

Deepak Rajagopal

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AREAS OF RESEARCH	Lifecycle assessment, Industrial Ecology, Climate Policy, Agricultural and Energy Economics and policy, Biofuels
EDUCATION	Ph.D, Energy and Resources, University of California, Berkeley, 2009 M.S., Agricultural and Resource Economics, UC California, Berkeley, 2009 M.S., Mechanical Engineering, University of Maryland, College Park, 2001 B.Tech., Mechanical Engineering, Indian Institute of Technology, Madras, India, 1999
EMPLOYMENT	<i>Associate Professor</i> Jul-2018 – Institute of the Environment and Sustainability, UC Los Angeles <i>Assistant Professor</i> Jul-2010 to Jun-2018 Institute of the Environment and Sustainability, UC Los Angeles <i>Visiting Assistant Professor</i> Aug 2013 – Jun 2015 School of Public and Environmental Affairs, Indiana Univ, Bloomington, IN <i>Post-doctoral Researcher</i> August 2009 to June 2010 Energy Biosciences Institute, UC Berkeley <i>Research Engineer, Structural Integrity and Reliability Group</i> August 2001 to May 2004 United Technologies Research Center, East Hartford, Connecticut
PEER-REVIEWED PUBLICATIONS	J. Ifft, D. Rajagopal and R. Weldzius (2018): Ethanol Plant Location and Land Use: A Case Study of CRP and the Ethanol Mandate, <i>Applied Economic Perspectives and Policy</i> , doi:10.1093/aep/ppy007, 2018 D. Rajagopal (2017): A heuristic screening aid for Consequential LCA <i>Journal of Industrial Ecology</i> DOI: 10.1111/jiec.12699 D. Rajagopal, C. V. Zapata and H. Maclean (2017): Life cycle assessment for Economists. <i>Annual Review of Resource Economics</i> DOI: 10.1146/annurev-resource-100815-095513 D. Rajagopal (2016): The elasticity of global cropland with respect to crop production and the implications for peak cropland, <i>Environmental Research Letters</i> , DOI:10.1088/1748-9326/11/11/114016 D. Rajagopal (2016): A step towards a general mathematical framework for Consequential Life Cycle Assessment. <i>Journal of Industrial Ecology</i> Volume 21, Issue 2, April 2017, Pages: 261-271 D. Rajagopal (2016): A synthesis of unilateral approaches to mitigating emissions leakage under incomplete policies. <i>Climate Policy</i> DOI:10.1080/14693062.2016.1150249

- M. Accordino and D. Rajagopal (2015): When a National Cap-and-Trade Policy with a Carve-out Provision May Be Preferable to a National CO₂ Tax, *The Energy Journal*, Vol.36, No.3 189–207
- D. Rajagopal (2015): On approaches to mitigate emissions leakage under biofuel policies. *Global Change Biology Bioenergy*, Volume 8, Issue 2, March 2016, Pages: 471–480
- D. Rajagopal, R. Plevin, G. Hochman, and D. Zilberman (2015): Multi-criteria comparison of alternative fuel policies: Renewable fuel standards, clean fuel standards and fuel GHG tax. *Energy Economics*, Vol.49, 359–369
- S. Z. Attari and D. Rajagopal (2015): Enabling energy conservation through effective decision aids. *Journal of Sustainability Education*. Volume 8
- G. Hochman, D. Rajagopal, G. Timilsina and D. Zilberman (2014). Quantifying the causes of the global food commodity price crisis. *Biomass and Bioenergy* 68, 106–114
- D. Rajagopal (2014): Consequential life cycle assessment of policy vulnerability to price effects. *Journal of Industrial Ecology* Volume 18, Issue 2, April 2014, Pages: 164–175
- D. Rajagopal (2013): The fuel market effects of biofuel policies and implications for regulations based on lifecycle emissions. *Environmental Research Letters* 8(024013)
- D. Rajagopal and D. Zilberman (2013): On market-mediated emissions and regulations on life cycle emissions. *Ecological Economics* 90, 70–84
- D. Rajagopal and R. Plevin (2013): Implications of market-mediated emissions and uncertainty for biofuel policies. *Energy Policy*. 56, 75–82
- D. Zilberman, S. Barrows, G. Hochman and D. Rajagopal (2013): On the Indirect Effect of Biofuel. *American Journal of Agricultural Economics* 95(5): 1332–1337
- D. Zilberman, G. Hochman, D. Rajagopal, S. Sexton and G. Timilsina (2012): The Impact of Biofuels on Commodity Food Prices: Assessment of Findings. *American Journal of Agricultural Economics* 95(2): 275–281
- G. Hochman, S. Kaplan, D. Rajagopal, and D. Zilberman (2012): Biofuel and Food-Commodity Prices, *Agriculture*, 2(3), 272–281, doi:10.3390/agriculture2030272
- D. Rajagopal (2011): The Economics of Biofuel Policies. *Biofuels* 2(6) 599–601
- D. Rajagopal, G. Hochman and D. Zilberman (2011): Indirect fuel use change and the environmental impact of biofuel policies. *Energy Policy* 39, 228–233
- G. Hochman, D. Rajagopal and D. Zilberman (2011). The Effect of Biofuels on International Oil Markets. *Applied Economic Perspectives and Policy* vol. 33 (3), 402–427
- D. Zilberman, G. Hochman, and D. Rajagopal (2011). Indirect Land Use Change: A Second Best Solution to a First Class Problem. *Agbioforum* 13(4), 382–390
- D. Zilberman, G. Hochman, and D. Rajagopal (2011). On the inclusion of Indirect Land Use in Biofuel Regulations *Illinois Law Review* 2 413–434
- G. Hochman, D. Rajagopal, G. Timilsina and D. Zilberman (2011). The Role of

