

June 2008

Resume of: **Dallas Burtraw**

Education:

Ph.D., Economics, University of Michigan, 1989.

M.P.P., Public Policy, University of Michigan, 1986.

B.S., Community Economic Development, University of California, Davis, 1980.

Areas of Specialization:

Environmental Policy, Public Finance, Industrial Organization, Applied Game Theory.

Professional Activities:

Senior Fellow, Resources for the Future, Quality of the Environment Division. (1998-present)

Fellow, Resources for the Future, Quality of the Environment Division. (1989-1998)

Consultant to state and federal agencies, electricity companies, environmental organizations and international lending and economic assistance institutions.

Previous Experience:

Professional Lecturer in International Relations, Energy, Environment, Science and Technology. Johns Hopkins SAIS University. (1993-1999).

Adjunct Professor, Department of Economics, Georgetown University. (1998).

Instructor, University of Michigan: Introductory Microeconomics.

Teaching Assistant, University of Michigan: Operations Research.

Teaching Assistant, University of Michigan: Law and Economics. (1984-1989).

Economic Analyst, Pacific Gas and Electric Company. (1984)

Program Manager, SolarCal Local Government Commission on Conservation and Renewable Resources, State of California. (1981-1982).

PUBLICATIONS

“Tradable Permit Markets and Experimental Economics: Discussion,” 2008, in *Environmental Economics, Experimental Methods*, Todd Cherry, Steven Kroll and Jason F. Shogren eds, New York: Routledge.

“Climate Change Primer: Cap and Trade,” 2008, *Energy Law Journal*, (with Bill Westerfield, Brian McLean, Franz Litz and Jeff King). 29(1): 173-193.

“Tradable Rights to Emit Air Pollution” 2008, *Australian Journal of Agricultural and Resource Economics*, (with David Evans). forthcoming. See also Related RFF Discussion Paper 08-08.

“Regulating CO₂ in Electricity Markets: Sources or Consumers?” *Climate Policy*, forthcoming. See Related RFF Discussion Paper 07-49.

“Local Options on Global Stocks: How the States are affecting the U.S. Debate on Climate Policy,” 2007, (with Bill Shobe) in *States and Climate Change*, Policy Research Institute for the Region at Princeton University, Conference Proceedings.

“Cap and Trade Policy to Achieve Greenhouse Gas Emission Targets,” 2007, In *Growing the Economy Through Global Warming Solutions*, Newton, MA: Civil Society Institute.

“Economic and Energy Impacts from Participation in the Regional Greenhouse Gas Initiative: A Case Study of the State of Maryland,” 2008 *Energy Policy* (with Matthias Ruth, Steven Gabriel, Karen Palmer, Anthony Paul, Yihsu Chen, Benjamin Hobbs, Daraius Irani, Jeffrey Michael, Kim Ross, Russell Conklin, Julia Miller), vol. 36: 2279-2289.

“Simple Rules for Targeting CO₂ Allowance Allocations to Compensate Firms,” 2007, *Climate Policy*, (with Karen Palmer and Danny Kahn). 6:477-493. See also RFF Discussion Paper 06-28 (May).

“A Ten-Year Rule to Guide the Allocation of EU Emission Allowances,” 2007, *Energy Policy*, (with Markus Åhman, Joseph Kruger, and Lars Zetterberg). 35 (3):1718-1730.

“Modeling Economy-wide vs. Sectoral Climate Policies Using Combined Aggregate-Sectoral Models,” 2006, *The Energy Journal*, (with William Pizer, Winston Harrington, Richard Newell, and James Sanchirico). 27(3), 135-168. See also: RFF Discussion Paper 05-08 (April).

“The Benefits and Costs of Reducing Emissions from the Electricity Sector,” 2006, *Journal of Environmental Management*, (with Karen Palmer and Jhih-Shyang Shih). forthcoming.

“Valuation of Natural Resource Improvements in the Adirondacks,” 2006, *Land Economics*, (with Spencer Banzhaf, David Evans, and Alan Krupnick). Vol. 82, No. 3, 445-464 (August). See also RFF Report, September 2004.

“CO₂ Allowance Allocation in the Regional Greenhouse Gas Initiative and the Effect on Electricity Investors,” 2006, *The Electricity Journal*, (with Danny Kahn and Karen Palmer). 19 (2): 79-90 (March). See also RFF Discussion Paper 05-55.

“Forever Wild, But Do We Care? How New Yorkers Value Natural Resource Improvement,” 2005, (H. Spencer Banzhaf, David Evans, and Alan J. Krupnick), *Resources* Issue 158.

“Cost-Effectiveness of Renewable Electricity Policies,” 2005, *Energy Economics*, (with Karen Palmer). 27: 873-894. See also RFF Report 2004.

“The Environmental Impacts of Electricity Restructuring: Looking Back and Looking Forward,” 2005, *Environment & Energy Law & Policy Journal*, (with Karen Palmer). 1(1): 171-219. See also RFF Discussion Paper 05-07.

“Economics of Pollution Trading for SO₂ and NO_x,” 2005, *Annual Review of Environment and Resources*, (with David A. Evans, Alan Krupnick, Karen Palmer, and Russell Toth). Vol. 30, 352-290. See also RFF Discussion Paper 05-05 (January).

