**Jhih-Shyang Shih**

May 2019

|  |  |  |  |
| --- | --- | --- | --- |
|  | |  | |
| **Contact**  **Information** | 1616 P St., NW  Washington, DC 20036 | Office: (202)328-5028  Email: shih@rff.org | |
| **Education** | Post-Doc., Engineering and Public Policy, Carnegie Mellon University  Ph.D., System Analysis and Economics for Public Decision Making, Johns  Hopkins University  M.S., Environmental Systems, National Cheng-Kung University  B.S., Environmental Engineering, National Cheng-Kung University | | 1991-1995  1985-1990  1981-1983  1977-1981 |
| **Research**  **Experience** | Fellow, Resources for the Future  Consultant, Resources for the Future  AAAS-EPA Fellow, US EPA  Research Associate, Department of Engineering and Public Policy, Carnegie  Mellon University  Consultant, Argonne National Laboratory | | 1998-present  1995-1997  1995  1991-1995  1995 |
| **Teaching**  **Experience** | Instructor, Mathematical Foundation for Public Decision Making, Part-Time Programs in Engineering and Applied Science, Whiting School of Engineering, The Johns Hopkins University | | 1997 |
| **Honors and Awards** | Assistant Editor, International Journal of Society Systems Science  RFF New Frontiers Fund Award  AWWA Small Systems Division Best Paper Award  Who's Who in Science and Engineering, 4th-Ed  Director, Oversea Chinese Environmental Engineering and Scientist  Association  American Association for the Advancement of Science (AAAS)/EPA Fellow  Ji-Dian Liang Fellowship  Junior Scientist Traveling Award, NATO Advanced Study Institute  Research Assistant Fellowship, The Johns Hopkins University  Tuition Fellowship, The Johns Hopkins University  Chairman of Chinese Graduate Student Association, The Johns Hopkins  University  Graduate Scholarship, National Cheng-Kung University | | 2007-present  2012  2007  1998  1997-1998  1995  1994  1993  1987-1990  1985-1990  1986  1981-1983 |
| **Invited**  **Reviewer** | *Agricultural and Resource Economics Review, American Association for the Advancement of Science, American Journal of Agricultural Economics, Annals of Regional Science, Automatica,* Environment and Development Economics, *Environmental Science and Technology,* Growth and Change, International Transactions in Operational Research, Journal of the Air and Waste Management Association, *Journal of Environmental Economics and Management, Journal of Hazardous Materials, Journal of Policy Analysis and Management, Land Economics, Municipal Engineer, Science of the Total Environment, Socio-Economic Planning Sciences, Utility Policy*, *Water Resource Management*, Argonne National Laboratory, Swarthmore College Honors Program examiner (Operations Research and Environmental Systems Engineering), U.S. Environmental Protection Agency (EPA), World Resource Institute. | | |
| **Certification**  **Skills**  **Referred Publications** | SAS certified base programmer for SAS 9 ESRI certifications for ArcGIS Desktop I and II  EcoMod School certification for Practical General Equilibrium Modeling with GAMS. 2019.  **Software:** GAMS, SAS, Stata, R, ArcGIS, Matlab, Analytica, IMPLAN, BenMAP, SPARROW,  BASIN, ISCST3, SAS Enterprise Guide.  **Coding:** FORTRAN, BASIC, Python, C.  **Languages:** English, Mandarin Chinese  Linn, Joshua and Jhih-Shyang Shih. “[Does Electricity Storage Innovation Reduce Greenhouse Gas Emissions?](http://www.rff.org/research/publications/does-electricity-storage-innovation-reduce-greenhouse-gas-emissions)” ***Journal of Environmental Economics and Management*** (Accepted).  Kailin Kroetz, Jhih-Shyang Shih, Juha V. Siikamäki, Vladimir Marianov, Alan Krupnick, and Zuyan Chu. (2018) “Systematically Incorporating Environmental Objectives into Shale Gas Pipeline Development: A Binary Integer, Multi-Objective Spatial Optimization Model.” ***Environmental Science & Technology***.  <https://pubs.acs.org/doi/abs/10.1021/acs.est.9b01583>  Lucija Muehlenbachs, Elaine Swiedler, Ziyan Chu, Jhih-Shyang Shih, and Alan Krupnick (2019). “ Should solid waste from shale gas development be regulated as hazardous waste?” ***Energy Policy***, Vol. 129. Pp. 1020-1033.  <https://doi.org/10.1016/j.enpol.2019.02.016>  Ho, Jacqueline S., Jhih-Shyang Shih, Lucija A. Muehlenbachs, Clayton Munnings, and Alan J. Krupnick. (2018). “Managing Environmental Liability: An Evaluation of Bonding Requirements for Oil and Gas Wells in the United States.” ***Environmental Science & Technology***, 52 (7), pp. 3908-3916. **doi:**10.1021/acs.est.7b06609.  <https://pubs.acs.org/doi/10.1021/acs.est.7b06609>  Yang, Qichun, Xuesong Zhang, Xingya Xu, Ghassem R. Asrar, Richard A. Smith, Jhih-Shyang Shih, and Shuiwang Duan (2016). “Spatial Pattern and Environmental Controls of Particulate Organic Carbon in Surface Waters in the Conterminous United States.” ***Science of the Total Environment***, Vol. 554, pp. 266-275. doi:10.1016/j.scitotenv.2016.02.164.  <http://www.sciencedirect.com/science/article/pii/S0048969716303758>  Shih, Jhih-Shyang, James E. Saiers, Shimon C. Anisfeld, Ziyan Chu, Lucija A. Muehlenbachs, and Sheila M. Olmstead (2015). “Characterization and Analysis of Liquid Waste from Marcellus Shale Gas Development.” ***Environmental Science & Technology***, Vol. *49, No.* 16, pp. 9557–9565. **doi:** 10.1021/acs.est.5b01780.  <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b01780>  Li, Shanjun, Han Kyul Yoo, Molly Macauley, Karen L. Palmer and Jhih-Shyang Shih (2015). “Assessing the Role of Renewable Energy Policies in Landfill Gas to Energy Projects.” ***Energy Economics***, Vol. 49, pp 687-697. doi: 10.1016/j.eneco.2015.03.022.  <http://www.sciencedirect.com/science/article/pii/S0140988315001140>  Olmstead, Sheila, Lucija Muehlenbachs, Jhih-Shyang Shih, Jessica Chu, and Alan Krupnick (2013). “Shale gas development impacts on surface water quality in Pennsylvania.” ***Proceedings of the National Academy of Sciences***. Online publication. doi: 10.1073/pnas.1213871110. <http://www.pnas.org/content/early/2013/03/06/1213871110.abstract>  Harrington, Winston, Richard D. Morgenstern, Jhih-Shyang Shih, and Michelle L. Bell (2012). “Did the Clean Air Act Amendments of 1990 really improve air quality?” ***Air Quality, Atmosphere & Health***. Vol. 5: Iss. 4, pp.353-367. doi:10.​1007/​s11869-012-0176-5.  <http://link.springer.com/article/10.1007/s11869-012-0176-5>  Pizer, William A., Richard D. Morgenstern, and Jhih-Shyang Shih (2011). “The Performance of Industrial Sector Voluntary Climate Programs: Climate Wise and 1605(b).” ***Energy Policy,*** Vol. 39: Iss. 12, pp 7907-7916. doi:10.1016/j.enpol.2011.09.040.  <http://www.sciencedirect.com/science/article/pii/S0301421511007294>  Macauley, Molly, Joe Maher, and Jhih-Shyang Shih (2010). “From Science to Applications: Determinants of Diffusion in the Use of Earth Observations.” ***Journal of Terrestrial Observation*:** Vol. 2: Iss. 1, Article 4.  <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1064&context=jto>  Shih, Jhih-Shyang, Dallas Burtraw, Karen L. Palmer, and Juha Siikamäki (2008). “Air Emissions of Ammonia and Methane from Livestock Operations: Valuation and Policy Options,” ***Journal of Air and Waste Management Association***, Vol. 58, pp. 1117-1129. doi:10.3155/1047-3289.58.9.1117. <http://www.tandfonline.com/doi/pdf/10.3155/1047-3289.58.9.1117>  Macauley, Molly K. and Jhih-Shyang Shih (2007). “Satellite Solar Power: Renewed Interest in an Era of Climate Change?” ***Space Policy***, Vol. 23, Issue 2, pp. 108-120. doi:10.1016/j.spacepol.2007.02.010. <http://www.sciencedirect.com/science/article/pii/S0265964607000264>  Bergin, Michelle S., Jhih-Shyang Shih, Alan J. Krupnick, James W. Boylan, James G. Wilkinson, M. Talat Odman, and Armistead G. Russell (2007).  “Regional Air Quality: Local and Interstate Impacts of NOx and SO2 Emissions on Ozone and Fine Particulate Matter in the Eastern United States,” ***Journal of Environmental Science and Technology***, Vol. 41, No. 13, pp. 4677-4689.  **doi:**10.1021/es062302s. <http://pubs.acs.org/doi/abs/10.1021/es062302s>  Palmer, Karen L., Dallas Burtraw, and Jhih-Shyang Shih (2007). “The Benefits and Costs of Reducing Emissions from the Electricity Sector,” ***Journal of Environmental Management,*** Vol. 83, No. 1, pp. 115-130. doi:10.1016/j.jenvman.2006.02.011.  <http://www.sciencedirect.com/science/article/pii/S0301479706000831>  Louis, Garrick E. and Jhih-Shyang Shih (2007). “A Flexible Inventory Model for MSW Recycling,” ***Socio-Economic Planning Sciences,*** Vol. 41, Issue 1, pp.61-89. doi:10.1016/j.seps.2004.10.008.  <http://www.sciencedirect.com/science/article/pii/S0038012105000364>  Blackman, Allen, Stephen Newbold, Jhih-Shyang Shih, David Evans, Michael Batz, and Joseph Cook (2006). “The Benefits and Costs of Informal Sector Pollution Control: Mexican Brick Kilns,” ***Environment and Development Economics***, October, Vol. 11, issue 5, pp. 603-627.  <http://dx.doi.org/10.1017/S1355770X06003159>  Shih, Jhih-Shyang, Winston Harrington, William A. Pizer and Kenneth **Gillingham (2006). “**Economies of Scale in Community Water Systems,” ***Journal of American Water Work Association***, September, Vol. 98, No. 9, pp 100-108. (2007 AWWA Small Systems Division Best Paper Award) <http://www.awwa.org/publications/journal-awwa/abstract/articleid/15520.aspx>  Morgenstern, Richard D., Mun S. Ho, Jhih-Shyang Shih, Xuehua Zhang (2004). “The Near-Term Impacts of Carbon Mitigation Policies on Manufacturing Industries,” ***Energy Policy***, November. Vol. 32, No. 16, pp. 1825-1841. doi:10.1016/S0301-4215(03)00171-X.  <http://www.sciencedirect.com/science/article/pii/S030142150300171X>  Macauley, Molly K., Karen L. Palmer and Jhih-Shyang Shih (2003). “Dealing with Electronic Waste: Modeling the Costs and Environmental Benefits of Computer Monitor Disposal,” ***Journal of Environmental Management***, Vol. 68, No. 1, pp. 13-22. doi:10.1016/S0301-4797(02)00228-1  <http://www.sciencedirect.com/science/article/pii/S0301479702002281>  Morgenstern, Richard D., William A. Pizer and Jhih-Shyang Shih (2002). "Jobs versus the Environment: An Industry-Level Perspective," ***Journal of Environmental Economics and Management***, 43(3), 412-436. doi:10.1006/jeem.2001.1191. <http://www.sciencedirect.com/science/article/pii/S009506960191191X>  Marianov, Vladimir, Charles S. ReVelle and Jhih-Shyang Shih (2002). “Anticoverage Models for Obnoxious Material Transportation,” ***Environment and Planning B:* *Planning and Design***, 29(1), 141 - 150.  <http://epb.sagepub.com/content/29/1/141.abstract>  Morgenstern, Richard D., William A. Pizer and Jhih-Shyang Shih (2001). "The Cost of Environmental Protection,"***The Review of Economics and Statistics***, 83(4): 732-738.  doi:10.1162/003465301753237812.  <http://www.mitpressjournals.org/doi/abs/10.1162/003465301753237812#.V2CbrdkrKM8>  Shih, Jhih-Shyang, Garrick E. Louis and Karen Palmer (2001). "Recycling" in Encyclopedia of Global Change: Environmental Change and Human Society, Goudie A.S. Ed., Oxford University Press, March.  [https://global.oup.com/academic/product/encyclopedia-of-global-change-9780195108255?cc=us&lang=en&#](https://global.oup.com/academic/product/encyclopedia-of-global-change-9780195108255?cc=us&lang=en&)  Morgenstern, Richard D., Jhih-Shyang Shih and Stuart Sessions (2000). "Comparative Risk Assessment: An International Comparison of Methodologies and Results," ***Journal of Hazardous Materials***, 78, 19-39. doi:10.1016/S0304-3894(00)00215-6.  <http://www.sciencedirect.com/science/article/pii/S0304389400002156>  Shih, Jhih-Shyang, Armistead G. Russell and Gregory J. McRae (1998). "An Optimization Model for Photochemical Air Pollution Control," ***European Journal of Operational Research***, 106(1), 1-14. doi:10.1016/S0377-2217(97)00359-7.  <http://www.sciencedirect.com/science/article/pii/S0377221797003597>  Shih, Jhih-Shyang and H. Christopher Frey (1995). "Coal Blending Optimization Under Uncertainty," ***European Journal of Operational Research***, 83, 452-465.  doi:10.1016/0377-2217(94)00243-6.  <http://www.sciencedirect.com/science/article/pii/0377221794002436>  Shih, Jhih-Shyang and Charles S. ReVelle (1995). "Water Supply Operations during Drought: A Discrete Hedging Rule," ***European Journal of Operational Research***, 82, 163-175.  doi:10.1016/0377-2217(93)E0237-R.  <http://www.sciencedirect.com/science/article/pii/0377221793E0237R>  Shih, Jhih-Shyang and Charles S. ReVelle (1994). "Water Supply Operations during Drought: A Continuous Hedging Rule," ***Journal of Water Resources Planning and Management*, ASCE**, 120(5), 613-629.  <http://ascelibrary.org/doi/abs/10.1061/(ASCE)0733-9496(1994)120:5(613)> | | |
| **BOOK PUBLICATIONS** | Bergamaschi, Brian A., Richard A. Smith, Michael J. Sauer, Jhih-Shyang Shih and Lei Ji. “Terrestrial Fluxes of Nutrients and Sediment to Coastal Waters and Their Effects on Coastal Carbon Storage in the Eastern United States**.”** In Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the eastern United States. Zhu, Zhiliang, and Reed, Bradley, eds. Professional Paper 1804, 204 p. 2014. U.S. Geological Survey. Reston, VA. <http://dx.doi.org/10.3133/pp1804>.  Shih, Jhih-Shyang, Sheila Olmstead, Ziyan Chu, Alan Krupnick, Lucija Muehlenbachs, James Saiers, and Shimon Anisfeld. Wastewater Characteristics from Marcellus Shale Gas Development in Pennsylvania. In Alan Krupnick, editor, *Managing the Risks of Shale Gas: Key Findings and Further Research*, pages 8-9. Resources for the Future, Washington, DC 2013.  Bergamaschi, Brian A., Richard A. Smith, Michael J. Sauer, and Jhih-Shyang Shih. “Terrestrial Fluxes of Sediments and Nutrients to Pacific Coastal Waters and Their Effects on Coastal Carbon Storage Rates.” In Baseline and Projected Future Carbon Storage and Greenhouse-Gas Fluxes in Ecosystems of the Western United States. Zhiliang Zhu and B.C. Reed, eds. Professional Paper 1797. November, 2012. U.S. Geological Survey. Reston, VA.  <http://pubs.usgs.gov/pp/1797/>  Shih, Jhih-Shyang, Winston Harrington, William Pizer, and Kenneth Gillingham. “Economies of Scale in Community Water Systems.” In The Business of Water: A Concise Overview of Challenges and Opportunities in the Water Market. Steve Maxwell, Editor. January, 2008. American Water Works Association. Denver, CO.  Morgenstern, Richard D., William A. Pizer, Jhih-Shyang Shih. “Evaluating Voluntary U.S. Climate Programs: The Case of Climate Wise.” In the Reality Check: The Nature and Performance of Voluntary Environmental Programs in the United States, Europe, and Japan. Morgenstern and Pizer, Editors. February, 2007. Resources for the Future, Washington DC.  Blackman, Allen, Steven Newbold, Jhih-Shyang Shih, David Evans, Joseph Cook and Michael Batz. “Benefits and Costs of Controlling Small Firm Pollution: Informal Brickmaking in Ciudad Juárez, Mexico.” In the Small Firms and the Environment in Developing Countries: Collective Impacts, Collective Action. Allen Blackman, Editor. February, 2006. Resources for the Future, Washington DC.  Krupnick, Alan and Jhih-Shyang Shih, A New Approach to Air Quality Management, in New Approaches on Energy and the Environment: Policy Advice for the President, Morgenstern and Portney Ed., November 2004. Resources for the Future, Washington DC. | | |
