XIAOCHEN SUN
H. John Heinz III College
Carnegie Mellon University
4800 Forbes Ave.
Pittsburgh, PA 15213

Email: xiaoches@andrew.cmu.edu
Website: https://xiaochensun.netlify.app

Curriculum Vitae
October 2023

EDUCATION

Carnegie Mellon University, Pittsburgh, PA — 2018 – 2024 (expected)
Ph.D. Public Policy and Management
Advisors: Karen Clay (co-chair), Edson Severnini (co-chair), and Akshaya Jha

Duke University, Durham, NC — 2013 – 2015
M.S. Environmental Economics and Policy
Certificate of Sustainable System Analysis

Renmin University of China, Beijing, China — 2009 – 2013
B.A. Environmental Economics

RESEARCH INTERESTS

Energy and Environmental Economics, Public Economics, Empirical Industrial Organization

PUBLICATIONS

"Does LEED Certification Save Energy? Evidence from Retrofitted Federal Buildings", joint with Karen Clay and Edson Severnini, *Journal of Environmental Economics and Management* 121: 102866, 2023 (*NBER Working Paper No. 28612* and *IZA Discussion Paper No. 14211*) *(Also featured in NBER Research Spotlight, 7/15/2021).*

WORKING PAPER

Impacts of Uncertainty in Transmission Interconnection on Energy Transition (*Job Market Paper*)

WORK IN PROGRESS

"Impact of a Cap-and-Trade Program on Local Air Pollution: Evidence from the Acid Rain Program", joint with Karen Clay and Edson Severnini

PRESENTATIONS

2023 Carnegie Mellon Electricity Industry Center (CEIC), Property and Environment Research Center (PERC), Empirical Methods in Energy Economics (EMEE)

2022 Northeast Workshop on Energy Policy and Environmental Economics, Association of Environmental and Resource Economics (AERE) Annual Summer Conference

2021 Northeast Workshop on Energy Policy and Environmental Economics (Attendee), Association of Environmental and Resource Economics (AERE) Annual Summer Conference, Student Research Seminar of Association for Public Policy Analysis & Management (APPAM), Midwest Energy Fest, 1st Workshop in Applied Microeconomics of Association for Mentoring & Inclusion in Economics (AMIE)

AWARDS AND FELLOWSHIPS

Heinz College PhD Fellowship, Carnegie Mellon University 2018 – present
Property and Environment Research Center (PERC) Graduate Fellowship 2023
CMU Graduate Student Assembly / Provost Conference Funds 2022
Mentee, Association for Mentoring & Inclusion in Economics (AMIE) 2021
Attendee, Berkeley/Sloan Summer School in Environmental and Energy Economics 2019
Merit-based Scholarship, Duke University 2013 – 2014
Third Award in the 14th Innovation Cup for Student Research Paper 2012
Undergraduate Fellowship for Excellent Academic Performance 2010 – 2011
Dean's List, Renmin University of China 2010

TEACHING EXPERIENCE

Recitation Instructor, CMU Heinz College

- 95-710 Economics Analysis, by Karen Clay 2019 – 2023
- 94-834 Applied Econometrics I, by Edson Severnini and Akshaya Jha 2019 – 2023
- 94-835 Applied Econometrics II, by Akshaya Jha 2020 – 2023

Course Design, CMU Heinz College

- 90-711 Statistical Reasoning with R, by Amelia Haviland 2020 Summer

PROFESSIONAL EXPERIENCE

Duke University Energy Initiative, Durham, NC October 2015 – June 2018
Research Analyst, worked with William Pizer and Kyle Bradbury

Smart Electric Power Alliance, Washington, D.C. September 2015 – October 2015
Research Intern

Greenpeace, Washington, D.C. May 2014 – July 2014
Energy Research Fellow

ACTIVITIES

PhD Representative, Heinz College, Carnegie Mellon University, 2021 – 2023

REFEREE SERVICE

Abstract Reviewer: Association of Environmental and Resource Economics (AERE) 2023 Summer Conference