“A Carbon Tax to Reduce the Deficit,” 2004, in *New Approaches on Energy and the Environment: Policy Advice for the President*, (with Paul R. Portney). Richard D. Morgenstern and Paul R. Portney, eds., RFF Press., Chapter 3

“Cleaning Up Power Plant Emissions,” 2004, in *New Approaches on Energy and the Environment: Policy Advice for the President*, (with Karen L. Palmer). Richard D. Morgenstern and Paul R. Portney, eds., RFF Press., Chapter 8

“Efficient Emission Fees in the U.S. Electricity Sector,” 2004, *Resource and Energy Economics*, (with Spencer Banzhaf and Karen Palmer). Vol. 26, No. 3 (September) 317-341. See also: RFF Discussion Paper 02-45.

Air Quality Management in the United States, National Research Council, 2004. Washington DC: The National Academies Press, (January). Significant writing and editing role.

“NO_x Emissions in the United States: A Potpourri of Policies,” 2004, *Choosing Environmental Policy*, (with David A. Evans). W. Harrington, R. D. Morgenstern and T. Sterner (eds.) Washington DC: Resources for the Future.

“The SO₂ Cap-and-Trade Program in the United States: A “Living Legend” of Market Effectiveness,” 2004, in *Choosing Environmental Policy*. (with Karen Palmer). W. Harrington, R. D. Morgenstern and T. Sterner (eds.) Washington DC: Resources for the Future.

“Emission Trading and Allowance Distribution,” 2003, *Second Generation Issues Committee Newsletter*, American Bar Association, Vol. 3, No. 2.

“Economic Benefits of Controls,” 2003, in *Acid Rain: Are the Problems Solved?* Ed: James C. White. Bethesda, MD: American Fisheries Society (February).

“Trading Cases: Is Trading Credits in Created Markets a Better Way to Reduce Pollution and Protect Natural Resources?” 2003, *Environmental Science and Technology*, (with James Boyd, Alan Krupnick, Virginia McConnell, Richard G. Newell, Karen Palmer, James N. Sanchirico and Margaret Walls). Vol. 37, No. 11 (June 1) pp. 216-223.

“Uncertainty and the Net Benefits of NO_x Emissions Reductions from Electricity Generation,” 2003, *Land Economics*, (with Ranjit Bharvirkar and Meghan McGuinness). Vol. 79, No. 3, 382-401. See also: Resources for the Future Discussion Paper 02-01 (January).

“Ancillary Benefits of Reduced Air Pollution in the United States from Moderate Greenhouse Gas Mitigation Policies in the Electricity Sector,” 2003, *Journal of Environmental Economics and Management*, (with Alan Krupnick, Karen Palmer, Anthony Paul, Mike Toman and Cary Bloyd). Vol. 45, No. 3 (May) 650-673. See also: Resources for the Future Discussion Paper 01-61 (December); replaces Resources for the Future Discussion Paper 99-51.

“Clean Air for Less: Exploiting Tradeoffs Between Different Air Pollutants,” 2002, *Fordham Environmental Law Journal*, (with Randall Lutter). Vol. 13, 555-582. See also: AEI-Brookings Joint Center for Regulatory Studies, Regulatory Analysis 03-4 (March 2003).

“Capping Emissions: How Low Should We Go?” 2002, *Public Utilities Fortnightly*, (with Karen Palmer and Spencer Banzhaf). Vol. 140, No. 22 (December) pp. 28-36.

“Proposed Regulation of Multiple Pollutants in Electricity Sector is Historic: But Is It Sensible?” 2002, *Resources*, Vol. 148, (Summer) 2-5.

“Designing the Right Multi-Pollutant Plan,” 2002, *The Environmental Forum*, Vol. 19, No. 3 (May/June) pp. 52-53.

“The Effect on Asset Values of the Allocation of Carbon Dioxide Emission Allowances,” 2002, *The Electricity Journal*, (with Karen Palmer, Anthony Paul and Ranjit Bharvirkar). Vol. 15, No. 5, 51-62. See also: RFF Discussion Paper 02-15 (March).

“Three Pollutants and An Emission: A Playbill for the Multipollutant Legislative Debate,” 2002, *Brookings Review*, Vol. 20, No. 2 (Spring) 14-17, 48.

“Cost-Effective Reduction of NO_x Emissions from Electricity Generation,” 2001, *Journal of Air & Waste Management*, (with Karen Palmer, Ranjit Bharvirkar, and Anthony Paul). Vol. 51, 1476-1489. See also: Resources for the Future Discussion Paper 00-55 (December).

“Carbon Emission Trading Costs and Allowance Allocations: Evaluating the Options,” 2001, *Resources*, Issue 145 (Fall) pp. 13-16.

“‘Ancillary Benefits’ of Greenhouse Gas Mitigation Policies,” (with Michael A. Toman) 2001, in *Climate Change Economics and Policy*, ed: Michael A. Toman, Resources for the Future.

“Electricity Restructuring: Consequences and Opportunities for the Environment,” 2001, *International Yearbook of Environmental and Resource Economics*, (with Karen Palmer and Martin Heintzelman). Volume V, pp. 40-89. H. Folmer and T. Tietenberg (eds.) Northampton, Mass: Edward Elgar. See also: Resources for the Future Discussion Paper 00-39 (September).

