

RICHARD G. NEWELL

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EDUCATION

Ph.D., Harvard University, Public Policy (Environmental and Resource Economics)	1997
M.P.A., Princeton University, Woodrow Wilson School, Public Policy	1990
B.S., Rutgers University, College of Engineering, Materials Engineering, Tau Beta Pi	1988
B.A., Rutgers University, Rutgers College, Philosophy, Phi Beta Kappa	1988

PROFESSIONAL POSITIONS

President and CEO, Resources for the Future, Washington, DC	2016–present
Adjunct Professor, Nicholas School of the Environment, Duke University, Durham, NC	2016–present
Administrator, U.S. Energy Information Administration, US Department of Energy, Washington, DC	2009–2011
Gendell Professor of Energy and Environmental Economics, Nicholas School of the Environment, Duke University, Durham, NC	2007–2016
Professor of Economics, Department of Economics, Duke University	2011–2016
Professor of Public Policy, Sanford School of Public Policy, Duke University	2013–2016
Director, Duke University Energy Initiative, Duke University	2011–2016
Director, Energy Data Analytics Lab, Duke University	2014–2016
Senior Economist for Energy and Environment, President’s Council of Economic Advisers, Executive Office of the President, Washington, DC	2005–2006
Senior Fellow, Resources for the Future, Washington, DC	1997–2006
Ian Axford Fellow, New Zealand Fulbright Program, Wellington, New Zealand	2004
Teaching Fellow, Harvard University, Cambridge, MA	1993–1997
Senior Associate, ICF Incorporated, Fairfax, VA	1990–1993

PROFESSIONAL AFFILIATIONS

Member, Board of Directors, Resources for the Future, Washington, DC	2011–present
Member, Executive Council, RFF-CMCC European Institute on Economics and the Environment, Milan, Italy	2018–present
Member, Board on Environmental Change and Society, National Academy of Sciences, Washington, DC	2014–present
Member, American Economics Association	1995–present
Member, Association of Environmental and Resource Economists	1995–present
Member, U.S. Association for Energy Economics	1995–present
Member, Steering Committee, National Petroleum Council, Study on Carbon Capture and Storage, Washington, DC	2019–2020
Member, Steering Committee, National Petroleum Council, Study on Energy Infrastructure, Washington, DC	2018–2020

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Member, International Advisory Council, King Abdullah Petroleum Studies and Research Center, Riyadh, Saudi Arabia	2015–2019
Member, Cochairs’ Coordinating Committee, National Petroleum Council, US Department of Energy, Washington, DC	2016–2018
Member, External Advisory Board, Center for Urban Science and Progress, NYU, NY	2015–2018
Member, External Review Committee, Center for Urban Science and Progress, NYU, NY	2017
Research Associate, National Bureau of Economic Research	2008–2017
Co-Editor, <i>Review of Environmental Economics and Policy</i>	2013–2017
Associate Editor, <i>Journal of Economic Perspectives</i>	2014–2017
Chair, Committee on Assessing Approaches to Updating the Social Cost of Carbon, National Academy of Sciences, Washington, DC	2015–2017
Member, North Carolina Energy Policy Council, Raleigh, NC	2013–2015
University Fellow, Resources for the Future, Washington, DC	2007–2016
Vice President, Association of Environmental and Resource Economists (AERE)	2013–2015
Member, Policy Roundtable of the Behavioral and Social Sciences, National Academy of Sciences, Washington, DC	2013–2015
Member, Study Committee, American Academy of Arts and Sciences Project on the Alternative Energy Future	2011–2014
Contributing Author, IPCC Fifth Assessment Report, Working Group III	2011–2014
Lead Author, US National Climate Assessment, Effects on Energy Production	2011–2014
Member, Editorial Board, <i>Review of Environmental Economics and Policy</i>	2011–2013
Member, Coordinating Sub-Committee, National Petroleum Council (NPC) Study on the Future of Transportation Fuels, Washington, DC	2010–2012
Member, Coordinating Sub-Committee, NPC Study on North American Resource Development, Washington, DC	2010–2011
Member, Steering Committee, Quadrennial Energy Technology Review, US Department of Energy, Washington, DC	2010–2011
Committee on Energy Externalities, National Academy of Sciences	2008–2009
Board Member, Association of Environmental and Resource Economists (AERE)	2008–2009
Advisory Board, Princeton Carbon Mitigation Initiative, Princeton University, Princeton, NJ	2007–2009
Editorial Council, <i>Journal of Environmental Economics and Management</i>	2007–2009
Advisory Board, Progressive Automotive X-Prize	2006–2009
Editorial Board, <i>Energy Economics</i>	2003–2009
Affiliate, Motu Economic and Public Policy Research, Wellington, New Zealand	2003–2009
Advisory Board, Study on the Energy Efficiency Potential of the Appalachian Region	2007–2009
Chair, Workshop on the Economics of Climate Change, National Academy of Sciences	2008
Committee on Energy Efficiency Standards, National Academy of Sciences	2007–2009
Committee on Geopolitics & Policy, NPC Global Oil & Gas Study	2006–2007
Committee on NSF Innovation Inducement Prizes, National Academy of Sciences	2006–2007
Committee on the Benefits of Energy R&D, National Academy of Sciences	2005–2007

