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Education

Harvard University
Ph.D., Economics, 2027 (expected)

Williams College
B.A., Economics and Mathematics, *magna cum laude*, 2019

Fields

Primary fields: Environmental economics, public economics
Secondary fields: Urban economics

References

Jesse Shapiro
Harvard University
jesse.m.shapiro@gmail.com

James Stock
Harvard University
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Edward Glaeser
Harvard University
eglaeser@harvard.edu

Anna Russo
Harvard University
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Fellowships & Awards

National Tax Association Climate Tax Fellow, 2025
Harvard Economics Prize for Best Third-Year Paper, 2024
NSF Graduate Research Fellow, 2023
Harvard Environmental Economics Program Doctoral Student Fellow, 2021–present

Teaching

The Economics of Climate Change (undergraduate), Harvard University, 2025
Public Economics and Fiscal Policy I (PhD), Harvard University, Stefanie Stantcheva, 2023
Price and Allocation Theory (undergraduate), Williams College, Sarah Jacobson, 2018
Discrete Mathematics (undergraduate), Williams College, Peyam Tabrizian, 2017

Research

Research Assistant to Clare Balboni, Massachusetts Institute of Technology, 2022
Research Assistant to Owen Zidar, Princeton Program in Public Finance, 2019–2021
Research Assistant, Treasury Department Office of Economic Policy, 2017

Job Market Paper

Data Centers: Location Choice and Grid Externalities
with Yixin Zhou

Data centers already account for 5% of U.S. electricity consumption, a share that is projected to rise dramatically as new facilities come online. The electricity price and emissions effects of data center growth depend on where it occurs: data centers drive up prices more in locations with steep electricity supply curves and increase emissions more in places with carbon-intensive marginal generation. We combine a dispatch model with a model of data center location choice to quantify price and emissions effects, how geography shapes these effects, and how public policies can shift them by altering location choice. We find that data centers disproportionately locate in places with relatively flat supply curves, a pattern that has attenuated their effects on consumer electricity prices. Although single-state data center moratoria can reduce local electricity prices, they can magnify the national price and emissions impacts of data center growth by pushing facilities into locations with steeper supply curves or more carbon-intensive marginal generation.

Working Papers

Incentives to Emit in Upstream Oil and Gas: Theory, Evidence, and Policy Implications
with Toren Fronsdal

We study how market incentives and infrastructure constraints shape oil and gas industry methane emissions. We develop a model in which producers make drilling and emissions decisions and face transmission costs that depend on aggregate pipeline utilization. Leveraging novel emissions data for the Permian Basin, we show that emissions respond to high-frequency price variation as predicted by the model. We use our estimated model to evaluate policies. A methane tax reduces emissions by up to 14 percent, but pipeline congestion significantly attenuates its effectiveness. Expanding gas pipeline infrastructure yields net emission reductions and generates social returns substantially exceeding construction costs.

Mapping the Scale and Geography of U.S. Data Centers
with Garrison Schlauch, Simon Greenhill, Kevin Butler, Gianluca Guidi, and Falco Bargagli Stoffi

Data centers are among the most consequential infrastructure investments of recent decades. Yet, basic facts about them remain remarkably hard to pin down: how many there are, where they sit, how large they are, and when they opened. This is a critical problem because estimating their effects on the grid, electricity prices, water, noise, air pollution, and carbon emissions requires exactly those facts. However, operators report nothing to a central registry, leaving a handful of commercial datasets that cover different slices of the industry and often disagree. Here we combine four data sources with geospatial checks and targeted manual validation to characterize 2,742 operational and planned U.S. data center campuses, with 60 GW of operational capacity by the end of 2025. Existing sources differ systematically in their representation of campus types and regions, and give answers to basic questions such as total data center capacity that differ up to fourfold across commercial sources. Harmonization and validation identify 689 large campuses as likely operational by the end of 2025 with a validated opening year, 1.4–4.3 times as many as any single commercial source. The combined dataset also improves coverage of campuses that opened before 2020. Hyperscale and cryptomining capacity are geographically concentrated, with Texas accounting for more than half of cryptomining capacity and Virginia having the largest concentration of hyperscale and colocation data centers. While the current growth in the number of data centers is comparable to earlier growth, the scale of new data center power capacity is unprecedented. Together, these findings highlight the importance of consistent, timely infrastructure reporting to assess data centers' impacts and inform planning. We provide public aggregate data and code enabling licensed users to reconstruct the campus dataset.

Papers in Progress

Environmental Regulation with Cross-Border Spillovers: Evidence from New Mexico's Gas Waste Rules
with Toren Fronsdal

We evaluate New Mexico's 2021 gas waste rules for the oil and gas industry, which tightened limits on routine flaring and imposed penalties for noncompliance. A simple conceptual framework highlights three margins of response: venting and flaring, drilling, and reporting. The reporting margin arises because compliance is based on self-reported gas waste. Because many producers operate in both New Mexico and Texas, the policy may spill across state lines: firm-wide abatement may reduce gas waste outside New Mexico, while displaced drilling may shift elsewhere, muting the policy's aggregate effect. Using a cross-border difference-in-differences design in the Permian Basin, we compare outcomes in New Mexico and Texas before and after the policy change. Standard cross-border comparisons may be biased because spillovers partially treat the Texas comparison group. We address this problem with an operator-level decomposition that identifies direct effects in New Mexico and spillovers onto exposed firms' Texas assets. Among operators initially above the regulatory threshold, the policy lowered venting-and-flaring intensity by 3.9 percentage points in New Mexico and by 1.6 percentage points on the Texas assets of exposed firms, corresponding to declines of 92% and 32%, respectively. Accounting for these spillovers, overall

gas waste fell by 54% in New Mexico and 14% in Texas. We find no evidence that the policy changed drilling activity or induced underreporting of gas waste.

Seminars & Conferences

2026: Women in Environmental Economics Workshop (CEPR/Warwick); Southeastern Workshop on Energy & Environmental Economics & Policy (Georgia Tech); Consortium of Environmentally Resilient Business Symposium (University of Arizona); Williams College

2025: AAEA Annual Meeting; Econometric Game

2024: AERE Summer Meeting; Machine Learning in Economics Summer Institute; Doctoral Student Participatory Workshop on Climate and Energy Decision Making (Carnegie Mellon)

2023: USAEE

2022: Chicago Price Theory Summer Camp; Berkeley/Sloan Summer School in Environmental and Energy Economics

Academic Service

Referee: *Quarterly Journal of Economics, Journal of Urban Economics, PNAS*

Organizer: Graduate Student Workshop in Environmental Economics (2024-2026), Pre-doctoral Research in Economics Workshop (2021)

President, Harvard Graduate Economics Association (2022–2023)

Mentor, Economics Mentoring Program (2022–2024)

Co-author, Econ RA Guide (2020)

Research Grants

Salata Initiative on Reducing Global Methane Emissions, Harvard University (2023-2025)
Chae Family Economics Research Fund, Harvard University (2023)
Kenneth C. Griffin Economics Research Funds, Harvard University (2024)
Lab for Economic Applications and Policy Research Grant, Harvard University (2025)

Languages

English (*native*), French (*intermediate*), Spanish (*intermediate*), Mandarin Chinese (*intermediate*)

Software Skills

Proficient in Stata, R, Python, LaTeX, Git, and Excel