“SO₂ Control by Electric Utilities: What are the Gains from Trade?” 2000, *Journal of Political Economy*, (with Curtis Carlson, Maureen Cropper and Karen Palmer). Vol. 108, No. 6, 1292-1326. See also: Resources for the Future Discussion Paper 98-44-REV (July).

“The Ancillary Benefits and Costs of Climate Change Mitigation: A Conceptual Framework,” 2000, *Ancillary Benefits and Costs of Greenhouse Gas Mitigation*, (with Alan Krupnick and Anil Markandya). Organization for Economic Cooperation and Development, Conference Proceedings, March 27-29, Washington DC.

“Estimating the Ancillary Benefits of Greenhouse Gas Mitigation Policies in the US,” 2000, *Ancillary Benefits and Costs of Greenhouse Gas Mitigation*, (with Michael A Toman). Organization for Economic Cooperation and Development, Conference Proceedings, March 27-29, Washington DC.

“Innovation Under the Tradable Sulfur Dioxide Emission Permits Programme in the U.S. Electricity Sector,” 2000, *Innovation and the Environment*, Proceedings from OECD Workshop, June 19, 2000. See also: Resources for the Future Discussion Paper 00-38 (September).

“Appraisal of the SO₂ Cap-and-Trade Market,” 2000, in *Emissions Trading: Environmental Policy’s New Approach*, (Richard F. Kosobud, ed.). New York: John Wiley & Sons.

“Renewables from Another Angle,” 2000, *Electric Perspectives*, (with James McVeigh, Joel Darmstadter, and Karen Palmer). Vol. 25, No. 2, 10-20. See: “Winner, Loser, or Innocent Victim: Has Renewable Energy Performed As Expected?”

“Winner, Loser, or Innocent Victim: Has Renewable Energy Performed As Expected?” 2000, *Solar Energy*, (with James McVeigh, Joel Darmstadter, and Karen Palmer). Vol. 68, No. 3, 237-255. Published also as Renewable Energy Policy Project Research Report No. 7, and Resources for the Future Discussion Paper 99-28 (March 1999).

“Green Taxes and Administrative Costs: Comment.” 2001, *Behavioral and Distributional Effects of Environmental Policy*, (eds: Carlo Carraro and Gilbert E. Metcalf). University of Chicago Press.

"The Environmental Effects of SO₂ Trading and Banking," 1999, *Environmental Science and Technology*, (with Erin Mansur). Vol. 33, No. 20, (October 15) pp. 3489-3494.

"The Cost-Effectiveness of Alternative Instruments For Environmental Protection in a Second-Best Setting," 1999, *Journal of Public Economics*, (with Lawrence H. Goulder, Ian W. H. Parry, and Roberton C. Williams III). Vol. 72, No. 3 (June) pp. 329-360.

"Cost Savings, Market Performance and Economic Benefits of the U.S. Acid Rain Program," 1999, in *Pollution for Sale: Emissions Trading and Joint Implementation*, Steve Sorrell and Jim Skea (eds.) Edward Elgar Publishing.

"Renewable Energy: Winner, Loser, or Innocent Victim?" 1999, (with Joel Darmstadter, Karen L. Palmer, and James McVeigh). *Resources* Issue 135.

"Measuring the Value of Health Improvements from Clean-up in the Great Lakes Region," 2001, in *Great Lakes Economic Valuation Guidebook*, (with Alan J. Krupnick). Allegra Cangelosi (ed.) National Oceanic and Atmospheric Administration and Northeast-Midwest Institute.

"Assessing the Impact of Electricity Restructuring on the Environment in Maryland," 1998, *EM*, (with Diane Brown, Matt Kahal, Dallas Burtraw, Julie Ross and Mark Garrison). (August).

"The Costs and Benefits of Reducing Air Pollutants Related to Acid Rain," 1998, *Contemporary Economic Policy*, (with Alan J. Krupnick, Erin Mansur, David Austin and Deirdre Farrell). Vol. 16 (October) pp. 379-400.

"Improving Efficiency in Bilateral Emission Trading," 1998, *Environmental and Resource Economics*, (with Ken Harrison and Paul Turner). Vol. 11, No. 1, pp. 19-33.

"Revenue-Raising vs. Other Approaches to Environmental Protection: The Critical Significance of Pre-Existing Tax Distortions," 1997, *RAND Journal of Economics*, (With Lawrence H. Goulder and Ian W. H. Parry). Vol. 28, No. 4, (Winter) pp. 708-731.

"The Social Costs of Electricity: Do the Numbers Add Up?" 1997, *Resources and Energy*, (with Alan J. Krupnick). Vol. 18, No. 4 (December) pp. 423-466.

"The Second-Best Use of Social Cost Estimates," 1997, *Resources and Energy*, (with Alan J. Krupnick). Vol. 18, No. 4 (December) pp. 467-490.

"SO₂ Allowance Trading: How Do Expectations and Experience Measure Up?" 1997, *The Electricity Journal*, (with Douglas R. Bohi). Vol. 10, No. 7 (August/September) pp. 67-75.

