Curriculum Vitae January 2017

Steven K. Rose, Ph.D.

Senior Research Economist and Technical Executive, Energy and Environmental Analysis Research Group Electric Power Research Institute (EPRI) 1325 G Street NW, Suite 1080; Washington, DC 20005 202-293-6183 <u>srose@epri.com</u>

Current positions

- Senior Research Economist and Technical Executive, Energy and Environmental Analysis Research Group, Electric Power Research Institute (EPRI), Oct 2008 – present.
- Appointed Committee Member, Committee on Assessing Approaches to Updating the Social Cost of Carbon, The National Academies of Sciences, Engineering, and Medicine, 2015 present.
- **Expert Panelist**, EPA's Science Advisory Board Biogenic Carbon Emissions Panel, reviewed EPA's initial and revised biogenic carbon emissions accounting frameworks, 2011 2012 and 2014 present.
- **Co-Chair**, Bioenergy and Land Modeling Subgroup, Stanford University's Energy Modeling Forum, 2005 present.

Expert, U.S. Carbon Cycle Scientific Steering Group, U.S. Carbon Cycle Science Program, 2011 – present. **Deputy Associate Editor**, *Climatic Change*, current.

Additional professional responsibilities and honors

Scientific Steering Committee, Integrated Assessment Modeling Consortium, 2009 – present. Graduate Faculty, Department of Economics, Purdue University, Special appointment 2008 – 2013. Lead Author, Climate Change Impacts in the United States: The Third National Climate Assessment. Lead Author, IPCC 4th and 5th Climate Change Assessments of Working Group III.

- Contributing Author, IPCC 4th and 5th Climate Change Assessments of Working Group III.
- Research Fellow, Global Trade Analysis Project (GTAP), 2008-2011, Purdue University.
- Board Member, Global Trade Analysis Project (GTAP), Purdue University, 2009 2015.

Co-winner 2008 Nobel Peace Prize, IPCC Lead Author

- **2008 Outstanding Article of the Year**, *Choices Magazine*, peer reviewed magazine of the Agricultural & Applied Economics Association
- **Technical Expert**, Member of the U.S. Delegation, IPCC Working Group III, Fourth Assessment Report Approval Meeting, Bangkok, Thailand, 2007.
- Expert, U.S. Government Review Panel, IPCC Fourth Assessment Report, Working Groups II and III and Synthesis Report.
- **Guest Editor**, *Environment and Development Economics*, Special Issue on Reduced Emissions from Deforestation and Forest Degradation, 2010 11.

Education

- Ph.D., Economics, Cornell University, 2000
 - Major Field: Environmental and Natural Resource Economics
 - Minor Fields: Applied econometrics and mathematical programming, microeconomics, experimental economics, and development economics
- B.A., Economics with Mathematical Emphasis, honors distinction, Univ. of Wisconsin-Madison, 1989
 Minor Fields: Mathematics, econometrics, computer science, liberal arts studies
 Honors: Phi Beta Kappa, Phi Kappa Phi, Dean's List, Omicron Delta Epsilon

