effects of rooftop solar on the distribution grid (with Kenneth Gillingham, Marten Ovaere)

Abstract: This paper estimates the effect of distributed solar generation on distribution feeders, utilizing unique, proprietary data from individual solar installations and feeders in Connecticut. We find that each additional kilowatt (kW) of distributed solar reduces the annual maximum feeder load and the top one percentile of the load by 0.11 kW. In addition, we find evidence of a 3.6% solar rebound effect, primarily occurring in spring and fall, such that it does not affect the impact of distributed solar on peak feeder loading. The economic value of avoided distribution capacity is around $2 per MWh, significantly below

the cost premium of distributed solar compared to utility-scale solar. Our estimate is an important input to policies for optimal solar investment and to the major debate on replacing solar net-metering policies.

The economic consequences of local urban gas leaks: Evidence from Massachusetts housing market (with Morgan Edwards, Yueming Lucy Qiu, Pengfei Liu)

Income and racial disparity in household publicly available EV infrastructure accessibility (with Jiehong Lou, Deb Niemeier, Nate Hultman)
Revision Requested at ***Nature Communications***

Power supply disruptions deter electrification: Empirical evidence from electric vehicle adoption (with Yueming Lucy Qiu, Nana Deng, Bo Wang, et al.)
Revision Resubmitted at ***Nature Cities***

Impacts of heatwaves on residential electricity reliability: Evidence from power outage data at households in China (with Jing Liang, Yueming Lucy Qiu, Bo Wang, Shangwei Liu)
Revision Requested at ***Nature Energy***

Assessing inequities in heat pump adoption across the U.S. (with Morgan Edwards, Jaime Garibay-Rodriguez, Jacob Shimkus Erickson, et al.)
Under review at ***Joule***

Peer-reviewed publications

The impacts of co-adopting electric vehicles, solar photovoltaics, and battery storage on electricity consumption patterns: Empirical evidence from Arizona (link)
Xingchi Shen, Yueming (Lucy) Qiu, Xing Bo, et al.
Resources, Conservation and Recycling, 2023.

The effect of rebate and loan incentives on residential heat pump adoption: Evidence from North Carolina (link)
Xingchi Shen, Yueming (Lucy) Qiu, Pengfei Liu, Anand Patwardhan.
Environmental and Resource Economics, 2022.

Empirical grid impact of in-home electric vehicle charging differs from predictions (link)
Yueming (Lucy) Qiu, Yi David Wang, Hiroyuki Iseki, Xingchi Shen, Bo Xing, Huiming Zhang.
Resource and Energy Economics, 2022.

Estimation of change in house sales prices in the US after heat pump adoption (link)
Xingchi Shen, Pengfei Liu, Yueming (Lucy) Qiu, Anand Patwardhan, Parth Vaishnav.
Nature Energy, 2021.

The impacts of special environmental events on short-run electricity-saving behaviors (link)
Xingchi Shen, Yueming (Lucy) Qiu, Ling Luo, Xiaohao Zheng.
Environmental Research Letters, 2021.

Are stay-at-home orders more difficult to follow for low-income groups? (link)
Jiehong Lou, Xingchi Shen*, Deb Niemeier. (*co-first and corresponding author)
Journal of Transport Geography, 2020.

Wind power development, government regulation structure, and vested interest groups: Analysis based on panel data of Province of China (link)

Xingchi Shen, Shoujun Lyu
Energy Policy, 2019.

The dilemma of haze governance in China—analysis based on the theory of environmental regulation (In Chinese)
Shoujun Lyu, Xingchi Shen, Xiaomin Zhang
Journal of Shanghai Jiao Tong University, philosophy and social science edition, 2015.