"Second-Best' Adjustments to Externality Estimates in Electricity Planning with Competition," 1997, *Land Economics*, (with Karen L. Palmer and Alan J. Krupnick). Vol. 73, No. 2, (May) pp. 224-239.

"Electricity Restructuring and Regional Air Pollution" 1997, *Resources and Energy*, (with Karen L. Palmer). Vol 19, Nos.1-2, (March) pp. 139-174.

"Evaluation of Sulfur Dioxide Emission Allowance Trading," 1997, in *Market Tools for Green Goals*, (with Douglas R. Bohi). Peter Alonzi and Richard F. Kosobud (eds.) Conference Proceedings, Sponsored by Chicago Board of Trade.

"Economic Benefits of Emissions Reductions," (with David Austin and Alan J. Krupnick) 1997, in *NAPAP's 1996 Integrated Assessment — Report to Congress*.

"Design and Performance of Pollution Trading Programs," (with Brian Kropp) 1997, in *NAPAP's 1996 Integrated Assessment — Report to Congress*.

"Experience with Allowance Trading: Performance to Date and Lessons for Regulatory Policy," (with Douglas R. Bohi) 1997, Proceedings of the Specialty Conference of the Air & Waste Management Association, *Acid Rain & Electric Utilities II*, January 21, 1997.

Tracking and Analysis Framework (TAF) Model Documentation and User's Guide, (with Cary Bloyd et al.) 1996, Published by Argonne National Laboratory, ANL/DIS/TM-36 (December).

A New Standard of Performance: An Analysis of the Clean Air Act's Acid Rain Program," 1996, *Environmental Law Reporter*, (with Byron Swift). 26 (8) (August) 10411-10423.

"The Acid Rain Success Story," 1996, *The Environmental Forum*, Vol. 13, No. 3 (May/June) pp. 31-32.

"The Environmental Effects of Restructuring" 1996, in *A Shock to the System: Restructuring America's Electricity Industry*, (with Alan J. Krupnick). Resources for the Future, Washington, DC

Review of: *Sustaining Coastal Resources: Economics and the Natural Sciences*, Charles S. Colgan, ed. (1995) in *Coastal Management* 24 (3) (July-September, 1996) pp. 271-276.

"Air Quality and Electricity" 1996, (with Alan J. Krupnick and Karen L. Palmer). *Resources* 123 (Spring) 6-8.

"The SO₂ Emissions Trading Program: Cost Savings Without Allowance Trades," 1996, *Contemporary Economic Policy*, Vol. XIV (April) pp. 79-94.

"Call It 'Pollution Rights,' But It Works," 1996, *The Washington Post*, March 31.

"Trading Emissions to Clean the Air: Exchanges Few but Savings Many," 1996, *Resources* 122 (Winter) 3-6. Reprinted with revisions in: *UK CEED Bulletin*, UK Centre for Economic and Environmental Development, No. 48 (Autumn, 1996) pp. 24-26.

"Optimal Adders for Environmental Damage by Public Utilities" (with Winston Harrington, A. Myrick Freeman III, and Alan J. Krupnick) *Journal of Environmental Economics and Management*, Vol. 29, No. 2, S1-S19, 1995.

Estimating Externalities of Electricity Fuel Cycles (with Alan J. Krupnick, Russell Lee, et al.; Oak Ridge National Laboratories/Resources for the Future) 1994-1996, seven volumes, McGraw-Hill/Utility Data Institute, Washington, DC.

"Agency in International Permit Trading," 1994, in F. Førsund and G. Klaassen, eds., *Economic Instruments For Air Pollution Control*, Kluwer Academic Publishers.

"Tradable Sulfur Dioxide Emission Permits and European Economic Integration," in Michael A. Toman, ed., *Pollution Abatement Strategies in Central and Eastern Europe*, Resources for the Future, Washington, DC, 1994, pp. 49-59.

"Economic Conservation," in R. Eblen and W. Eblen, eds., *The Encyclopedia of the Environment*, Houghton Mifflin Company, Boston, MA, 1994.

"The Social Costing Debate: Issues and Resolutions" (with Alan J. Krupnick, A. Myrick Freeman III, and Winston Harrington) in O. Hohmeyer and R. Ottinger, eds., *Social Costs of Energy*, Springer-Verlag, Berlin, 1994.

"Bargaining with Noisy Delegation," *RAND Journal of Economics*, Vol. 24, No. 2 (Spring 1993) pp. 40-57.

"Weighing Environmental Externalities: How to Do It Right" (with A Myrick Freeman III, Winston Harrington and Alan J. Krupnick) *The Electricity Journal*, August/September 1992, pp. 22-29.

"Equity and International Agreements For CO₂ Containment" (with Michael A. Toman) *Journal of Energy Engineering*, Vol. 118, No. 2 (August 1992) pp. 122-135.

"The Social Costs of Electricity: How Much of The Camel To Let Into the Tent?" (with Alan J. Krupnick) *Regulatory Responses to Continuously Changing Industry Structures*, Proceedings of The Institute of Public Utilities Twenty-Third Annual Conference, Charles G. Stalon, ed., East Lansing, Mich., Institute of Public Utilities, Michigan State University, 1992. Also presented at the 85th Annual Meeting and Exhibition of the Air and Waste Management Association, Kansas City, KS, June 21-26, 1992, 92-135.03. (Resources for the Future Discussion Paper QE92-15, April 1992.)