Inventory Adjustments in Quantifying Factors Causing Food Price Inflation *World Bank Policy Research Working Paper* 5744

G. Hochman, D. Rajagopal and D. Zilberman (2010). Are Biofuels the Culprit? OPEC, Food, and Fuel. *American Economic Review Papers and Proceedings*, 100(2): 183 - 187

G. Hochman, D. Rajagopal and D. Zilberman (2010). The Effect of Biofuels on Crude Oil Markets. *AgBioForum* vol. 13 (2), 112-118

D. Rajagopal, S.Sexton, G. Hochman and D. Zilberman (2009). Recent developments in renewable technologies: R&D investment in advanced biofuels. *Annual Review of Resource Economics*, vol. 1, 1.11.24

D. Rajagopal, S.Sexton, G. Hochman, D. Roland-Holst, and D. Zilberman (2009). Model estimates of food-versus-biofuel trade-off, *California Agriculture*, vol. 63(4), 199-201

S. Sexton, D. Rajagopal, G. Hochman, D. Zilberman, and D. Roland-Holst, (2009). Biofuel policy must evaluate environmental, food security and energy goals to maximize net benefits. *California Agriculture*, 63(4), 191-198

M Khanna, G. Hochman, D. Rajagopal, S Sexton and David Zilberman (2009). Sustainability of food, energy and environment with biofuels. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources 2009*, 4(28)

D. Rajagopal and D. Zilberman (2008). Environmental, economic and policy aspects of biofuels. *Foundations and Trends in Microeconomics*, 4(5): 353-469 and *World Bank Policy Research Working Paper* 4341

D. Rajagopal (2008). Implications of India's biofuel policies for food, water and the poor. *Water Policy*, vol. 10(S1): 95-106

D. Zilberman, T. Sproul, D. Rajagopal, S. Sexton, and P. Hellegers (2008). "Rising energy prices and the economics of water in agriculture." *Water Policy* vol. 10: 11

S Sexton, D. Zilberman, D. Rajagopal, and G. Hochman (2008). The role of biotechnology in a sustainable biofuel future. *AgBioForum*, 12(1): 1-11

D. Rajagopal, S.Sexton, G. Hochman, D. Roland-Holst, and D. Zilberman (2007). Challenge of biofuel: filling the tank without emptying the stomach. *Environmental Research Letters*, 2(2):1-9

S. K. Gupta and D. Rajagopal (2002). Forming part families for generating shared press-brake setups. *Journal of Manufacturing Systems*, 21(5):329-349

BOOK CHAPTERS

D. Rajagopal. Challenges in quantifying and regulating the unintended environmental consequences of biofuel expansion. In: *Bioenergy and Land Use Change* (eds Qin Z, Mishra U, Hastings A). John Wiley & Sons, Inc, Hoboken, NJ. 2017 (or In press).