| **RESOURCES**  **RFF BLOG**  **RFF REPORT** | Jhih-Shyang Shih and Karen Palmer. Could Blockchain Technology Improve Water, Wastewater, and Solid Waste Management in the Oil and Gas Industry? March 22, 2019.  <https://www.resourcesmag.org/archives/could-blockchain-technology-improve-water-wastewater-and-solid-waste-management-oil-and-gas-industry/>  Macauley, Molly K., Karen L. Palmer, Jhih-Shyang Shih, Sarah Cline, and Heather Holsinger. “The Environment and the Information Age,” *Resources*, Fall 2001, Issue 145, 6-9.  Shanjun Li, Han Kyul Yoo, Jhih-Shyang Shih. “Renewable Energy from Landfills,” *Resources*, 2015, Issue 188, 18-19. <http://www.rff.org/RFF/Documents/RFF-Resources-188_Featurette-LiYooShih.pdf>  Lucija Muehlenbachs, Jhih-Shyang Shih, and Alan Krupnick. Is Shale Drilling Waste Toxic? Comments on EPA’s Recent Report. Resources for the Future. Common Resources. May 2, 2019.  <https://www.resourcesmag.org/common-resources/is-shale-drilling-waste-toxic-comments-on-epas-recent-report/>  Jhih-Shyang Shih and Dallas Burtraw. California’s New Legislation on Short-Lived Climate Pollutants. Resources for the Future. November 11, 2016.  <http://www.rff.org/blog/2016/california-s-new-legislation-short-lived-climate-pollutants>  Jhih-Shyang Shih. Resources Magazine: Renewable Energy from Landfills. Resources for the Future. January 28, 2015.  <http://www.rff.org/blog/2015/resources-magazine-renewable-energy-landfills>  Molly K. Macauley, Karen L. Palmer and Jhih-Shyang Shih. Assessing Landfill Gas-to-Energy Adoption Policies. July 9, 2014.  <http://www.rff.org/blog/2014/assessing-landfill-gas-energy-adoption-policies>  Jaqueline Ho, Alan Krupnick, Katrina McLaughlin, Clayton Munnings, and Jhih-Shyang Shih. Plugging the Gaps in Inactive Well Policy: Summary of Key Findings. Resources for the Future Report. May 2016.  <http://www.rff.org/files/document/file/RFF-Rpt-PluggingInactiveWells_ExecutiveSummary_0.pdf>  Jaqueline Ho, Alan Krupnick, Katrina McLaughlin, Clayton Munnings, and Jhih-Shyang Shih. Plugging the Gaps in Inactive Well Policy. Resources for the Future Report. May 2016. <http://www.rff.org/files/document/file/RFF-Rpt-PluggingInactiveWells.pdf>  Shimon Anisfeld, Ziyan Chu, Hal Gordon, Madeline Gottlieb, Alan J. Krupnick, Lucija Anna Muehlenbachs, Sheila M. Olmstead, Nathan Richardson, James Saiers, Jhih-Shyang Shih, Juha V. Siikamäki, Elisheba Beia Spiller, Chris Timmins, Hannah Wiseman. Managing the Risks of Shale Gas: Key Findings and Further Research. Resources for the Future Report. May 2013.  <http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=22216>  Dallas Burtraw, Carolyn Fischer, Clayton Munnings, Karen L. Palmer, Anthony Paul, Nathan Richardson, Jhih-Shyang Shih, Roberton C. Williams III. Comments to the US Environmental Protection Agency on Its Proposed Clean Power Plan. Resources for the Future Report. December 2014. <http://www.rff.org/RFF/Documents/RFF-Rpt-CPPComments.pdf> | | |
