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Professional Experience:

2009–Present, Visiting Fellow, Resources for the Future, Washington, DC

1987–2008, Chief, Natural Resources, Energy, and Agriculture Branch, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC

1981–1987, Economist, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC

1977–1981, Senior Economist, Government Programs and Regulations, Council on Wage and Price Stability, Executive Office of the President, Washington, DC

1976–1977, Economist, Subcommittee on Antitrust and Monopoly, United States Senate, Washington, DC

1973–1976, Assistant Professor, Department of Economics, U.S. Naval Academy, Annapolis, Maryland

1969–1973, Economist, Financial Structure Section, Board of Governors of the Federal Reserve System, Washington, DC

Advisory Panels:

Member, Committee on Reducing the Threat of Improvised Explosive device Attacks by Restricting Access to Explosive Chemicals, National Academies of Science, Engineering, Medicine, 2017.

Member, U.S. Environmental Protection Agency Science Advisory Board Review of the EPA's Revised Guidelines for Preparing Economic Analysis, 2020.

Publications:

"The Economics of Regulatory Repeal", with Alan J. Krupnick and Justine Huetteman, Review of Environmental Economics and Policy, 2021, 15(1).

"Looking Back at 50 Years of the Clean Air Act", with [Joseph Aldy](#), [Maximilian Auffhammer](#), [Maureen Cropper](#), & [Richard Morgenstern](#), *Journal of Economic Literature*, forthcoming.

"Measuring Energy Efficiency: Accounting for the Hidden Costs of Product Failure", with Sofie Miller, *Economics of Energy & Environmental Policy*, 2020, 9(2)

DOI: [10.5547/2160-5890.9.2.afra](https://doi.org/10.5547/2160-5890.9.2.afra)

"The energy paradox in seemingly competitive industries: The use of energy-efficient equipment on heavy-duty tractor trailers", with Randall Lutter and Derek Wietelman, *Energy Policy* 129 (2019), 467-480.

"Restrospective Analyses Are Hard: A Cautionary Tale", with Alex Egorenkov, *Journal of Benefit-Cost Analysis* 2018, 9(2), 247 – 284.

"Looking Backward to Move Regulations Forward", with Maureen Cropper and Dick Morgenstern, *Science*, 1375-1376, March 2017.

"EPA's New Source Review Program: Time for Reform?", with John Graham and Jeff Homstead, *Environmental Law Reporter*, 10026-10040, January 2017.

"How Effective Are Federally Mandated Information Disclosures?" with Randall Lutter, *Journal of Benefit-Cost Analysis*, 326-349, August 2016.

"Uncertain Benefits Estimates for Reductions in Fine Particle Concentrations," with Randall Lutter, *Risk Analysis*, an International Journal, August 2012.

"Efficient Pollution Regulation: Getting the Prices Right: Comment," with Randall Lutter, *American Economic Review*, 102(1): 602-07, 2012.
doi:10.1257/aer.102.1.602.

"Tradable Standards for Clean Air Act Carbon Policy," with Dallas Burtraw and Nathan Richardson, *Environmental Law Reporter*, 41: 10098-120. Related RFF Discussion Paper 12-05.

"The Challenges of Improving the Economic Analysis of Pending Regulations: The Experience of OMB Circular A-4," with Randall Lutter, *Annual Review of Resource Economics* 3: 71-85, 2011, doi: 10.1146/annurev-resource-083110-120042.

"Do Some NOx Emissions Have Negative Environmental Damages? Evidence and Implications for Policy," with Randall Lutter, *Environmental Science and*

Technology 45(17): September 2011,
<http://pubs.acs.org/doi/abs/10.1021/es202622z>.

"The Treatment of Uncertainty in EPA's Analysis of Air Pollution Rules: A Status Report." J. Benefit-Cost Anal. 2(2): Artic. 6,
<http://www.bepress.com/jbca/vol2/iss2/6>.

"Greenhouse Gas Regulation under the Clean Air Act: A Guide for Economists," with Dallas Burtraw and Nathan Richardson, Review of Energy Economics and Policy 5: 293,
2011, <http://reep.oxfordjournals.org/content/5/2/293.abstract>

Banking on Allowances: The EPA's Mixed Record in Managing Emissions-Market Transitions, with Nathan Richardson, RFF Discussion Paper 10-42, NYU Journal of Environmental Law, 2011.

"The Challenges of Improving the Economic Analysis of Pending Regulations: The Experience of OMB Circular A-4," with Randall Lutter, Annual Review of Resource Economics 3: 20.1-20.15, 2011.
<http://arjournals.annualreviews.org/eprint/4dqTTZ6QA4w2BwhTSRRJ/full/10.1146/annurev-resource-083110-120042>.

"Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway," with Nathan Richardson and Dallas Burtraw, Environmental Law Reporter 41: 10098-120, 2011.

"The Future of Regulatory Oversight and Analysis," with Susan Dudley, RFF Weekly Policy Commentary, June 8, 2009.

"Conflicting Goals: Energy Security versus GHG Reductions under the EISA Cellulosic Ethanol Mandate," with Rob Johansson, RFF Discussion Paper 09-24, 2009.

"Abandonment of Residential Housing and the Abatement of Lead-Based Paint Hazards," with Randall Lutter, Journal of Policy Analysis and Management 15(Summer): 424-29, 1996.

"The US Regulatory Analysis Framework: A Review," with Ralph A. Luken, Oxford Review of Economic Policy 9(4): 96-111, 1993.

"The Role of Economic Analysis in Shaping Environmental Policy," Law and Contemporary Problems 54(4): 113-25, 1991.

"Alternative Fuels for Pollution Control: An Empirical Evaluation of Benefits and Costs," with Albert McGartland, *Journal of Contemporary Policy Issues* 8(January), 62–74, 1990.

"Economic Objectives within a Bureaucratic Decision Process: Setting Pollution Control Requirements Under the Clean Water Act," with Vince Munley, *Journal of Environmental Economics and Management* 17(July), 35–53, 1989.

"Benefit-Cost Analysis for Environmental Regulation," in *Environmental Policy under Reagan's Executive Order: The Role of Benefit-Coat Analysis*, edited by V. Kerry Smith, University of North Carolina Press, 1984.

"Municipal Wastewater Treatment Cost," with Vince Munley, *Journal of Environmental Economics and Management* 11(March), 28–38, 1984.

"The Microeconomics of the Supply of Money," with George Grantham and Tom Velk, *Oxford Economic Papers* 29(November), 339–56, 1977.

"Market Structure and Price Collusion: An Empirical Approach," with Doug Greer, *Journal of Industrial Economics* 26(September), 21–44, 1977.

The Performance of Individual Bank Holding Companies, Staff Economic Studies (84), Board of Governors of the Federal Reserve System, Washington, DC, 1975.

"The Second Bank of the United States: An Instrument for an Interregional Monetary Union," *Journal of Economic History* 34: 447–67, 1974.

Awards

IAEE, 2020, Best Paper covering the period 2017-2020, *Economics of Energy & Environmental Policy*

Presidential Rank Award, Distinguished Senior Professional, 2005

Presidential Rank Award, Meritorious Senior Professional, 2001

Education

BS, Engineering Physics, Cornell University, Ithaca, NY, 1965

PhD, Economics, University of California, Berkeley, 1972

Dissertation: *The Impact of the Policies of the Second Bank of the United States on the Economy of the Ohio Valley: 1814–1829*