

CATHERINE D. WOLFRAM
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CURRENT POSITIONS

Deputy Assistant Secretary for Climate and Energy Economics, US Treasury, March 2021-present
Cora Jane Flood Professor of Business Administration, Haas School of Business, UC Berkeley,
July 2013-present [ON LEAVE]
Affiliated Faculty, Department of Agriculture and Resource Economics, UC Berkeley, July 2006-
present [ON LEAVE]
Affiliated Faculty, Energy and Resources Group, UC Berkeley, July 2001-present [ON LEAVE]

PREVIOUS POSITIONS

Associate Dean for Academic Affairs, Haas School of Business, UC Berkeley, July 2019-February
2021
Acting Associate Dean for Academic Affairs, Haas School of Business, UC Berkeley, July 2018-
June 2019
Associate Professor of Business Administration (with tenure), Haas School of Business, UC
Berkeley, July 2005-June 2013
Assistant Professor of Business Administration, Haas School of Business, UC Berkeley, July
2000-June 2005
Assistant Professor of Economics, Harvard University, July 1996 to June 2000
Visiting Research Associate, University of California Energy Institute, Spring 1999
Electric Utility Rate Analyst, Massachusetts Department of Public Utilities, October 1990 to July
1992
Research Assistant, Putnam, Hayes and Bartlett, August 1989 to October 1990

EDUCATION

Ph.D., Economics, MIT, June 1996. Thesis on "Empirical Studies of the British Electricity
Industry Before and After Privatization"
A.B., Economics, Harvard University, *magna cum laude*, June 1989

HONORS, FELLOWSHIPS AND GRANTS

(Total grant funding exceeds \$30 Million)

2020: Principal Investigator, “Resilience to Economic Shocks through Continued Electricity Access” funded by the International Growth Centre, Private Enterprise Development in Low-Income Countries

2020: Principal Investigator, “CALifornia Power Outage and Wildfires Economics Research” (CALPower) funded by the Sloan Foundation

2019-2021: Principal Investigator, “Ghana Power Compact Impact Evaluation,” funded by the Millennium Challenge Corporation

2019-2021: Principal Investigator, “Measuring Grid Reliability in Accra, Ghana,” funded by the Millennium Development Authority

2018-2021: Co-Principal Investigator, “E2e Evidence-Based Policy Fellowships” (with Michael Greenstone and Chris Knittel), funded by the Alfred P. Sloan Foundation

2018-2020: Principal Investigator, “CEC/UCB Postdoctoral Fellow in Energy Data,” funded by the California Energy Commission

2018-2021: Co-Principal Investigator, “The Political Economy of Rural Electrification” (with Ted Miguel), funded by the Department for International Development

2018-2019: Co-Principal Investigator, “Measuring Electricity Reliability with ‘GridWatch’ Sensors in West Africa” (with Prabal Dutta and Jay Taneja), funded by the Department for International Development

2017-2018: Co-Principal Investigator, “A Pilot Study of Novel Low-Cost Technologies for Measuring Electricity Reliability in Urban Ghana” (with Prabal Dutta and Jay Taneja), funded by the Millennium Challenge Corporation

2016-2018: Research Director, “Energy for Economic Growth” (with Paul Gertler, Neil McCulloch and Marcela Tarazona), funded by the Department for International Development

2015-2018: Co-Principal Investigator, “The E2e Project: Evidence for Action on Energy Efficiency” (with Michael Greenstone and Chris Knittel), funded by the Alfred P. Sloan Foundation

2015-2018: Co-Principal Investigator, “Unlocking Industrial Energy Efficiency through Optimized Energy Management Systems” (with Michael Greenstone and Chris Knittel), funded by California Energy Commission

2015-2016: Co-Principal Investigator, “Smart Meters for Promoting Energy Efficiency in Rural India” (with Meredith Fowlie), funded by International Growth Centre

2014-2016: Principal Investigator, “Energy Efficiency Evaluation Project and Technical Support for Energy Division Staff,” funded by California Public Utilities Commission