Publications

- Expert Committee Member and Author, 2017. National Academies of Sciences, Engineering, and Medicine. Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide. Committee on Assessing Approaches to Updating the Social Cost of Carbon, Board on Environmental Change and Society, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press. doi: 10.17226/24651.
- Rose, S.K. D. Diaz, G. Blanford, in review. Understanding the Social Cost of Carbon: A Diagnostic and Intercomparison of the US Government Modeling.
- Rose, S.K., R. Richels, G. Blanford, T. Rutherford, in review. The Paris Agreement and Next Steps in Limiting Global Warming. [Discussion Paper – EPRI Report #3002007427, <u>http://epri.co/3002007427</u>]
- Rose, S.K., J. Petrusa, L. Davis, in review. Regional Non-CO₂ Greenhouse Gas Abatement Potential in the United States to 2030. [Discussion Paper EPRI Report #3002001675, <u>http://epri.co/3002001675</u>]
- Expert Committee Member and Author, 2016. National Academies of Sciences, Engineering, and Medicine. Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update. Committee on Assessing Approaches to Updating the Social Cost of Carbon, Board on Environmental Change and Society. Washington, DC: The National Academies Press. doi: 10.17226/21898.
- Contributing Author, 2016. Forestry for a low-carbon future: Integrating forests and wood products in climate change strategies. Food and Agriculture Organization of the United Nations.
- Rose, S., 2016. Estimating Benefits of Reducing Greenhouse Gas Emissions. *Public Utilities Fortnightly* (August): 52-55.
- Rose, S and J. Bistline, 2016. *Applying the Social Cost of Carbon: Technical Considerations*. EPRI, Palo Alto, CA. Report #3002004659, <u>http://epri.co/3002004659</u>.
- Rose, S.K., 2016. "The Paris Agreement on Climate Change: What Countries Have Committed To and Implications for the Electric Sector." *EPRI Quick Insights*, February.
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- Rose, S.K., R. Beach, K. Calvin, B. McCarl, J. Petrusa, B. Sohngen, R. Youngman, A. Diamant, F. de la Chesnaye, J. Edmonds, R. Rosenzweig, M. Wise, in press. *Market Realities for Global Mitigation Supplies: Accounting for Risks and Incentives*. Report #1025510.
- Calvin, K., S. Rose, M. Wise, H. McJeon, L. Clarke, J. Edmonds, 2015. Global climate, energy, and economic implications of international energy offsets programs. *Climatic Change* 133(4): 583–596.
- Blanford, G., D. Diaz, R. Richels, S. Rose, T. Rutherford, 2015. *CO*₂ *Mitigation for Climate Risk Management*. EPRI, Palo Alto, CA. Report #3002005831, <u>http://epri.co/3002005831</u>.
- Richels, R. and S. Rose, 2015. Value of International Emissions Trading Partnerships, *GHG Market Report 2015*, <u>http://www.ieta.org/ghgmarket2015</u>.
- Rose, S.K., 2015. The Inevitability of Climate Adaptation in U.S. Agriculture. *Choices* 30(2) [Journal of the Agriculture and Applied Economics Association].
- Rose, S.K. D. Turner, G. Blanford, J. Bistline, F. de la Chesnaye, and T. Wilson, 2014. *Understanding the Social Cost of Carbon: A Technical Assessment*. EPRI, Palo Alto, CA. Report #3002004657, <u>http://epri.co/3002004657</u>.
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- Contributing Author, 2014. Agriculture, Forestry and Other Land Use (AFOLU) (Chapter 11), *Climate Change 2014: Mitigation of Climate Change*. Fifth Assessment Report, Mitigation Working Group (Working Group III), Intergovernmental Panel on Climate Change (IPCC), www.ipcc.ch.
- Contributing Author, 2014. Drivers, Trends, and Mitigation (Chapter 5), *Climate Change 2014: Mitigation of Climate Change*. Fifth Assessment Report, Mitigation Working Group (Working Group III), Intergovernmental Panel on Climate Change (IPCC), www.ipcc.ch.
- Lead Author, 2014. Energy, Water, and Land Use (Chapter 10). *Climate Change Impacts in the United States: The Third National Climate Assessment*, U.S. Global Change Research Program, 257-281. doi:10.7930/J0JW8BSF.
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- Hibbard, K., A. Janetos, D.P. van Vuuren, J. Pongratz, S.K. Rose, R. Betts, M. Herold, and J.J. Feddema, 2010. "Research Priorities in Land Use and Land Cover Change for Earth System and Integrated Assessment Modeling," *International Journal of Climatology* 30 (13): 2118–2128.
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Working papers/work in progress

Rose, S.K., "Managing Climate Damages: Exploring Potential Trade-offs"