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PUBLICATIONS

Journal Articles

- Newell, R.G., B.C. Prest, and S.E. Sexton. In press. The GDP temperature relationship: Implications for climate change damages. *Journal of Environmental Economics and Management*. Prepublication version available as [RFF Working Paper 18-17](#).
- Newell, R.G., W.A. Pizer, and D. Raimi. 2019. U.S. federal government subsidies for clean energy: Design choices and implications. *Energy Economics* 80:831-841. <https://doi.org/10.1016/j.eneco.2019.02.018>.
- Newell, R.G. and B.C. Prest. 2019. The unconventional oil supply boom: Aggregate price response from microdata. *The Energy Journal* 40(3):1-30. [10.5547/01956574.40.3.rnew](https://doi.org/10.5547/01956574.40.3.rnew). Prepublication versions available as [RFF Working Paper 17-15](#) and [NBER Working Paper 23973](#).
- Cao, J., M.S. Ho, Yating Li, R.G. Newell, and W.A. Pizer. 2019. Chinese residential electricity consumption estimation and forecast using micro-data. *Resource and Energy Economics* 56:6-27. <https://dx.doi.org/10.1016/j.reseneeco.2017.10.003>
- Newell, R.G., B. Prest, and A. Vissing. 2019. Trophy hunting vs. manufacturing energy: The price-responsiveness of shale gas. *Journal of the Association of Environmental and Resources Economists* 6(2):177-217. <https://doi.org/10.1086/701531>. Prepublication versions available as [RFF Discussion Paper 16-32](#) and [NBER Working Paper 22532](#).
- Newell, R.G. and D. Raimi. 2018. The fiscal impacts of increased U.S. oil and gas development on local governments. *Energy Policy* 117:14-24. <https://dx.doi.org/10.1016/j.enpol.2018.02.042>
- Newell, R.G. and D. Raimi. 2018. US state and local oil and gas revenue sources and uses. *Energy Policy* 112: 12-18. <http://dx.doi.org/10.1016/j.enpol.2017.10.002> Prepublication version available as [RFF Discussion Paper 16-50](#).
- Bielen, D., R.G. Newell, and W.A. Pizer. 2018. Who did the ethanol tax credit benefit? An event analysis of subsidy incidence. *Journal of Public Economics* 161:1-14. <https://dx.doi.org/10.1016/j.jpubeco.2018.03.005> Prepublication versions available as [RFF Working Paper 18-10-REV](#) and [NBER Working Paper 21968](#).
- Gerarden, T.D., R.G. Newell, and R.N. Stavins. 2017. Assessing the energy-efficiency gap. *Journal of Economic Literature* 55(4):1486–1525. <http://dx.doi.org/10.1257/jel.20161360> Prepublication versions available as [RFF Discussion Paper 15-07](#) and [NBER Working Paper 20904](#).
- Fischer, C., L. Preonis, and R.G. Newell. 2017. *Journal of the Association of Environmental and Resources Economists* 4(4):959-984. <http://dx.doi.org/10.1086/692507> Prepublication version available as [RFF Discussion Paper 13-20](#).
- Huang B., M. Knox, K. Bradbury, L. Collins, and R.G. Newell. 2017. Non-intrusive load monitoring system performance over a range of low frequency sampling rates. *2017 IEEE 6th International Conference on Renewable Energy Research and Applications (ICRERA)*, San Diego, CA, 2017, pp. 505-509. <https://dx.doi.org/10.1109/ICRERA.2017.8191111>
- Bradbury, K., Saboo, R., Johnson, T., Malof, J., Devarajan, A., Zhang, W., Collins, L.M., Newell, R.G. 2016. Distributed solar photovoltaic array location and extent dataset for remote sensing object identification. *Scientific Data* 3: 160106. <http://dx.doi.org/10.1038/sdata.2016.106>
- Malof, J., Bradbury, K., Collins, L., and Newell, R. 2016. Automatic detection of solar photovoltaic arrays in high resolution aerial imagery. *Applied Energy* 183:229-240. <http://dx.doi.org/10.1016/j.apenergy.2016.08.191>