2014-2016: Co-Principal Investigator, “Intelligent Electrification: Bringing Smart Grids to Rural India” (with Yashraj Khaitan, Meredith Fowlie, Edward Miguel and Eric Brewer), funded by USAID

2013-2014: Co-Principal Investigator, “Center for Energy Efficiency Research and Outreach” (with Elizabeth Bailey, Chris Knittel, and Michael Greenstone), funded by the Alfred P. Sloan Foundation

2012-2015: Co-Principal Investigator, “Microgrids Development Project” (with Edward Miguel), funded by USAID

- 2010-2012: Co-Principal Investigator, “Reducing Energy Consumption and Greenhouse Gas Emissions through Energy-Efficiency Retrofits: Evidence from Low-Income Households” (with Meredith Fowlie and Michael Greenstone), funded by the Alfred P. Sloan Foundation
- 2010-2012: Co-Principal Investigator, “Smart Grid and Dynamic Pricing: Large-Scale Demonstration Projects” (with Meredith Fowlie), funded by the Department of Energy
- 2010-2011: Co-Principal Investigator, “Randomized Encouragement Design Analysis of the DOE Weatherization Assistance Program” (with Meredith Fowlie), funded by the Department of Energy
- 2009-2010: Co-Principal Investigator, “The Design and Implementation of U.S. Climate Policy” (with Don Fullerton), funded by the Smith Richardson Foundation
- 2008: Recipient, Cheit Award for Best Teacher in Haas Evening MBA Program
- 2006: Recipient, Cheit Award for Best Teacher in Haas Evening MBA Program
- 2004: American Statistical Association/Energy Information Administration Research Fellow
- 2003-2005: Sloan Foundation-NBER International Productivity Project
- 1998-1999: National Science Foundation Award for Beginning Academics (Grant No. SBR-9810402)
- 1996-1997: American Compensation Association Emerging Scholar Program
- Spring 1996: Review of Economic Studies Tour
- 1995-1996: Harvard/MIT Research Training Group in Positive Political Economy Fellowship
- 1992-1995: National Science Foundation Graduate Fellowship

RESEARCH

Journal Publications:

- “Low Energy: Estimating Electric Vehicle Electricity Use,” joint with Fiona Burling, James Bushnell, and David Rapson. Forthcoming, ***American Economic Review Papers and Proceedings***, May 2021.
- “Default Effects and Follow-On Behavior: Evidence from an Electricity Pricing Program,” with Meredith Fowlie, Patrick Baylis, C. Anna Spurluck, Annika Todd, and Peter Cappers. Forthcoming, ***Review of Economic Studies***.
- “Machine Learning from Schools about Energy Efficiency,” with Fiona Burlig, Chris Knittel, David Rapson and Mar Reguant. ***Journal of the Association of Environmental and Resource Economists***, 2020, Vol. 7(6): 1181-1217.
- “Experimental Evidence on the Economics of Rural Electrification,” with Kenneth Lee and Edward Miguel. ***Journal of Political Economy***, 2020, Vol. 128 (4): 1523-1565.