OTHER INFORMATION

Software:	Stata, Python, R, MATLAB
Affiliations:	American Economic Association (AEA), Association of Environmental and Resource Economists (AERE)
Languages:	English (fluent), Mandarin (native), Japanese (beginner)

REFERENCES

Karen Clay (co-chair)	Edson Severnini (co-chair)	Akshaya Jha
Heinz College	Heinz College	Heinz College
Carnegie Mellon University	Carnegie Mellon University	Carnegie Mellon University
Pittsburgh, PA 15213	Pittsburgh, PA 15213	Pittsburgh, PA 15213
412-268-4197	412-268-2329	608-347-2102
kclay@andrew.cmu.edu	edsons@andrew.cmu.edu	akshayaj@andrew.cmu.edu

DISSERTATION ABSTRACT

Chapter 1: Does LEED Certification Save Energy? Evidence from Retrofitted Federal Buildings

with Karen Clay and Edson Severnini

This paper examines the causal impact of LEED (Leadership in Energy & Environmental Design) certification on energy consumption among federally owned buildings that were retrofitted over the period 1990–2019. Using a difference-in-differences propensity score matching approach, the paper has two findings. First, despite energy savings being an explicit federal goal, LEED-certified retrofits of federal buildings did not have statistically significant energy savings on average. Second, LEED buildings with higher energy scores had greater energy efficiency post-certification, and the improvements were economically meaningful. The absence of energy savings on average appears to be driven by three factors — trade-offs across energy and other areas in acquiring points for certification, possible changes in energy use after the official performance period for LEED certification ended, and improvements in the energy efficiency of all federal buildings.

Chapter 2: Impact of a Cap-and-Trade Program on Local Air Pollution: Evidence from the Acid Rain Program
with Karen Clay and Edson Severnini

As the first nationwide cap-and-trade program, the Acid Rain Program (ARP) was enacted under Title IV of the 1990 Clean Air Act (CAA) to reduce SO_2 emissions from the power sector and address the acid rain problem. SO_2 is considered locally harmful in terms of health, acid rain, and visibility. Moreover, locations with ARP plants are already disadvantaged with high SO_2 levels and historically underprivileged populations. In this study, we examine the average and heterogeneous impacts of ARP on local SO_2 concentration in the locations of targeted plants relative to places that were not directly affected by the program. Applying difference-in-differences models with plant location SO_2 concentration from NASA satellite data, we find the SO_2 concentration reduction was around 7-8% slower within a 50-km radius of ARP plant locations relative to control group areas. We also show that months with the highest pollution readings within a year were systematically omitted in the EPA monitoring network. Lastly, our heterogeneity analysis suggests that locations with fewer unused permit allocation, more permits trading, and lower average proprietary income experienced more rapid decline in SO_2 concentration.

Chapter 3: Impacts of Uncertainty in Transmission Interconnection on Energy Transition
(Job Market Paper)

This paper investigates the impact of uncertainty in interconnection cost allocation on generators' decision to stay in the process. The study delves into a three-stage interconnection process that electric transmission system operators mandate for generators seeking grid access. Recent years have seen a surge in interconnection requests alongside a persistent trend of high project withdrawals, leading to a challenging backlog. This backlog poses a significant threat to electric grid resilience and energy transition, which is essential to combat climate change. A key reason for the high withdrawal rates is the uncertainty associated with the interconnection cost allocation under current policy. To estimate this impact, the study employs a dynamic discrete choice model with Bayesian learning to capture the evolving means and variances of interconnection cost signals across different stages of the process, as cost uncertainty decreases with progress. Parameter estimates highlight that generators are more likely to stay when cost uncertainty is high, emphasizing the value of learning. Furthermore, the effect of network upgrade costs varies by fuel source, with wind generators being most sensitive. The paper presents two counterfactual analyses to inform discussions concerning FERC Order 2023. First, I show that interconnection studies should prioritize providing more accurate information early in the process to encourage early learning, thus facilitating early decision-making to alleviate backlog issues. Second, I find increasing withdrawal penalties may not significantly address backlog concerns. Additionally, subsidy policies regarding network upgrades may be most effective when tailored to specific fuel types.