Honors and scholarships

University of Maryland School of Public Policy, Innovative Research Award	2021
Institute for Humane Studies, Humane Studies Fellowship	2021
US/International Association for Energy Economics, Student Paper Award	2020
University of Maryland, The Faculty-Student Research Award	2020
Shanghai (China) Outstanding Graduate Award	2018
National (China) Scholarship for Outstanding Graduate Students	2018
Award for Excellent Student Cadre of Shanghai Jiao Tong University	2016
Award for Excellent Student-Instructor of Shanghai Jiao Tong University	2016
The Top 1% (40/4000) Excellent Bachelor Thesis Prize of Shanghai Jiao Tong University	2015

Conference presentations

2024:
Allied Social Science Associations (ASSA) Annual Meeting

2023:
2023 Association for Public Policy Analysis and Management (APPAM) Annual Research Conference

2022:
ASSA Annual Meeting, 43rd APPAM Annual Research Conference (2 papers accepted; panel discussant), Northeastern Agricultural and Resource Economics Association (NAREA) Annual Meeting, 39th United States Association for Energy Economics (USAEE) North American Conference, 2022 APPAM Fall Conference (discussant for 2 sessions)

2021:
38th USAEE North American Conference, The Association of Environmental and Resource Economists (AERE) Annual Conference (2 papers accepted), The US Midwest Economics Association (MEA) Annual Conference, The US Eastern Economic Association (EEA) Annual Conference, 43rd International Association of Energy Economics (IAEE) International Conference

2020:
The Behavior, Energy & Climate Change (BECC) 2020 Conference, 42nd APPAM Annual Research Conference, 2020 Asian Association for Public Administration (AAPA) Annual Conference, The AERE Annual Conference (poster, canceled due to COVID-19), NAREA Annual Meeting, APPAM Student Seminar

before 2019:
41st APPAM Annual Research Conference, 37th USAEE North American Conference, 1st DC Area Student/Professor Environmental and Energy Economics Workshop, Global City Forum, HKU-USC-IPPA Conference on Public Policy

Teaching experience

Guest Lecturer, Microeconomics and Policy Analysis (graduate level), University of Maryland	2023

Guest Lecturer, Machine Learning in Social Science (PhD level), University of Maryland 2023
Guest Lecturer, Climate Policy (undergraduate level), University of Maryland 2023
Guest Lecturer (×2), Energy Economics (graduate level), University of Maryland 2022
Guest Lecturer (×2), Machine Learning in Social Science (PhD level), University of Maryland 2021
Teaching Assistant, International Macroeconomics (graduate level), University of Maryland 2021
Guest Lecturer, Energy Economics (graduate level), University of Maryland 2020

Academic services

Workshop organizer, International Workshop on "Empirical Methods in Energy Economics", Yale University. 2023

Conference abstract reviewer: Association for Public Policy Analysis and Management Annual Conference; Annual National Conference of the U.S. Association for Energy Economics 2023

Poster session judge, U.S. Association for Energy Economics North American Conference. 2022

Journal manuscript reviewer:
PNAS, Nature Climate Change, The Energy Journal, Energy Economics, Energy Research & Social Science, Environmental Research Letters, Energy Policy, The Electricity Journal (×2), PLOS ONE (×2), Travel Behaviour and Society, Environmental Research Communications (×3), Environmental Impact Assessment Review, The Extractive Industries and Society

Social services

Deputy Secretary General of the Students' Union, Shanghai Jiao Tong University 2014-2016

- Managed and conducted the Students' Union of SJTU, which has about 1000 members.
- Provided guidance and leadership to the student associations' union, serving ca. 300 student associations.
- Organized the fifth Youth Culture & Creation Festival in 2016, which attracted almost 15,000 visitors.

Media coverage

Bloomberg, "Replace a Fossil Fuel Furnace to Lower Emissions—and Your Bills" Nov 24, 2020
(reprinted by Detroit News, Lancaster online, Finger Lakes Times, and Arcamax.)
ABC 6 News, "Installing heat pump could save energy costs & increase home value" Oct 29, 2020
Tech Xplore, "Energy efficient heat pump technology increases the value of homes in the U.S." Oct 21, 2020
Knowridge Science Report, "Energy efficient heat pumps increase the value of homes in the U.S., shows study" Oct 22, 2020
Thomas Insights, "Energy-efficient Heat Pump Technology Increases the Value of Homes" Jul 23, 2021
pv magazine, "Air source heat pumps raise home prices" Aug 23, 2021

Programming & software

Python, Stata, QGIS, R, Stan, LaTeX, Adobe Suite, Office Suite, Origin, Tableau

Language

English (fluent); Chinese (native)