- “Does Household Electrification Supercharge Economic Development?,” with Kenneth Lee and Edward Miguel. *Journal of Economic Perspectives*, 2020, Vol. 34 (Winter): 122-44.
- “Heat Exposure and Global Air Conditioning,” with Leopold Biardeau, Lucas Davis, and Paul Gertler. *Nature Sustainability*, 2020, Vol. 3 (January): 25-28.
- “Power Quality and Modern Energy for All,” with Veronica Jacome, Noah Klugman, Belinda Grunfeld, Duncan Callaway, and Isha Ray. *Proceedings of the National Academy of Science*, 2019, Vol. 116 (33): 16308-16313.
- “Solar Microgrids and Remote Energy Access: How Weak Incentives Can Undermine Smart Technology,” with Meredith Fowlie, Yashraj Khaitan, and Derek Wolfson. *Economics of Energy and Environmental Policy*, 2019, Vol. 8 (1): 59-83.
- “Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program,” with Meredith Fowlie and Michael Greenstone. *Quarterly Journal of Economics*, 2018, Vol. 133 (3): 1597-1644.
- “Running Randomized Field Experiments for Energy Efficiency Programs: A Practitioner’s Guide,” with Raina Gandhi, Christopher R. Knittel, Paula Pedro. *Economics of Energy and Environmental Policy*, 2016, Vol. 5 (2): 7-26.
- “The Demand for Energy-Using Assets among the World’s Rising Middle Classes,” with Alan Fuchs, Paul Gertler, and Orie Shelef. *American Economic Review*, 2016, Vol. 106 (June): 1355-1401.
- “Appliance Ownership and Aspirations among Electric Grid and Home Solar Households in Rural Kenya,” with Ken Lee and Edward Miguel, *American Economic Review Papers and Proceedings*, 2016, Vol. 106 (May): 89-94.
- “Under the Grid? Barriers to Electrification in Rural Kenya,” with Eric Brewer, Carson Christiano, Kenneth Lee, Francis Meyo, Edward Miguel, Matt Podolsky, and Javier Rosa, *Development Engineering*, 2016, Vol. 1 (June): 26-35.
- "The Frontiers of Energy: Quantifying Change." *Nature Energy*, 2016, Vol. 1 (January).
- “Cursed Resources? Political Conditions and Oil Market Outcomes,” with Gilbert Metcalf, *Energy Journal*, 2015, Vol. 36 (July): 331-357.
- “Are the Non-Monetary Costs of Energy Efficiency Investments Large? Understanding Low Take-up of a Free Energy Efficiency Program,” with Meredith Fowlie and Michael Greenstone, *American Economic Review Papers and Proceedings*, 2015, Vol. 105 (May): 201-204.

- “An Economic Perspective on the EPA’s Clean Power Plan,” with Meredith Fowlie, Lawrence Goulder, Matthew Kotchen, (lead authors) James Bushnell, Lucas Davis, Michael Greenstone, Charles Kolstad, Christopher Knittel, Robert Stavins, Michael Wara, and Frank Wolak. *Science*, 2014, Vol. 346 (November): 815-816.
- “Powering up China: Income Distributions and Residential Electricity Consumption,” with Max Auffhammer, *American Economic Review Papers and Proceedings*, 2014, Vol. 104 (May): 575-580.
- “‘Opt-Out’ Rates at Motherhood across High-Education Career Paths: Selection versus Work Environment,” with Jane Leber Herr, *Industrial and Labor Relations Review*, 2012, Vol. 65 (October): 928-950.
- "Deregulation, Consolidation and Efficiency: Evidence from U.S. Nuclear Power," with Lucas Davis, *American Economic Journal: Applied Economics*, 2012, Vol. 4 (October): 194-225.
- “Enforcement of Vintage Differentiated Regulations: The Case of New Source Review,” with James Bushnell, *Journal of Environmental Economics and Management*, 2012, Vol. 64 (September): 137-152.
- “Dynamic Pricing of Electricity,” with Paul Joskow, *American Economic Review Papers and Proceedings*, 2012, Vol. 102 (May): 381-385.
- “How Will Energy Demand Develop in the Developing World?” with Orie Shelef and Paul Gertler, *Journal of Economic Perspectives*, 2012, Vol. 26 (Winter): 119-138.
- “Sacred Cars? Cost-Effective Regulation of Stationary and Non-stationary Pollution Sources,” with Meredith Fowlie and Christopher Knittel, *American Economic Journal: Economic Policy*, 2012, Vol. 4 (February): 98-126.
- “Local Solutions to Global Problems: Climate Change Policy and Regulatory Jurisdiction,” with James Bushnell and Carla Peterman, *Review of Environmental Economics and Policy*, 2008, Vol. 2 (Summer): 175-193.
- “Inefficiencies and Market Power in Financial Arbitrage: A Study of California’s Electricity Markets,” with Severin Borenstein, James Bushnell, and Christopher Knittel, *Journal of Industrial Economics*, 2008, Vol. 56 (June): 347-378.
- “Do Markets Reduce Costs? Assessing the Impact of Regulatory Restructuring on US Electric Generation Efficiency” with Kira Fabrizio and Nancy Rose, *American Economic Review*, 2007, Vol. 97 (September): 1250-1277.