- Rose, S.K., Richels, R., G. Blanford, T. Rutherford, "The Potential Value of International Emissions Trading Partnerships."
- Blanford, G., R. Mendelsohn, S. Rose, "The Price of a Degree: Marginal Mitigation Costs of Limiting Long-Term Temperature Increase."
- Rose, S.K., B. McCarl, G. Latta, "Biomass supply for power & environmental implications."
- Anthoff, D., S. Rose, R.S.J. Tol, and S. Waldhoff, "Regional and Sectoral Estimates of the Social Cost of Carbon: An Application of FUND," ESRI Working Paper No. 375, http://www.esri.ie/UserFiles/publications/WP375/WP375.pdf.
- Anthoff, D., S. Rose, R.S.J. Tol, S. Waldhoff, "The Time Evolution of the Social Cost of Carbon: An Application of FUND," ESRI Working Paper 405, http://www.esri.ie/UserFiles/publications/WP405/WP405.pdf.
- Rose, S.K., A. Golub, B. Sohngen, T. Hertel, "Agricultural impacts of reduced tropical deforestation (RED)."
- Rose, S.K., S. Finn, E. Scheele, J. Mangino, K. Delhotal, J. Siedenburg, and H. Perez. "Detailed non-CO₂ and non-fossil fuel combustion CO2 greenhouse gas emissions data for global economic modeling."
- Golub, A., T. Hertel, S. Rose, B. Sohngen, "Global interactions between bioenergy and climate policies."
- Kim, Y., B. Sohngen, A. Golub, T. Hertel, S. Rose, "Impact of US and European Biofuel Policies on Forest Carbon."
- Rose, S., R.H. Beach, C. Li, W. Salas. "Modeling marginal abatement cost curves for agricultural GHG emissions when producers adopt multiple mitigation options."

Selection of recent presentations

- Rose, S., "A Carbon Tax and the Social Cost of Carbon," Harvard Electricity Policy Group, 85th Plenary Session, December 8-9, 2016.
- Rose, S., "What is the Real Cost of Carbon? Social Cost of Carbon Modeling, Use, & Future," EPRI Web Course, November 17, 2016.
- Rose, S., "What is the Real Cost of Carbon? Understanding the Social Cost of Carbon," EPRI Web Course, November 11, 2016.
- Rose, S., "Insights for Emissions Trading Partnerships," IEA-IETA-EPRI Annual Workshop on GHG Emissions Trading, OECD, Paris, October 19, 2016.
- Rose, S., "Limiting Global Warming: Sizing Up the Ambition and Challenge," Rutgers Energy Institute Policy Seminar Series, Rutgers University, September 9, 2016.
- Rose, S., "Managing Climate Damages: Exploring Potential Trade-offs," International Energy Workshop, University College Cork, Ireland, June 3, 2016.
- Rose, S., "Energy Research and the Road From Paris," International Energy Workshop, University College Cork, Ireland, June 2, 2016.
- Rose, S., "Challenges and Opportunities on the Road Forward from the Paris Climate Agreement," ENV-VISION Conference, Washington, DC, May 11, 2016.
- Rose, S., "Calculating the Social Cost of Carbon: A Detailed Perspective," Climate Action 2016 Forum, University of Maryland, May 4, 2016.
- Rose, S., "The Paris Climate Agreement Implementation and States," Women's Council on Energy and the Environment Washington, DC, April 29, 2016.
- Rose, S., "Challenges and Opportunities on the Road From Paris," NARUC Winter Meeting, Washington, DC, February 16, 2016.
- Rose, S., "Characterizing & Advancing Understanding of the Social Cost of Carbon: Deconstructing the Modeling," Center for Climate and Energy Decision Making, Carnegie Mellon University, February 8, 2016.
- Rose, S., "The Road From Paris: Current and Future Pledges, Global Temperatures, and The Potential Value of International Emissions Trading Partnerships," UNFCCC COP-21, Le Bourget, France, December 10, 2015.
- Rose, S., "Characterizing & Advancing Understanding of the Social Cost of Carbon," UNFCCC COP-21, Le Bourget, France, December 2, 2015.
- Rose, S., "Mitigating and Adapting to Climate Change in Nebraska An Energy Perspective," invited, University of Nebraska-Lincoln Energy Roundtable, October 22, 2015.
- Rose, S., "Important Frontiers for Climate Change Economics," invited, Research Frontiers in the Economics of Climate Change, Stanford University, October 10, 2015.
- Rose, S., "Perspectives on Policies to Implement the COP-21 Paris Agreement," invited, World Energy Council North America Regional Energy Forum, October 8, 2015.
- Rose, S., Exploring the Potential for International Mitigation 'Clubs' for the Road from Paris," invited, 15th IEA-IETA-EPRI Annual Workshop on Greenhouse Gas Emission Trading, Paris, France, September 29, 2015.
- Rose, S., "Understanding Integrated Assessment Modeling of the Social Cost of Carbon," invited, Committee on Assessing Approaches to Updating the Social Cost of Carbon, National Academies of Sciences, Engineering, and Medicine, September 2, 2015.
- Rose, S., "Understanding the Social Cost of Carbon: A Technical Assessment—Carbon Cycle and Climate Modeling," invited, US CCSSG 30th Meeting, May 27, 2015.
- Rose, S., "Measuring the Benefits of GHG Emissions Reductions: The Social Cost of Carbon," ENV-VISION Conference, Crystal City, VA, May 12, 2015.

