06/18

ROBERT H. SOCOLOW

Office Address: Princeton Environmental Institute
139 Guyot Hall, Washington Road
Princeton University
Princeton, NJ 08544

Office Phone: (609) 258-5446
Fax: (609) 258-7715
Electronic Mail: socolow@princeton.edu
Web Page: https://socolow.princeton.edu/

Home Address: 115 Arreton Road, Princeton, NJ 08540
Home Phone: (609) 688-0112

Education: Harvard University, M.A., 1961 and Ph.D. 1964 (Physics)
Harvard College, B.A. (summa cum laude, Physics), 1959
Fieldston School, New York, NY

Chronology

2014 - present: Professor of Mechanical and Aerospace Engineering, Emeritus; Senior Research Scholar; Lecturer with the rank of Professor in Mechanical and Aerospace Engineering and Freshman Seminars, Princeton University

2013- 2014: Professor of Mechanical and Aerospace Engineering, Emeritus; Senior Research Scholar; and Lecturer with rank of Professor in Public Affairs, Princeton University

1979-2013: Professor, Mechanical and Aerospace Engineering, Princeton University

1979-98: Director, Center for Energy and Environmental Studies (formerly Center for Environmental Studies), Princeton University

1978-79: Professor, Department of Aerospace and Mechanical Sciences; Acting Director, Center for Environmental Studies, Princeton University

1977-78: Professor, Department of Aerospace and Mechanical Sciences; Associate Director, Center for Environmental Studies, Princeton University

1971-77: Associate Professor, Department of Aerospace and Mechanical Sciences; Member, Center for Environmental Studies, Princeton University

1971: Summer: Research Associate, Department of Geology and Geophysics, Yale University

1966-71: Assistant Professor, Department of Physics, Yale University.

1970-71: Yale University Junior Faculty Fellowship

1971: Spring Term: Member, Institute for Advanced Study, Princeton, NJ

1964-66: National Science Foundation Post-doctoral Fellow in Physics, University of California at Berkeley and European Center for Nuclear Research (CERN), Geneva.

1959-60: Frederic Sheldon Travelling Fellowship, Harvard College

Honors and Awards

Member, American Academy of Arts and Sciences, Cambridge, MA, October 11, 2014 Induction

2010 Leadership in the Environment award of the Keystone Center, presented by Congressman Rush Holt at the 2010 Keystone Center Leadership Awards Dinner, Union Station, Washington D.C., June 10, 2010

2009 Frank Kreith Energy Award of the American Society of Mechanical Engineers, presented at the Honors Assembly of the ASME Congress, Orlando, Florida, November 16, 2009

Member, Grand Challenges for Engineering Committee (Convened by the U.S. National Academy of Engineering at the Request of the U.S. National Science Foundation)

Cited for the co-invention of "the Personal Carbon Footprint," listed as Number 12 in "The 50 Best Inventions of 2009," compiled by Time Magazine, Dec. 8, 2009. The Personal Carbon Footprint is *Time*'s restatement of the key idea in Chakravarty et al., PNAS, 2009, namely that carbon accounting should include a focus on individual emissions as a supplement national per capita emissions.

"Innovators: A President, a Banker, and an Eclectic Group of Researchers Tackle Earth's Vexing Issues." (Steve Pacala and Rob Socolow are two of the four in the eclectic group.) *Time Magazine,* April 9, 2007, pp. 63-66.

Axelson Johnson Commemorative Lecture award: For "outstanding research in global carbon management and the hydrogen economy," from the Royal Academy of Engineering Sciences, Sweden (IVA) and the Axel Axelson Johnson Endowment. The award, given every five years, in principle, had last been given in 1995. The inscription on the medal reads: "For a remarkable effort in the application of engineering science research in mankind's service [and] for presenting this to the academy in the Academy in the Axel Axelson Johnson lecture", 2005.

Lifetime National Associate of the National Academy: "In recognition of extraordinary service to the National Academies in its role as advisor to the Nation in matters of science, engineering, and health, by the authority of the Council of the National Academy of Sciences and the Governing Board of the National Research Council," 2004.

The Leo Szilard Lectureship Award, American Physical Society: "For leadership in establishing energy and environmental problems as legitimate research fields for physicists, and for demonstrating that these broadly defined problems can be addressed with the highest scientific standards," 2003.