"Utility Investment Behavior and the Emission Trading Market" (with Douglas R. Bohi) *Resources and Energy*, Vol. 14, Nos. 1/2 (April 1992) pp. 129-156.

"Strategic Delegation in Bargaining," *Economic Letters*, Vol. 38, No. 2 (February 1992) pp. 181-185.

"The Social Costs of Electricity" (with Alan J. Krupnick) *Public Power*, Vol. 50, No. 3 (May-June 1992) p. 56.

"Avoiding Regulatory Gridlock in the Acid Rain Program" (with Douglas R. Bohi) *Journal of Policy Analysis and Management*, Vol. 10, No. 4 (Fall 1991) pp. 676-684.

"Compensating Losers When Cost-Effective Environmental Policies Are Adopted," *Resources*, No. 104 (Summer 1991) Resources for the Future, Washington, DC, pp. 1-5.

"Resolving Equity Issues in Greenhouse Gas Negotiations" (with Michael A. Toman) *Resources*, No. 103 (Spring 1991) Resources for the Future, Washington, DC, pp. 10-13.

"Compensation Issues for Incentive-Based Regulation" (with Paul R. Portney) in Robert N. Stavins, ed., *Project 88-Round II - Incentives for Action: Implementing Market-Based Environmental Policies*, May 1991.

"Environmental Policy In The United States" (with Paul R. Portney) in Dieter Helm, ed., *Economic Policy Towards the Environment*, Oxford, Eng., Blackwell Publishers, 1991.

"Regulatory Aspects of Emissions Trading: Conflicts Between Economic and Environmental Goals" (with Douglas R. Bohi) *The Electricity Journal*, December 1990, pp. 47-55.

"Emissions Trading in the Electric Utility Industry" (with Douglas R. Bohi and Alan J. Krupnick) *Resources*, No. 100 (Summer 1990) Resources for the Future, Washington, DC, pp. 10-13.

"Evaluation of Inclusionary Housing Programs: Four Case Studies" (with S. Schwartz and R. Johnston) *Public Affairs Report*, Vol. 23, No. 3 (June 1982) Institute of Governmental Studies, University of California, Berkeley.

BOOK REVIEWS, LETTERS and TESTIMONY

Testimony before the U.S. House of Representatives Committee on Energy and Commerce Subcommittee on Energy and Air Quality, "Climate Change: Lessons Learned from Existing Cap and Trade Programs," March 29, 2007.

Review of: *The Economics of Energy Efficiency*, Steve Sorrell et al. (2004) in *Journal of Economics Literature*,

2006 (March), forthcoming.

Review of: *Markets for Clean Air*, A. Denny Ellerman et al. (2000) in *Regional Science and Urban Economics*, 2001. Vol. 32, Issue 1 (January) pp. 139-144.

Testimony before the Senate Energy and Water Development Appropriations Subcommittee on “The Performance of Renewables,” September 14, 1999.

Review of: *Acid Rain and Environmental Degradation*, Ger Klaassen (1996) in *Journal of Economic Literature*, 1998.

“A Poor Measure of Success: Reply,” (with Douglas R. Bohi) Letter to the Editor, *The Electricity Journal*, 1997 (Vol. 10, No. 9) reply to Elizabeth M. Bailey, pp. 6-7.

Review of: *Sustaining Coastal Resources: Economics and the Natural Sciences*, Charles S. Colgan, ed. (1995) in *Coastal Management* 24 (3) (July-September, 1996) pp. 271-276.

“Rumors of the Demise of RECLAIM ‘Greatly Exaggerated,’” (with Alan J. Krupnick) Letter to the Editor, *Regulation*, 1994 (No. 4);

Comment on “Pollution Trading in La La Land,” by James L. Johnston, 1994 (No. 3).

WORKING PAPERS and REPORTS

“An Update on the Science of Acidification in the Adirondack Park,” 2008, (with Anna Mische John, David A. Evans, H. Spencer Banzhaf, Alan J. Krupnick, and Juha V. Siikamäki), RFF Discussion Paper 08-11 (May).

Auction Design for Selling CO₂ Emission Allowances under the Regional Greenhouse Gas Initiative – Addendum, 2008, (with Charles Holt, William Shobe, Karen L. Palmer, Jacob Goeree, and Erica Myers), Resources for the Future Report (April).

Auction Design for Selling CO₂ Emission Allowances under the Regional Greenhouse Gas Initiative, 2007, (with Jacob Goeree, Charles Holt, Karen L. Palmer, and William Shobe), Resources for the Future Report, (October); Report to the New York State Energy Research and Development Authority.

Assessing U.S. Climate Policy Options, 2007, (with Raymond J. Kopp, William A. Pizer, Daniel Hall, Richard D. Morgenstern, Juha V. Siikamäki, Joseph E. Aldy, Ian W.H. Parry, Karen L. Palmer, Mun Ho, Evan M Herrstadt, and Joseph Maher). Resources for the Future Report (November).

“The Architecture of Emission Allowance Markets and Incentives for Investment in Electricity,” 2007, (with Karen Palmer, Dallas Burtraw). Incentives to Build New Generation on Competitive Electricity Markets: Market Design Elforsk. See www.marketdesign.se.

Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California, 2007, Recommendations of the Market Advisory Committee to the California Air Resources Board, (June 20), Contributing Author.

“Dynamic Adjustments to Incentive Regulation to Improve Efficiency and Performance,” 2007. (with Karen Palmer and Danny Kahn). Resources for the Future Discussion Paper; Presented at Market Mechanisms and Incentives: Applications to Environmental Policy | EPA | Washington DC | October 17, 2006

“Compensation Rules for Climate Policy in the Electricity Sector,” 2007, (with Karen Palmer). Resources for the Future Discussion Paper 07-41.

“U.S. Climate Policies”, 2007, (with Toshi Arimura, Karen Palmer, and Alan Krupnick), Mizuho Bank Group for METI, Japan (March 15).

Economic and Energy Impacts from Maryland's Potential Participation in the Regional Greenhouse Gas Initiative, 2007, (with Anthony Paul, Mathius Ruth, Steve Gabriel, Kim Ross, Ben Hobbs, Yihsu Chen, Daraius Irani, Jeffrey Michael). Maryland Department of Environment (January 31).

“Simple Rules for Targeting CO₂ Allowance Allocations to Compensate Firms,” 2006 (with Karen Palmer and Danny Kahn). RFF Discussion Paper 06-28 (May).

Not a Sure Thing: Making Regulatory Choices Under Uncertainty, 2006, (with Alan Krupnick, Richard Morgenstern, Michael Batz, Peter Nelson, Jhih-Shyang Shih, and Michael McWilliams). Resources for the Future Report (February).

“Recommendations for the Design of Modeling and Analysis of the Electricity Sector to Guide Options for Climate Policy in California,” 2006, in *Managing Greenhouse Gas Emissions In California*, (Chapter 9 with Matthias Fripp, Steve Moss and Richard McCann). W. Michael Hanemann and Alexander E. Farrell, eds. U.C. Berkeley: The California Climate Change Center (January).

“Valuation of Air Emissions from Livestock Operations and Options for Policy” 2006, (with Shih, Jhih-Shyang, Karen Palmer and Juha Siikamäki). Proceedings of Workshop on Agricultural Air Quality: State of the Science, June 5-8. Potomac, Maryland. Ed. Viney P. Aneja, William H. Schlesinger, Raymond Knighton, Greg Jennings, Dev Niyogi, Wendell Gilliam, and Clifford S. Duke. Raleigh: North Carolina State University.

“Air Emissions of Ammonia and Methane from Livestock Operations: Valuation and Policy Options,” 2006, (with Karen Palmer, Jhih-Shyang Shih, Juha Siikamäki). Proceedings, *Workshop on Agricultural Air Quality*, Ecological Society, Washington DC (June 8). RFF Discussion Paper 06-11.

“Lessons for a cap-and-trade program,” 2006, in *Managing Greenhouse Gas Emissions In California*, (Chapter 5, with Alexander E. Farrell, Lawrence H. Goulder and Carla Peterman). W. Michael Hanemann and Alexander E. Farrell, eds. U.C. Berkeley: The California Climate Change Center (January).

“Summary Communication: Reducing Emissions from the Electricity Sector: The Costs and Benefits Nationwide and in the Empire State,” 2005, (with Karen Palmer and Jhih-Shyang Shih). New York State Energy Research and Development Authority (October).

“The Impact of Long-Term Generation Contracts on Valuation of Electricity Generating Assets Under the Regional Greenhouse Gas Initiative” 2005, (with Nathan Wilson and Karen Palmer). RFF Discussion Paper 05-37 (August).

“Allocation of CO₂ Emission Allowances in the Regional Greenhouse Gas Cap-and-Trade Program,” 2005, (with Karen Palmer and Danny Kahn). RFF Discussion Paper 05-25 (June).

“Economics of Pollution Trading for SO₂ and NO_x,” 2005, (with David A. Evans, Alan J. Krupnick, Karen L. Palmer, and Russell Toth). RFF Discussion Paper 05-05 (March).

“Reducing Emissions from the Electricity Sector: The Costs and Benefits Nationwide and in the Empire State,” 2005, (with Karen Palmer and Jhih-Shyang Shih). RFF Discussion Paper 05-23 (May). Also published by the New York State Energy Research and Development Authority, Report 05-02.

Valuation of Natural Resource Improvements in the Adirondacks, 2004, (with Spencer Banzhaf, David Evans, and Alan Krupnick). RFF Report (September).

“Electricity, Renewables and Climate Change: Searching for an Efficient Policy,” 2004, (with Karen Palmer). RFF Report.

“Economic Efficiency and Distributional Consequences of Different Approaches to NO_x and SO₂ Allowance Allocation,” 2003, (with Karen Palmer) Prepared for the U.S. Environmental Protection Agency (October 2). <http://www.epa.gov/air/clearskies/econ.html> (accessed December 2, 2003).

“The Paparazzi Take a Look at a Living Legend: The SO₂ Cap-and-Trade Program for Power Plants in the United States,” 2003, (with Karen L. Palmer). RFF Discussion Paper 03-15, (April).