- Rose, S., "Global Bioenergy Potential in Long-run Energy System Transformation and Climate Management," invited, Berkeley Bioeconomy Conference, University of California – Berkeley, April 1, 2015.
- Rose, S., "A Technical Assessment of Aggregate Climate Damage Functions and Future Needs," invited, Global Climate Risk Forum, European Commission JRC-IPTS, December 1-2, 2014.
- Rose, S., "Clean Power Plan Proposal Climate (CO₂) Benefits," invited, Resource for the Future/EPRI Webinar, December 16, 2014.
- Rose, S., "Understanding the Social Cost of Carbon: A Technical Assessment," invited, U.S. Energy Association, December 8, 2014.
- Rose, S., "Bioenergy in Energy Transformation and Climate Management," invited, EPA Office of Transportation and Air Quality, November 7, 2014.
- Rose, S. et al., "Market Realities for Global Mitigation Supply: Accounting for Investment Risks," Integrated Assessment Modeling Consortium Annual Meeting, College Park, Maryland, November 17, 2014.

Selection of other professional experience

Advisory Board, International Council on Clean Transportation Study on Indirect Land-use Change, 2011. Expert Panel, Council on Sustainable Biomass Production Biofuel and Biopower Greenhouse Gas Standards, 2010.

Steering Committee, Workshops of the Forestry and Agriculture Greeenhouse Gas Modeling Forum.

- **Expert Reviewer**, U.S. Climate Action Report 2010, Fifth National Communication of the United States of America Under the United Nations Framework Convention on Climate Change, 2010.
- **Expert Peer Reviewer**, IPCC Fourth Assessment Report of Working Group II (Climate Change Impacts) and Working Group III (Mitigation). 2005-2007
- **Federal Advisor**, Climate Change Science Program (CCSP) Synthesis and Assessment Product 2.1B: Global Change Scenarios: Their Development and Use. Spring 2006 – Winter 2006
- **Expert Peer Reviewer**, CCSP Synthesis and Assessment Product 2.1A: Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations. 2006-2007
- Senior Research Economist, U.S. Environment Protection Agency, Office of Air and Radiation, Office of Atmospheric Programs, Climate Change Division, Oct 2003 Oct 2008.

Economist, The CNA Corporation, Environment Program, Resource Analysis Division, June 2001 – Oct 2003.

- Assistant Professor, Joint appointments in the Departments of Economics and Environmental Studies, Washington College, Chestertown, MD, August 2000 June 2001.
- **Researcher**, Hatch Research Project, Cornell University, Ithaca, New York, 1999. "Public Forest Land Allocation: A Dynamic Spatial Perspective on Environmental Timber Management."

Consulting Economist, The World Bank Group—Special Programs, 1998.

Resource Economist, USAID via Management Systems International, Inc., Washington DC, 1998.

Journal referee – Review of Environmental Economics and Policy, Ecological Economics, Energy Economics, Energy Journal, Climatic Change, Environment and Development Economics, Climate Policy, Environmental Research Letters, Human-Induced Climate Change: An Interdisciplinary Assessment (book), Mitigation and Adaptation Strategies for Global Change, Technological Forecasting and Social Change, Society and Natural Resources.