| **CONFERENCE PROCEEDINGS** | Shih, Jhih-Shyang, Dallas Burtraw, Karen Palmer and Juha Siikamaki. “Valuation of Air Emissions from Livestock Operations and Options for Policy.” Proceedings of Workshop on Agricultural Air Quality: State of the Science, June 5-8, 2006. 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, 2006.  Shih, Jhih-Shyang, Michelle S. Bergin, Alan J. Krupnick, and Armistead G. Russell. “Source-Receptor Matrices and Cost-Benefit Analysis With Meteorological Variability for Ambient Ozone and Fine Particulates: Development and Demonstration of an Integrated Model and Framework,” *Proceeding of Air & Waste Management Association Annual Conference*, June 22-26, 2003, San Diego, CA.  Shih, Jhih-Shyang and H. Christopher Frey. "Coal Blending Optimization Under Uncertainty," Tenth Annual International Pittsburgh Coal Conference, September 1993, Pittsburgh, Pennsylvania, p. 1110-1115.  Shih, Jhih-Shyang and Charles S. ReVelle. "Water Supply Operations during Drought," Proceeding of Water Forum '92, August 1992, Baltimore, Maryland, p. 310-315. | | |
| **DISCUSSION PAPERS** | Shih, Jhih-Shyang, Elaine Swiedler, and Alan J. Krupnick. “A Model for Shale Gas Wastewater Management.” RFF Discussion Paper 16-44. October 17, 2016. <http://www.rff.org/research/publications/model-shale-gas-wastewater-management> Linn, Joshua and Jhih-Shyang Shih. “[Does Electricity Storage Innovation Reduce Greenhouse Gas Emissions?](http://www.rff.org/research/publications/does-electricity-storage-innovation-reduce-greenhouse-gas-emissions)” RFF Discussion Paper 16-37. September 2016. <http://www.rff.org/files/document/file/RFF-DP-16-37.pdf>  Li, Shanjun, Han Kyul Yoo, Jhih-Shyang Shih, Karen L. Palmer, Molly K. Macauley. “Assessing the Role of Renewable Energy Policies in Landfill Gas Energy Projects.” RFF Discussion Paper 14-17. July 2014.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-14-17.pdf>  Li, Shanjun, Han Kyul Yoo, Molly Macauley, Karen L. Palmer and Jhih-Shyang Shih. “Assessing the Role of Renewable Energy Policies in Landfill Gas to Energy Projects.” (May 2, 2014).  <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2432374>  Olmstead, Sheila, Lucija Muechlenbachs, Jhih-Shyang Shih, Ziyan Chu, and Alan Krupnick. “Shale Gas Development Impacts on Surface Water Quality in Pennsylvania.” RFF Discussion Paper. August 2012. Shih, Jhih-Shyang, Richard B. Alexander, Richard A. Smith, Elizabeth W. Boyer, Gregory E. Schwarz, and Susie Chung. (2011) “An initial SPARROW model of land use and in-stream controls on total organic carbon in streams of the conterminous United States.” U.S. Geological Survey Open-File Report 2010–1276, 22 p. <http://pubs.usgs.gov/of/2010/1276/>  Macauley, Molly K. and [Jhih-Shyang Shih](http://www.rff.org/Researchers/Pages/ResearchersBio.aspx?ResearcherID=62). “[Assessing Investment in Future Landsat Instruments: The Example of Forest Carbon Offsets](http://www.rff.org/RFF/Documents/RFF-DP-10-14.pdf).” RFF Discussion Paper 10-14. March 2010.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-10-14.pdf>  Ho, Mun, Richard D. Morgenstern, Jhih-Shyang Shih. “Impact of Carbon Price Policies on U.S. Industry.” RFF Discussion Paper 08-37. December 2008.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-08-37.pdf>  Pizer, William A., Richard D. Morgenstern, Jhih-Shyang Shih. “Evaluating Voluntary Climate Programs in the United States.” RFF Discussion Paper 08-13. July 2008.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-08-13-REV.pdf>  Macauley, Molly K. and Jhih-Shyang Shih. “A Cost-Index Approach to Valuing Investment In Far Into The Future Environmental Technology.” RFF Discussion Paper 07-29. June 2007.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-07-29.pdf>  Shih, Jhih-Shyang, Dallas Burtraw, Karen Palmer and Juha Siikamaki. “Air Emissions of Ammonia and Methane from Livestock Operations: Valuation and Policy Options.” RFF Discussion Paper 06-11. March 2006.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-06-11.pdf>  Palmer, Karen L., Dallas Burtraw, and Jhih-Shyang Shih. “Reducing Emissions from the Electricity Sector: The Costs and Benefits Nationwide and for the Empire State.” RFF Discussion Paper 05-23. June 2005.