“Coordinating on Lower Prices: Pharmaceutical Pricing under Political Pressure,” with Sara Fisher Ellison, *RAND Journal of Economics*, 2006, Vol. 37 (Summer): 325-341.

“Why Do Manufacturers Issue Coupons? An Empirical Analysis of Breakfast Cereals,” with Aviv Nevo, *RAND Journal of Economics*, 2002, Vol. 33 (Summer): 319-339.

“Regulating Executive Pay: Using the Tax Code to Influence CEO Compensation,” with Nancy Rose, *Journal of Labor Economics*, 2002, Vol. 20 (April): S138-S175.

“Has the “Million-Dollar Cap” Affected CEO Pay?” with Nancy Rose, *American Economic Review Papers and Proceedings*, 2000, Vol. 90 (May): 197-202.

"Measuring Duopoly Power in the British Electricity Spot Market," *American Economic Review*, 1999, Vol. 89 (September): 805-826.

"Strategic Bidding in a Multiunit Auction: An Empirical Analysis of Bids to Supply Electricity in England and Wales," *RAND Journal of Economics*, 1998, Vol. 29 (Winter): 703-725.

"Increases in Executive Pay Following Privatization," *Journal of Economics and Management Strategy*, 1998, Vol. 7 (Fall): 327-361 (*lead article*).

“Decomposing the Sources of Incumbency Advantage in the U.S. House,” with Steven D. Levitt, *Legislative Studies Quarterly*, 1997, Vol. 22 (February): 45-60.

"Political Constraints on Executive Compensation: Evidence From the Electric Utility Industry," with Paul Joskow and Nancy Rose, *RAND Journal of Economics*, 1996, Vol. 27 (Spring): 165-182.

Other Publications:

“[Hardware, Apps, and Surveys at Scale: Insights from Measuring Grid Reliability in Accra, Ghana](#),” with Noah Klugman, Joshua Adkins, Susanna Berkouwer, Kwame Abrokwhah, Ivan Bobashev, Patrick Pannuto, Matthew Podolsky, Aldo Susenot, Revati Thatte, Jay Taneja, and Prabal Dutta. 2019 The second annual ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS '19). July 2019.

“Experience: Android Resists Liberation from Its Primary Use Case,” with Noah Klugman, Veronica Jacome, Meghan Clark, Matthew Podolsky, Patrick Pannuto, Neal Jackson, Aley Soud Nassor, Duncan Callaway, Jay Taneja, and Prabal Dutta. In Proceedings of the 24th Annual International Conference on Mobile Computing and Networking (MobiCom '18). October 2018.

“Does Solving Energy Poverty Help Solve Poverty?” with Ken Lee and Edward Miguel, *Oxford Economic Forum*, September 2018, Issue 115.

“The Guy at the Controls: Labor Quality and Power Plant Efficiency,” with James Bushnell, in Richard Freeman and Kathryn Shaw, eds., International Differences in the Business Practices and the Productivity of Firms. University of Chicago Press, 2009

Book review of The Unsustainable Costs of Partial Deregulation, by Paul W. MacAvoy, *Journal of Economic Literature*, 2008, Vol. 46 (December): 1030-1032

“Electricity Markets,” with James Bushnell, in S. N. Durlauf and L. E. Blume, eds., The New Palgrave Dictionary of Economics, Second Edition, 2008

“The Efficiency of Electricity Generation in the U.S. After Restructuring,” in James Griffin and Steve Puller, eds., Electricity Deregulation: Choices and Challenges. University of Chicago Press, 2005

“Pricing Security,” with L. Jean Camp, in L. Jean Camp and Stephen Lewis, eds., Economics of Information Security, vol. 12, *Advances in Information Security*. Springer-Kluwer, 2004