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- Malof, J., Serrano, A., Wu, H., Keene, S., Bradbury, K., Collins, L., and Newell, R. 2016. Image features for pixel-wise detection of solar photovoltaic arrays in aerial imagery using a random forest classifier. *2016 IEEE International Conference on Renewable Energy Research and Applications (ICRERA)*, Birmingham, 2016, pp. 799-803. <http://dx.doi.org/10.1109/ICRERA.2016.7884446>
- Malof, J., Bradbury, K., Collins, L., and Newell, R. 2016. A deep convolutional neural networks for solar photovoltaic array detection in aerial imagery. *2016 IEEE International Conference on Renewable Energy Research and Applications (ICRERA)*, Birmingham, 2016, pp. 650-654. <http://dx.doi.org/10.1109/ICRERA.2016.7884415>
- Newell, R.G. and J. Siikamäki. 2015. Individual time preferences and energy efficiency. *American Economic Review* 105(5): 196-200. <http://dx.doi.org/10.1257/aer.p20151010> Prepublication version available as [NBER Working Paper 20969](#).
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- Malof, J., R. Hou, L. Collins, K. Bradbury, R. Newell. 2015. Automatic Solar Photovoltaic Panel Detection in Satellite Imagery. *2015 International Conference on Renewable Energy Research and Applications (ICRERA)*, Palermo, pp. 1428-1431. <http://dx.doi.org/10.1109/ICRERA.2015.7418643>
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- Newell, R.G., W.A. Pizer, and D. Raimi. 2014. Carbon market lessons and global policy outlook. *Science* 343:1316-1317. <http://dx.doi.org/10.1126/science.1246907>
- Newell, R.G., W.A. Pizer, and D. Raimi. 2014. Carbon markets: Effective policy?—Response. *Science* 344(6191):1460-1461. <http://dx.doi.org/10.1126/science.344.6191.1460-c>
- Arrow, K.J., M.L. Cropper, C.G., C. Gollier, B. Groom, G.M. Heal, R.G. Newell, W.D. Nordhaus, R.S. Pindyck, W.A. Pizer, P.R. Portney, T. Sterner, R.S.J. Tol and M.L. Weitzman. 2014. Should governments use a declining discount rate in project analysis? *Review of Environmental Economics and Policy* 8(2):145–163. <http://dx.doi.org/10.1093/reep/reu008>
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- Arrow, K.J., M.L. Cropper, C.G., C. Gollier, B. Groom, G.M. Heal, R.G. Newell, W.D. Nordhaus, R.S. Pindyck, W.A. Pizer, P.R. Portney, T. Sterner, R.S.J. Tol and M.L. Weitzman. 2013. Determining benefits and costs for future generations. *Science* 341:349-350. <http://dx.doi.org/10.1126/science.1235665>
- Newell, R.G., W.A. Pizer, and D. Raimi. 2013. Carbon markets 15 years after Kyoto: Lessons learned, new challenges. *Journal of Economic Perspectives* 27(1):123-146.