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-05-23.pdf>  Shih, Jhih-Shyang, Michelle S. Bergin, Armistead G. Russell and Alan Krupnick. “Source-Receptor Relationships for Ozone and Fine Particulates in the Eastern U.S.” RFF Discussion Paper 04-25. May 2004.  <http://ageconsearch.umn.edu/bitstream/10572/1/dp040025.pdf>  Shih, Jhih-Shyang, Winston Harrington, William A. Pizer and Kenneth **Gillingham. “**Economies of Scale and Technical Efficiency in Community Water Systems.” RFF Discussion Paper 04-15. March 2004.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-04-15.pdf>  Shih, Jhih-Shyang, Michelle S. Bergin, Alan J. Krupnick, and Armistead G. Russell. “Controlling Ozone and Fine Particulates: Cost Benefit Analysis with Meteorological Variability,” RFF Discussion Paper 03-55. December 2003.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-03-55.pdf>  Macauley, Molly K. and Jhih-Shyang Shih. “Effects of Carbon Policies and Technology Change,” RFF **Discussion Paper 03-14.** December 2003.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-03-14.pdf>    Pizer, William A., Winston Harrington, Raymond J. Kopp, Richard D. Morgenstern and Jhih-Shyang Shih. “**Technology Adoption and Aggregate Energy Efficiency,” RFF Discussion Paper**  02-52. October 2002.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-02-52.pdf>  Louis, Garrick and Jhih-Shyang Shih. “A Flexible Inventory Model for Municipal Solid Waste Recycling,” RFF Discussion Paper 02-48. September 2002.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-02-48.pdf>  Morgenstern, Richard D., Mun Ho, Jhih-Shyang Shih, Xuehua Zhang. “The Near-Term Impacts of Carbon Mitigation Policies on Manufacturing Industries,” RFF Discussion Paper 02-06. March 2002.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-02-06.pdf>  Macauley, Molly K., Jhih-Shyang Shih, Emily Aronow, David Austin, Tom Bath, and Joel Darmstadter. “Measuring the Contribution to the Economy of Investments in Renewable Energy: Estimates of Future Consumer Gains,” RFF Discussion Paper 02-05. February 2002.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-02-05.pdf>  Macauley, Molly K., Karen L. Palmer, Jhih-Shyang Shih, Sarah Cline, and Heather Holsinger. “Modeling the Costs and Environmental Benefits of Disposal Options for End-of-Life Electronic Equipment: The Case of Used Computer Monitors,” RFF Discussion Paper 01-27. June 2001.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-01-27.pdf>  Burtraw, Dallas, Alan J. Krupnick, Richard D. Morgenstern, William A. Pizer and Jhih-Shyang Shih. “Workshop Report: Pollution Abatement Costs and Expenditures (PACE) Survey Design for 2000 and Beyond,” RFF Discussion Paper 01-09. April 2001.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-01-09.pdf>  Allen Blackman, Steven Newbold, Jhih-Shyang Shih and Joe Cook. “ The Benefits and Costs of Informal Sector Pollution Control: Mexican Brick Kilns," RFF Discussion Paper 00-46. Oct. 2000.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-00-46.pdf>  Morgenstern, Richard D., William A. Pizer and Jhih-Shyang Shih. “Jobs versus the Environment: Is There a Trade-off?" RFF Discussion Paper 99-01-REV. June. 2000.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-99-01-REV.pdf>  Morgenstern, Richard D., William A. Pizer and Jhih-Shyang Shih. “The Cost of Environmental Protection," RFF Discussion Paper 98-36 REVISED. August 1999.  <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-98-36-REV.pdf>  Morgenstern, Richard D., William A. Pizer and Jhih-Shyang Shih. “Are We Overstating the Economic Costs of Environmental Protection?” RFF Discussion Paper 97-36. May 1997.  <https://www2.census.gov/ces/wp/1997/CES-WP-97-12.pdf> | | |