"Comments on 'The Adoption and Impact of Advanced Emergency Response Services'," by Susan Athey and Scott Stern, and "Comments on 'Comparing Hospital Quality at For-Profit and Not-for-Profit Hospitals'," by Mark McClellan and Douglas Staiger, in David Cutler, ed., The Changing Hospital Industry. University of Chicago Press, 2000

"Electricity Markets: Should the Rest of the World Adopt the United Kingdom's Reforms?" *Regulation*, 1999, Vol. 22, (4): 48-53

Popular Press Columns:

"What Are You Getting If You Buy Clean Electricity?" *San Jose Mercury News*, September 5, 2018

"Despite \$7 Billion to 'Power Africa,' Why the Continent is Still in the Dark," with Ken Lee, Francis Moyo and Edward Miguel, *Reuters*, July 30, 2015

"Water Conservation's Other Benefit: It's a Power Saver, " with David Zetland, *Los Angeles Times*, March 3, 2014

"Energy Efficiency Needs More Research," with Elizabeth Bailey and Christopher R. Knittel, *USA Today*, February 28, 2013

"What Can California Learn from Clothier about Energy Efficiency?" *Sacramento Bee*, January 16, 2013

"A Whole Different Kind of Innovation," with Elizabeth M. Bailey, *Wall Street Journal*, June 18, 2012

"Fighting Climate Change with Low-Tech Tools," *Bloomberg* Business Class, May 20, 2012

"Rising Middle Class Fuels Global Energy Surge," *Bloomberg* Business Class, Jan. 17, 2012

Working Papers:

"E-Collateral: Unlocking Access to Credit via Digital Repossession," with Paul Gertler and Brett Green.

"Air Conditioning and Global Inequality," joint with Lucas Davis, Paul Gertler and Stephen Jarvis

"The Political Economy of Rural Electrification in Kenya," with Susanna B. Berkouwer, Eric Hsu, Oliver W. Kim, Edward Miguel, and Felipe Vial

"California's Greenhouse Gas Policies: How Do They Add Up?" with James Bushnell and Carla Peterman. Revise and resubmit, *Energy Journal*.

"Do Households Smooth Small Consumption Shocks? Evidence from Anticipated and Unanticipated Variation in Home Energy Costs," with Julie Cullen and Leora Friedberg.

"Ownership Change, Incentives and Plant Efficiency: The Divestiture of US Electric Generation Plants," with James Bushnell.

Books:

The Design and Implementation of U.S. Climate Policy, edited with Don Fullerton. University of Chicago Press, September 2012.

PROFESSIONAL ACTIVITIES

Positions Held

Program Director, Environmental and Energy Economics Program, National Bureau of Economic Research, August 2016-February 2021

Faculty Director, Energy Institute at Haas, July 2009-June 2018

Faculty Director, The E2e Project, January 2013-February 2021

Scientific Director for Energy & Environment, Center for Effective Global Action (CEGA),
January 2015-present [ON LEAVE]
Research Associate, National Bureau of Economic Research, September 2006-July 2016
Faculty Affiliate, J-PAL, July 2014-present [ON LEAVE]
Faculty Affiliate, CEGA, March 2013-present [ON LEAVE]
University Fellow, Resources for the Future, May 2015-present
Faculty Scientist, Energy Technologies Area, Lawrence Berkeley National Laboratory, September
2009-present [ON LEAVE]
Member, National Academy of Sciences Committee on the Effects of Provisions in the Internal
Revenue Code on Greenhouse Gas Emissions, April 2011-June 2013
Board of Directors, Association of Environmental and Resource Economics, January 2009-
December 2011
Board of Editors, *The Energy Journal*, July 2002-present [ON LEAVE]
Associate Editor, *Journal of Economic Perspectives*, December 2016-December 2019
Associate Editor, *Journal of Industrial Economics*, July 2005-July 2011
Associate Editor, *Economic Journal*, April 2008-April 2011
Associate Editor, *RAND Journal of Economics*, March 2012-July 2015

Invited Presentations

“Randomised Controlled Trials on Energy: Perspectives from Kenya and Ghana,” Keynote
Address at Randomised Controlled Trials hosted by Monash University, December 12,
2019.