Zilberman D., Rajagopal D., Kaplan S. (2017) Effect of Biofuel on Agricultural Supply and Land Use. In: Khanna M., Zilberman D. (eds) *Handbook of Bioenergy Economics and Policy: Volume II*. Natural Resource Management and Policy, vol 40. Springer, New York, NY

G. Hochman, D. Rajagopal, G. Timilsina, and D. Zilberman. "Impacts of Biofuels on Food Prices." In *The Impacts of Biofuels on the Economy, Environment, and Poverty*, Chapter 4, pp. 47-64. Springer New York, 2014

D. Zilberman, S. Kaplan, G. Hochman, and D. Rajagopal. "Political Economy of Biofuels." In *The Impacts of Biofuels on the Economy, Environment, and Poverty*, Chapter 11 pp. 131-144. Springer New York, 2014

D. Zilberman, D. Rajagopal and G. Hochman (2012): Economist's perspective on biofuels. In C. Taylor, R. Lomneth, F. Wood-Black (Eds.) *Perspectives on Biofuels: Potential Benefits and Possible Pitfalls*, American Chemical Society

G. Hochman, D. Rajagopal, G. Timilsina, and D. Zilberman (2012): Inventories and the Global Food-commodity Prices. In C. Taylor, R. Lomneth, F. Wood-Black (Eds.) *Perspectives on Biofuels: Potential Benefits and Possible Pitfalls*, American Chemical Society

G. Hochman, D. Rajagopal and D. Zilberman (2011) Biofuels and Climate Change. In Robert Mendelsohn and Ariel Dinar (Eds.), *Handbook On Climate Change And Agriculture*, Edward Elgar Publishing

OTHER
PUBLICATIONS

G. Hochman, D. Rajagopal and D. Zilberman (2011) OPEC and the Environmental Impact of Biofuels, *Agricultural and Resource Economics Update* 15(2):9-11, published by Giannini Foundation of Agricultural Economics

D. Rajagopal, G. Hochman and D. Zilberman (2010). Lifecycle based regulation of fuels: A Rube Goldberg Contraption of Climate policy *USAE Dialogue*, United States Association for Energy Economics, Vol. 18, No. 1, March 2010

D. Zilberman, G. Hochman, and D. Rajagopal (2010): Indirect Land Use: One Consideration Too Many in Biofuel Regulation, *Agricultural and Resource Economics Update* 13(4):1-4, published by Giannini Foundation of Agricultural Economics

D. Rajagopal and D. Zilberman (2008).The Use of Environmental Lifecycle analysis for evaluating biofuels. *Agricultural and Resource Economics Update*, 11(3) published by Giannini Foundation of Agricultural Economics

S. Sexton, D. Rajagopal, D. Zilberman, and G. Hochman (2008) Food versus Fuel: How biofuels make food more costly and gasoline cheaper. *Agricultural and Resource Economics Update*, 12(1) published by Giannini Foundation of Agricultural Economics

S. Sexton, D. Rajagopal, D. Zilberman, and D. W. Roland-Holst (2007) The Intersection of Energy and Agriculture: Implications of Rising Demand for Biofuel and the Search for the Next Generation. *Agricultural and Resource Economics Update*, 10(5), published by Giannini Foundation of Agricultural Economics

CONFERENCE
PRESENTATIONS

D. Rajagopal and D. Simon: The Effect of Emissions Intensity Regulation on Greenhouse Gas Emissions: Evidence from Alberta", Divisional Paper session at *Academy of Management Meeting*, Atlanta, August 4-8, 2017

D. Rajagopal and D. Simon: Facility Emissions under Emissions Intensity Regulation: Evidence from Alberta's Specified Gas Emitters Regulation, *American Agricultural Economics Association Annual Conference*, Chicago, July 31-Aug 2, 2017

D. Rajagopal: The use of life cycle assessment for measuring and regulating greenhouse gas benefits of biofuels, *American Agricultural Economics Association Annual Conference*, Chicago, July 31–Aug 2, 2017

D. Rajagopal: Heuristics for a simple and transparent Consequential LCA. *Science in Support of Sustainable and Resilient Communities - Conference of the International Society for Industrial Ecology (ISIE) and International Symposium on Sustainable Systems and Technology (ISSST)* Chicago, June 25-29, 2017

D. Rajagopal: LCA-based fuel and environmental regulation: Lessons from RFS and LCFS. *Science in Support of Sustainable and Resilient Communities - Conference of the International Society for Industrial Ecology (ISIE) and International Symposium on Sustainable Systems and Technology (ISSST)* Chicago, June 25-29, 2017