“The Evolution of NO_x Control Policy for Coal-Fired Power Plants in the United States,” 2003, (with David A. Evans). RFF Discussion Paper 03-23, (December).

“A Comparison of the Effects of the Distribution of Emission Allowances for Sulfur Dioxide, Nitrogen Oxides and Carbon Dioxide,” 2003, (with Karen Palmer). Research Report to the EPA National Center for Environmental Research (May 2).

“NO_x Emissions Trading and Episodic Air Quality Violations In Maryland,” 2003, (with Ranjit Bharvirkar and Alan J. Krupnick). Final Report Prepared for the Power Plant Research Program, State of Maryland (May).

“The RFF Haiku Electricity Market Model,” 2002, (with Anthony Paul) .RFF Report (May 22).

“Electricity Restructuring, Environmental Policy and Emissions: Insights from a Policy Analysis,” 2002, (with Karen Palmer, Anthony Paul and Ranjit Bharvirkar). Annapolis: Maryland Department of Natural Resources, Power Plant Research Program. Also see RFF Reports, December 2002.

“The Distributional Impacts of Carbon Mitigation Policies,” 2002, (with Richard D. Morgenstern, Lawrence H. Goulder, Mun Ho, Karen L. Palmer, William A. Pizer, James N. Sanchirico, and Jhih-Shyang Shih). Resources for the Future Issue Brief 02-03 (March).

“Investment in Electricity Transmission and Ancillary Environmental Benefits,” 2002, (with Cary Bloyd and Ranjit Bharvirkar). Discussion Paper 02-14 (March) Resources for the Future. Also see: conference proceedings, *5th Electric Utilities Environmental Conference*, Tucson, AZ, January 22-25, 2002.

“The Effect of Allowance Allocation on the Cost of Carbon Emission Trading,” 2001, (with Karen Palmer, Ranjit Bharvirkar and Anthony Paul). Resources for the Future Discussion Paper 01-30 (August).

“Restructuring and the Cost of Reducing NO_x Emissions in Electricity Generation,” 2001, (with Karen Palmer, Ranjit Bharvirkar, and Anthony Paul). Resources for the Future Discussion Paper 01-10REV (July).

“Workshop Report: Pollution Abatement Costs and Expenditures (PACE) Survey Design for 2000 and Beyond,” 2001, (with Alan Krupnick, Richard Morgenstern, William Pizer, and Jhih-Shyang Shih). Resources for the Future Discussion Paper 01-09 (March).

“The ‘Ancillary Benefits’ of Greenhouse Gas Mitigation Policies,” 2000, (with Michael A. Toman), Resources for the Future Climate Issue Brief #7 (August)

“Regional Impacts of Electricity Restructuring on Emissions of NO_x and CO₂,” 2000, (with Karen Palmer and Anthony Paul). Annapolis: Maryland Department of Natural Resources, Power Plant Research Program, PPRP-123 (June).

“Summary of the Science of Acidification in the Adirondack Park,” 2000, (with Alan J. Krupnick, Joe Cook, Anthony Paul, and Terrell Stoessell).

“Heterogeneity in Costs and Second-Best Policies for Environmental Protection,” 2000, (with Matt Cannon). Prepared for presentation at the Association of Agricultural and Resource Economists *Workshop on Market-Based Instruments for Environmental Protection*, Kennedy School of Government, 18-20 July 1999. Resources for the Future Discussion Paper 00-20 (April).

“RAINS-ASIA: A Critique and Guide to Future Research,” 1999, (with Alan J. Krupnick). Technical Paper, Resources for the Future (November 3).

“Measuring the Value of Health Improvements from Great Lakes Cleanup,” 1999, (with Alan J. Krupnick), RFF Discussion Paper 99-34 (April).

“The Opportunity for Short Run Carbon Mitigation in the Electricity Sector,” 1999, (with Karen Palmer and Anthony Paul). Presented at the Air & Waste Management Association Conference in Tucson, AZ in January.

“Lessons from the Integrated Assessment of Acid Deposition for Assessing Greenhouse Gas Emissions and Climate Change,” 1999, (with Cary N. Boyd and Richard Sonnenblick). Presented at the Air & Waste Management Association Conference in Tucson, AZ in January.

“State-Level Policies and Regulatory Guidance for Compliance in the Early Years of the SO₂ Emission Allowance Trading Program,” 1998, (with Ron Lile). RFF Discussion Paper 98-35, (May).

“The Benefits of Air Pollutant Emissions Reductions in Maryland: Results from the Maryland Externalities Screening and Valuation Model,” 1998, (with David Austin, Alan Krupnick, and Terrell Stoessell). Resources for the Future Discussion Paper 99-05 (October).

“Assessing the Impact of Electricity Restructuring on the Environment in Maryland,” 1998, (with Diane Brown, Matthew Kahal, Karen Palmer, Julie Ross and Mark Garrison). Presented at the Air & Waste Management Association Conference in San Diego, CA in June, (98-MP21.02(A483)).

“The Benefits of Reduced Air Pollutants in the U.S. from Greenhouse Gas Mitigation Policies,” 1997, (with Michael A. Toman). Resources for the Future Discussion Paper 98-01REV.