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- Arimura, T.H., Li, S., R.G. Newell, and K. Palmer. 2012. Cost-effectiveness of electricity energy efficiency programs. *The Energy Journal* 33(2):63-99. <http://dx.doi.org/10.5547/01956574.33.2.4> Prepublication version available as [RFF Discussion Paper 09-48](#) and [NBER Working Paper 17556](#).
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- Gillingham, K., R.G. Newell, and K. Palmer. 2009. Energy efficiency economics and policy. *Annual Review of Resource Economics* 1: 597-619. <http://dx.doi.org/10.1146/annurev.resource.102308.124234> Prepublication version available as [RFF Discussion Paper 09-13](#) and [NBER Working Paper 15031](#).
- Murray, B., R.G. Newell, and W.A. Pizer. 2009. Balancing cost and emissions certainty: An allowance reserve for cap-and-trade. *Review of Environmental Economics and Policy* 3(1): 84-109. <http://dx.doi.org/10.1093/reep/ren016> Prepublication version available as [RFF Discussion Paper 08-24](#) and [NBER Working Paper 14258](#).
- Eccles, J.K., L. Pratson, R.G. Newell, and R.B. Jackson. 2009. Physical and economic potential of geological CO₂ storage in saline aquifers. *Environmental Science and Technology* 43: 1962-1969. <http://dx.doi.org/10.1021/es801572e>
- Newell, R.G. and W.A. Pizer. 2008. Carbon mitigation costs for the commercial building sector: Discrete-continuous choice analysis of multi-fuel energy demand. *Resource and Energy Economics* 30(4):527-539. <http://dx.doi.org/10.1016/j.reseneeco.2008.09.004> Prepublication version available as [RFF Discussion Paper 05-13](#).
- Newell, R.G. and W.A. Pizer. 2008. Indexed regulation. *Journal of Environmental Economics and Management* 56(3):221-233. <http://dx.doi.org/10.1016/j.jeem.2008.07.001> Prepublication versions available as [RFF Discussion Paper 05-62](#) and [NBER Working Paper 13991](#).
- Gillingham, K., R.G. Newell, and W.A. Pizer. 2008. Modeling endogenous technological change for climate policy analysis. *Energy Economics* 30:2734-2753. <http://dx.doi.org/10.1016/j.eneco.2008.03.001> Prepublication version available as [RFF Discussion Paper 07-14](#).
- Fischer, C. and R.G. Newell. 2008. Environmental and technology policies for climate mitigation. *Journal of Environmental Economics and Management* 55(2):142–162. <http://dx.doi.org/10.1016/j.jeem.2007.11.001> Prepublication version available as [RFF Discussion Paper 04-05](#).
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- <http://dx.doi.org/10.1016/j.enpol.2007.09.030> Prepublication version available as [RFF Discussion Paper 06-50](#).
- Newell, R.G., K.L. Papps, and J.N. Sanchirico. 2007. Asset pricing in created markets. *American Journal of Agricultural Economics* 9(2):259–272. <http://dx.doi.org/10.1111/j.1467-8276.2007.01018.x> Prepublication version available as [RFF Discussion Paper 05-46](#).
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- Gillingham, K., R.G. Newell, and K. Palmer. 2006. Energy efficiency policies: A retrospective examination. *Annual Review of Environment and Resources* 31:161–192. <http://dx.doi.org/10.1146/annurev.energy.31.020105.100157> Prepublication version available as [RFF Discussion Paper 04-19](#).
- Newell, R.G., A.B. Jaffe, and R.N. Stavins. 2006. The effects of economic and policy incentives on carbon mitigation technologies. *Energy Economics* 28(5-6):563–578. <http://dx.doi.org/10.1016/j.eneco.2006.07.004>
- Jaffe, A.B., R.G. Newell, and R.N. Stavins. 2005. A tale of two market failures: Technology and environmental policy. *Ecological Economics* 54:164–174. <http://dx.doi.org/10.1016/j.ecolecon.2004.12.027> Prepublication version available as [RFF Discussion Paper 04-38](#).
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- Newell, R.G., W.A. Pizer, and J. Zhang. 2005. Managing permit markets to stabilize prices. *Environmental and Resource Economics* 31:133–157. <http://dx.doi.org/10.1007/s10640-005-1761-y> Prepublication version available as [RFF Discussion Paper 03-34](#).
- Newell, R.G., J.N. Sanchirico, and S. Kerr. 2005. Fishing quota markets. *Journal of Environmental Economics and Management* 49:437–462. <http://dx.doi.org/10.1016/j.jeem.2004.06.005> Prepublication version available as [RFF Discussion Paper 02-20](#).
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- Anderson, S.T. and R.G. Newell. 2004. Information programs for technology adoption: The case of energy-efficiency audits. *Resource and Energy Economics* 26(1):27–50. <http://dx.doi.org/10.1016/j.reseneeco.2003.07.001> Prepublication versions available as [RFF Working Paper 02-58](#).
- Anderson, S.T. and R.G. Newell. 2004. Prospects for carbon capture and storage technologies. *Annual Review of Environment and Resources* 29:109–142. <http://dx.doi.org/10.1146/annurev.energy.29.082703.145619> Prepublication version available as [RFF Discussion Paper 02-68](#).
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Prepublication version available as [RFF Discussion Paper 99-10-REV](#).
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Books and Book Chapters