D. Rajagopal: The benefits and costs of regulating life cycle emissions: Lessons from the biofuel experience, *Annual Conference and Meeting of the Society for Benefit-Cost Analysis*, Washington D.C., Mar 13-17, 2017¹

D. Rajagopal: Ride-sharing and Transportation Sustainability. Earth Now, Earth 2050 Symposium. Eight scientific visions for a thriving planet, UCLA Lakretz Conference Center, Oct 18-20 2016

D. Rajagopal, R.Weldzius and J. Ifft: Land Use Impacts of the Renewable Fuel Standard: Evidence from changes in the Conservation Reserve Program Enrollment. *American Agricultural Economics Association Annual Conference*, Boston, July 31–Aug 2, 2016

D. Rajagopal: Heuristic approaches to determine vulnerability of new technologies to market-mediated effects, *International Society for Ecological Economics*², Washington DC, June 26–29, 2016

D. Rajagopal: Heuristic approaches to determine vulnerability of new technologies to market-mediated effects, *Poster presentation* at Gordon Research Conference Industrial Ecology, Stowe, Vermont, June 19–24, 2016

D. Rajagopal, R.Weldzius and J. Ifft: Land Use Impacts of the Renewable Fuel Standard: Evidence from changes in the Conservation Reserve Program Enrollment. Association of Environmental and Resource Economists (AERE) Summer Conference, Colorado, June 9 –11, 2016

D. Rajagopal and M. Accordino. Shale, Biofuel and OPEC Heartland Environmental Economics Workshop, University of Illinois, Urbana Champaign, October 18-19, 2016

D. Rajagopal. The Political Economy of Emission Intensity Standards: An Assessment of Alberta’s Specified Gas Emitters Regulation. Accepted to *World Congress of Environmental and Resource Economists*, Istanbul, Turkey, June 27-30, 2014

D. Rajagopal. Tradable emission performance standards for reducing GHG emissions: Evidence from Alberta’s Specified Gas Emitters Regulation. *Western Economic Association International, 88th Annual Conference*, Seattle, June 28-July 2, 2013

Megan H. Accordino and D. Rajagopal. Why a National Cap-and-Trade Policy with

¹This paper was accepted but I withdrew to participate in a review panel

²Accepted but withdrawn due to scheduling conflict

a Carve-out Provision May Be Preferable to a National CO₂ tax. *Western Economic Association International, 88th Annual Conference*, Seattle, June 28-July 2, 2013

Megan H. Accordino and D. Rajagopal : Comparing Renewable Portfolio Standards, Emission Intensity Standards and Pollution Taxes in the Electricity Sector. *31th United States Association of Energy Economics conference* at Austin, Texas, November 4-7, 2012

D. Rajagopal, G. Hochman and D. Zilberman: Multi-criteria comparison of fuel policies: Renewable fuel mandate, emission standards, and GHG tax. *19th Annual Conference of the European Association of Environmental and Resource Economists* at Prague, Czech Republic, June 27-30, 2012

D. Rajagopal. Prices vs quantities in the context of Lifecycle assessment based regulations. *Summer Conference of Association of Environmental and Resource Economists* at Seattle, June 8–10 2011

D. Rajagopal. Acreage expansion due to corn ethanol: What historical experience suggests. *4th UC Berkeley Bio-economy Conference* at UC Berkeley, March 24–25, 2011

D. Rajagopal, G. Hochman and D. Zilberman. Domestic policies for global externalities: Technology mandates versus performance standards in the transportation sector. *4th World Congress of Environmental and Resource Economists* University of Quebec, Montreal, June 28-July 2nd, 2010.

D. Rajagopal Policy objectives and policy choices. *3rd UC Berkeley Bio-economy Conference* Berkeley, California, May 7–10, 2010

G. Hochman, D. Rajagopal, and D. Zilberman. A Technological Response to Environmental Policy: From Putty-Clay to Putty-Doh. *4th World Congress of Environmental and Resource Economists*, University du Quebec, Montreal. June 28th -July 2nd, 2010.