“An Assessment of the EPA’s SO₂ Emission Allowance Tracking System,” 1996, (with Ronald D. Lile and Douglas R. Bohi). Resources for the Future Discussion Paper 97-21, (November).

“The Ancillary Benefits of Avoiding Climate Change” 1996, (with several co-authors). *Conference Proceedings*, Climate Change Analysis Workshop, U.S. Environmental Protection Agency, Washington, DC, June 6.

“The *Water Resource Evaluation Framework*: A Software Tool for Collaboration Among Stakeholders in Hydroelectric Facility Relicensing,” 1996, (with Ken Frederick and Kris Wernstedt). Prepared for the Electric Power Research Institute (January).

“The Fiscal Effects of Electricity Generation Technology Choice: A Full Fuel Cycle Analysis” (with Pallavi R. Shah) Resources for the Future Discussion Paper 95-16, Washington, DC (March).

“The Social Benefits of Social Costing Research” 1995, (with Alan Krupnick and Karen Palmer). Resources for the Future, mimeo, Prepared for the European Commission, International Energy Agency and Organization for Economic Cooperation and Development Workshop on *The External Costs of Energy*, Brussels (January 30-31).

"Recommendations to NAPAP Regarding SO₂ Emission Projections" 1994, (with Douglas R. Bohi and John Reid) Resources for the Future, mimeo (June 15).

"Cost-Benefit Analysis and International Environmental Policy Decision Making: Problems of Income Disparity" 1994, (with Raymond J. Kopp). Discussion Paper 94-15, Resources for the Future, Washington, DC (February).

"'Easy-Riding' in Community Provision of Nonexcludable Public Goods" 1993, (with Winston Harrington and Carter Hood) Discussion Paper QE93-25, Resources for the Future, Washington, DC (September).

"The Promise and Prospect for SO₂ Emissions Trading in Europe," 1993, Discussion Paper QE93-22, Resources for the Future, Washington, DC (September).

"Bridging the Gap Between State and Federal Social Costing" 1993, (with Alan J. Krupnick). Discussion Paper QE93-19, Resources for the Future, Washington, DC (September).

"Compensation Principles for the Idaho Drawdown Plan" 1993, (with Kenneth D. Frederick) Discussion Paper ENR93-17, Resources for the Future, Washington, DC.

"Accounting for Environmental Costs in Electric Utility Resource Supply Planning" 1992, (with A. Myrick Freeman III, Winston Harrington, and Alan J. Krupnick) Discussion Paper QE92-14, Resources for the Future, Washington, DC, (April).

"Implementing Market-Based Environmental Policies: The Role of Compensation," 1991, (with Paul R. Portney). *Project 88/Round II Series: Designing Market-Based Strategies for Environmental Protection* (April).

"The Incentive Contract for Strategic Delegation in Bargaining," 1990, Discussion Paper QE90-18, Resources for the Future, Washington, DC, (May).

"Emissions Trading in the Electric Utility Industry" 1990, (with Douglas R. Bohi, Alan J. Krupnick, and Charles G. Stalon). Discussion Paper QE90-15, Resources for the Future, Washington, DC, (March).

"Local Government Initiatives for Affordable Housing" 1981, (with S. Schwartz and R. Johnston) Institute of Governmental Affairs, University of California, Davis, EQS No. 35, (December).

AWARDS

MacArthur Scholar, University of Michigan Program in International Peace and Security Studies, 1985-1989.

Institute of Public Policy Studies Fellowship, 1983-1984.

OTHER

Member, State of California Market Advisory Committee for Greenhouse Gas Policy, 2006 – present.

Member, National Academy of Sciences, Board on Environmental Studies and Toxicology, 2005-present.

Member, Environmental Protection Agency Advisory Council on Clean Air Compliance Analysis, 2004-present.

Member, Environmental Protection Agency Science Advisory Board Second Generation Model Advisory Panel, 2004-2005.

Member, Environmental Protection Agency, Scientific Advisory Board, Environmental Economics Advisory Committee, 1998-2004.

Member, Environmental Protection Agency, Scientific Advisory Board, Committee on Illegal Competitive Advantage, 2004.

Member, National Research Council, Committee on Air Quality Management in the United States, 2001-2004.

Reviewer, National Energy Modeling System, Energy Information Administration, 1992-present.

Reviewer of proposals for Environmental Protection Agency, National Science Foundation, Department of Energy.

Member, Environmental Protection Agency, Effluent Guidelines Task Force, 1996-1998.

Member, National Oceanic and Atmospheric Administration Blue Ribbon Panel on Valuation of Environmental Benefits in the Great Lakes Region, 1997-1998.

Member, Environmental Protection Agency, Scientific Advisory Board, Mercury Subcommittee, 1997.

Member, Management Board, New York State Environmental Externality Cost Study, 1993-1995.

Reviewer for:

American Economic Review

Ecological Economics

Energy Policy

Environmental and Resource Economics

The Electricity Journal

The Energy Journal

Journal of Economic Literature

Journal of Environmental Economics and Management

Journal of Environmental Planning and Management

Journal of Law and Economics

Journal of Policy Analysis and Management

Journal of Public Economics

Journal of Industrial Economics

Journal of Regulatory Economics

Land Economics

Resource and Energy Economics

and various state, federal and international research agencies.