- Newell, R.G. 2015. The Role of Energy Technology Policy Alongside Carbon Pricing. In *Implementing a US Carbon Tax*, I. Parry, A. Morris, and R.C. Williams, eds. International Monetary Fund. Washington, DC: Routledge. pp. 178–190.
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PROFESSIONAL ACTIVITIES

Awards

2018 USAEE Adelman-Frankel Award, from the U.S. Association for Energy Economics, for unique and innovative contributions to the field of energy economics.

2017 Publication of Enduring Quality Award, from the Association of Environmental and Resource Economists, for “The Induced Innovation Hypothesis and Energy-Saving Technological Change”, published in the *Quarterly Journal of Economics* in 2002.

2006 Petry Research Prize for the Economics of Climate Change, from the Association of Environmental and Resource Economists, for “Discounting the Distant Future: How Much Do Uncertainty Rates Increase Valuations?”, published in the *Journal of Environmental Economics and Management* in 2003.

Peer review

Regular peer reviewer of journal and book submissions, grant proposals, and conference paper submissions, including for: *American Economic Review*, *American Economic Journal: Economic Policy*, American Agricultural Economics Association, Association of Environmental and Resource Economists, Blackwell Publishers, *Climatic Change*, *Climate Policy*, *Contemporary Economic Policy*, Dutch Social Science Research Council, *Ecological Economics*, *Economic Journal*, *Energy Economics*, *Energy Journal*, *Energy Policy*, *Environment and Development Economics*, *Environmental and Resource Economics*, European Association of Environmental and Resource Economists, Intergovernmental Panel on Climate Change, *Journal of Applied Econometrics*, *Journal of Economic Dynamics and Control*, *Journal of Environmental Economics and Management*, *Journal of Policy Analysis and Management*, *Journal of Public Economics*, NOVA, PNAS, RAND *Journal of Economics*, Research Council of Norway, *Resource and Energy Economics*, RFF Press, *Review of Economic Studies*, *Scandinavian Journal of Economics*, MISTRA Swedish Foundation for Strategic Environmental Research, United Nations University Press, U.S. Department of Energy, U.S. Environmental Protection Agency, U.S. National Science Foundation.