“The Green Transition in Sub-Saharan Africa: Perspectives from Kenya and Ghana,” Keynote
Address at Environmental Economics and the Green Transition Conference hosted by the
European Bank for Redevelopment, June 13, 2019.

"Energy Policy: Perspectives from California, Kenya, and Ghana," Purvis Luncheon Lecture at
the 53rd Annual Conference of the Canadian Economics Association, June 1, 2019.

“Global Energy Consumption: Where Is It Headed? What Are the Impacts?” Keynote Address at
3rd Shanghai Green Finance Conference, May 26, 2019.

“Field Experiments on Electrification: Lessons from Successes and Failures?” Keynote Address
at Advances with Field Experiments Conference 2018, October 5, 2018.

“Energy in the Developing World: Perspectives from the Field,” Keynote Address at 5th Green
Growth Knowledge Platform Annual Conference, November 20, 2017.

"Energy Use in the Developing World: Perspectives from Kenya and India," Keynote Address at
Williams College Center for Development Economics 2017 Conference, April 13, 2017,
Williamstown, MA.

“Carbon Mitigation Strategies: What Can We Do?” Keynote Address at Spanish Association for Energy Economics (AEEE), February 2-3, 2017, Salamanca, Spain.

“Effective Carbon Mitigation Strategies,” Keynote Address to the Association for Environmental and Resource Economists, June 11, 2016, Breckenridge, CO.

“Energy Access and Energy Use in the Developing World,” Keynote Address to the Mannheim Energy Conference on Sustainable Energy Markets, May 8, 2015, University of Mannheim

“Policies to Address Climate Change: Opportunities and Challenges,” State-of-the-Art Lecture to the Canadian Economics Association, June 7, 2008, University of British Columbia

Conferences

Conference co-organizer (with Spencer Banzhaf), National Bureau of Economic Research Energy and Environmental Economics Program Meeting, February 27-28, 2020

Conference co-organizer (with Chris Timmins), National Bureau of Economic Research Energy and Environmental Economics Summer Institute Meeting, July 24-25, 2017

Program Committee, Association for Environmental and Resource Economists, Summer Conference, June 3-5, 2015

Conference co-organizer (with Chris Costello), National Bureau of Economic Research Energy and Environmental Economics Program Meeting, January 23-24, 2014

Program Committee, American Economic Association, Annual Meeting, January 3-5, 2014

Program Committee, Association for Environmental and Resource Economists, Summer Conference, June 6-8, 2013

Program Committee, Association for Environmental and Resource Economists, Summer Conference, June 3-5, 2012

Conference co-organizer (with Scott Taylor), National Bureau of Economic Research Energy and Environmental Economics Summer Institute Meeting, July 29-30, 2011

Program Committee, Association for Environmental and Resource Economists, Inaugural Summer Conference, June 9-10, 2011

Program Committee, World Congress of Environmental and Resource Economists, June 28-July 2, 2010

Co-organizer (with Don Fullerton), “The Design and Implementation of U.S. Climate Policy,” National Press Club, May 13-14, 2010

Conference co-organizer (with Matt Kotchen), National Bureau of Economic Research Energy and Environmental Economics Summer Institute Meeting, July 20-21, 2009

Conference co-organizer (with Erin Mansur), National Bureau of Economic Research Energy and Environmental Economics Program Meeting, February 8, 2008

Conference co-organizer (with Florian Zettelmeyer), National Bureau of Economic Research Industrial Organization Program Meeting, February 2-3, 2007

Program Committee (Empirical Industrial Organization), Econometric Society North American Winter Meeting, January 6-8, 2006

Program Committee, International Industrial Organization Conference, 2004, 2005, 2007

Program Committee (Applied Microeconomics), Econometric Society North American Summer Meeting, June 26-29, 2003

Conference co-organizer (with Frank Wolak), National Bureau of Economic Research Industrial Organization Program Meeting, January 25-26, 2002

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