D. Rajagopal Cleaning up transportation: Clean fuel mandate versus emission standard. *32th International Association of Energy Economics conference* at San Francisco, California, June 21–24, 2009

D. Rajagopal A simple framework for regulation of greenhouse gases from biofuels. *28th United States Association of Energy Economics conference* at New Orleans, Louisiana, December 2–5, 2008

D. Rajagopal. Regulation of greenhouse gas emissions from biofuels. Presented at *Farm Foundation and USDA Conference on Transition to a bioeconomy: Environment and Rural Development Impacts* at St. Louis, Missouri, October 15–16 2008

D. Rajagopal. Prices, Policies and Environmental Lifecycle Analysis of Energy *AERE session of the 2008 Joint Annual Meeting American Association of Agricultural Economics and American Council on Consumer Interests* at Orlando, Florida, July 2008

D. Rajagopal and D. Zilberman (2008). Environmental Lifecycle Assessment for Policy Decision-Making and Analysis *Proceedings of a conference on Lifecycle Carbon Footprint of Biofuels* Edited by Joe L. Outlaw and David P. Ernstes January 29, 2008, Miami Beach, Florida .

D. Rajagopal. Rethinking current strategies for biofuel production in India. *International Conference on Linkages in Water and Energy in Developing Countries*. Conference organized by IWMI, FAO and ICRISAT at Hyderabad, India January 2007

A Mixed Integer Programming Formulation for Generating Shared Press-Brake Setups. *ASME Design for Manufacturing Conference*, Pittsburgh, September 2001

INVITED
WORKSHOPS AND
PANELS

University of Minnesota, NSF-RCN Interdisciplinary Urban Sustainability Careers, Aug 2017

USDA and National Institute of Food and Agriculture, LCA expert on review panel, Feb and Mar 2017

Special panel on Environmental and Energy Policy, 13th Western Economics Association International (WEAI) Conference, Santiago, Chile, January 3-6, 2017 *Invited but declined for family reasons*

German American Energy Forum Panel, *Sustainable Energy - The Path to our Energy Future* held at the, 555 Pennsylvania Avenue, Washington, DC, October 14th, 2010

Food and Agriculture Organization, 1st FAO BEFSCI technical consultation on Criteria and Indicators on Sustainable Bioenergy Production that Safeguards Food Security, to be held at FAO headquarters in Rome, Italy between November 2nd -4th, 2009 - *Invited but declined due to scheduling conflict*

International Workshop on *The Economics of Biofuels* organized by Low Carbon Programme, a Joint Programme on Energy and Climate by Fundacin Repsol, the University of the Basque Country and the Basque Centre for Climate Change (BC3), September 19th, 2013, Bilbao, Spain - *Invited but scheduling conflict*

California State University, Sacramento, Ethical implications of the interconnection between food, energy and development policies, at the Ethics of Food symposium to be held on November 9-10th, 2009 - *Invited but scheduling conflict*

German National Committee for Scientific Committee on Problems of the Environment - A workshop on *Biofuels: Environmental Consequences and Interactions with Changing LandUse* held at Gummersbach, Germany, September 22th to 25th 2008 - *Invited but could not attend*

EXTERNAL
SEMINARS

University of California, Davis, Institute of Transportation Studies Seminar, Jun 2, 2017

University of California, Berkeley, Energy and Resources Group Colloquium, Nov 9, 2016

Stanford University, Atmosphere and Energy Seminar, Department of Civil and Environmental Engineering, Nov 8, 2016

University of Illinois - Urbana Champaign, Department of Agricultural and Consumer Economics, Sep 12, 2016

Carnegie Mellon University, Engineering and Public policy and Civil and Environmental Engineering Seminar, Aug-24-2016

Purdue University, Department of Agricultural Economics Seminar, Feb-12-2016

Iowa State University, Experimental Program to Stimulate Competitive Research (EP-SCOR) Energy Policy Seminar Series, Sep-11-2014

Rutgers University, Department of Agriculture, Food, and Resource Economics Seminar, May-02-2014

University of Illinois, Urbana-Champaign, Department of Agricultural and Consumer Economics, Apr-15-2014

University of California San Diego, Environmental Economics Seminar, Department of Economics, Jan-28-2013

Lawrence Berkeley National Laboratory, Berkeley, Economics of lifecycle analysis and greenhouse gas regulation of fuels, Seminar of the Energy and Environmental Technologies Division, May 28th, 2009

TEACHING

Energy, Environment and Development (Env157)

Lifecycle assessment (Env159)

Environmental Science Practicum (Env180)

Tools for Sustainability Assessment (Env250 - graduate class)