Conference, Workshop, and Seminar Presentation

Regular invited speaker, discussant, and participant at national and international conferences, workshops, and seminars including: American Economic Association meetings, Association of Environmental and Resource Economists meetings, National Bureau of Economic Research meetings (Environmental and Energy Economics, Public Policy and Environment, Innovation Policy and the Economy), European Association of Environmental and Resource Economists meetings, Advanced Research Projects Agency-Energy (ARPA-E, Washington, DC), American Agricultural Economics Association meetings, Aspen Institute Energy Policy Forum (Aspen), Aspen Institute Global Energy Forum (Aspen), Aspen Institute Forum on Shale Gas (Aspen), Atlantic Council (Washington, DC), Autumn Energy Conference (Oslo), Biomass Forum (St. Louis), Brookings Institution (Washington, DC), The Business Council, Carnegie Mellon University, Center for Climate Policy Solutions, CERAWEEK (Houston), Center for Strategic and International studies (Washington, DC), Conference of the Parties to the United Nations Framework Convention on Climate Change (Milan, Bonn, Lima), Dartmouth College, Duke University, Energy Foundation, Energy Modeling Forum, FLAME Natural Gas Conference (Amsterdam), Fondazione Eni Enrico Mattei (Venice, Milan), Free University (Amsterdam), French Institute of International Relations (Paris), Georgetown University, Georgia Tech University, German Federal Ministry of Education and Science (Chiemsee), Harvard University, Harvard Project on International Agreements (Venice), Helsinki School of Economics (Helsinki), International Association for Energy Economics (Rio De Janeiro),

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International Energy Agency (Paris), International Energy Forum (Riyadh), International Institute for Applied Systems Analysis (Laxenburg), Institute for Global Environmental Strategies (Tokyo), Global Industrial and Social Progress Research Institute (Tokyo), International Association of Energy Economists, IPEACA, KAPSARC (Riyadh), London School of Economics, Natural Gas Roundtable, North American Gas Forum (Washington, DC), North Carolina State University, Ocean Law Project, Organization for Economic Cooperation and Development (OECD, Paris), Pew Center on Global Climate Change, Princeton University, Research Triangle Energy Consortium, Resources for the Future, Shanghai Forum (Shanghai), Stanford University, Swedish Foundation for Strategic Environmental Research (Stockholm), U.S. Association for Energy Economics, U.S.-China Strategic and Economic Dialogue, U.S. Department of Energy, U.S. Energy Information Administration, U.S. Environmental Protection Agency, University of California (Berkeley, Irvine, Los Angeles, Santa Barbara), University of Chicago, University of Massachusetts, Texas A&M University, World Energy Congress (Montreal), World Future Energy Summit (Abu Dhabi), World National Oil Companies Congress (London), World National Gas Conference (Buenos Aires), Yale University (New Haven), ZEW (Bonn, Mannheim).

Congressional Testimony

Senate Agriculture, Nutrition, and Forestry Committee <i>Hearing on "Evaluating High Gas Prices and How New Rules and Innovative Farming Can Help"</i>	March 30, 2011
House Natural Resources Committee <i>Hearing on "Harnessing American Resources to Create Jobs and Address Rising Gasoline Prices: Domestic Resources and Economic Impacts"</i>	March 17, 2011
Senate Energy and Natural Resources Committee <i>Briefing on "Oil Markets and the Impacts of Recent Events in the Middle East and North Africa"</i>	March 15, 2011
House Energy and Commerce Committee, Subcommittee on Energy and Power <i>Hearing on "The Effects of Middle East Events on U.S. Energy Markets"</i>	February 10, 2011
Senate Energy and Natural Resources Committee <i>Hearing on "The Energy and Oil Market Outlook for the 112th Congress"</i>	February 3, 2011
Senate Energy and Natural Resources Committee <i>Hearing on "The Role of Natural Gas in Mitigating Climate Change"</i>	October 28, 2009
Senate Energy and Natural Resources Committee <i>Hearing on "Energy and Related Economic Effects of Global Climate Change Legislation"</i>	October 14, 2009
Senate Energy and Natural Resources Committee <i>Confirmation hearing</i>	July 9, 2009