Fellow, American Association for the Advancement of Science (elected 1990).

Fellow, American Physical Society (elected 1984, nominee of the Forum on Physics and Society).

Guggenheim Fellowship, 1976-77, for study of international energy issues at the Cavendish Laboratory, University of Cambridge, U.K.

German Marshall Fund Fellowship, l976-77, for study of international energy issues at the Cavendish Laboratory, University of Cambridge, U.K.

University Activities

Special Responsibilities in Princeton

Present

Co-Principal Investigator, Carbon Mitigation Initiative, a 20-year (2001-2020) University-wide sponsored research program supported by BP.

Co-organizer (with Melissa Lane and Marc Fleurbaey), Climate Futures Initiative in Science, Values, and Policy, a research initiative sponsored by Princeton Environmental Institute and the University Center for Human Values, 2014-

Organizer, Energy Technology Distillates, a series of energy and environment publications sponsored by the Andlinger Center for Energy and the Environment, 2013-

Head, Princeton Energy and Climate Scholars (PECS), an honor society for graduate students, 2008-

Collaborator, Energy Systems Analysis Group of the Andlinger Center for Energy and the Environment

Teacher, Undergraduate and Graduate Courses, Mechanical and Aerospace Engineering, Woodrow Wilson School of Public and International Affairs, Princeton Environmental Institute, and Freshman Seminars

Associated Faculty, Program in Science, Technology, and Environmental Policy, Woodrow Wilson School of Public and International Affairs

Fellow, Rockefeller College

Past

Member, Princeton Environmental Institute Executive Committee, 1994-2005 and 2007-2016.

Head, Siebel Grand Challenge in Energy, Climate and Security (Princeton Environmental Institute, Woodrow Wilson School, School of Engineering and Applied Science), 2008-2015.

Co-organizer (with Robert Keohane, Melissa Lane, Michael Oppenheimer and Harold Shapiro), Communicating Uncertainty: Science, Institutions, and Ethics in the Politics of Global Climate Change, a 3-year research initiative (2011-2014) sponsored by Princeton Institute for International and Regional Studies.

Co-organizer (with Robert Keohane and Michael Oppenheimer), Climate Change Colloquium for Princeton faculty, Fall 2010.

Member, America's Climate Choices, a Committee of the National Academies, 2008-2010

Member of Planning Group, Initiative on Oil and the Middle East (with Stephen Pacala, Shivaji Sondhi, and Michael Cook).

Participant, workshop on "Science, Democracy, and Global Environmental Regulation," Woodrow Wilson School, May 14-15, 2009. Also, contributor of an informal paper to the workshop, "Science, Democracy, and Geoengineering."

Co-organizer, Ethics and Climate Lecture Series (jointly with the University Center for Human Values), 2008-2009.

Co-convenor (with David Tilman), one-day workshop on the environmental dimensions of biofuels resources, June 2008.

Convener, Princeton Environmental Institute Faculty Lecture Series

Member, Faculty Advisory Committee on Policy, 1999-2001

Member, Council of the Princeton University Community (Executive Committee, 1999, 2001)

Director, Center for Energy and Environmental Studies, 1979-98

Faculty Fellow, Princeton Society of Fellows of the Woodrow Wilson Foundation, 1995-97

Member, Council on Science and Technology, 1991-97

Faculty Advisor, Marshall Scholarship Competition, 1991-97

Boards, Committees, Editorships

Present

Member, Editorial Board, Energy and Environmental Science, a new peer-reviewed journal of the Royal Society of Chemistry, 2007-

Member, Deutsche Bank Climate Change Advisory Board, 2008-

Member, Expert Council, MIT Climate Collaboratorium, 2010-

Member, Strategic Advisory Board, Joint Center for Artificial Photosynthesis (the Department of Energy's new Energy Innovation Hub to Develop Method to Produce Fuels from Sunlight, headed by Nathan Lewis, Cal Tech), 2010-

Member, Centro Euro-Mediterraneo per i Cambiamenti Climatici Scientific Advisory Panel, 2011-

Past

Member, Secretary of Energy Advisory Board Task Force on CO_2 Utilization, requested by the secretary of the U.S. Department of Energy, 2016

Member, Advisory Board, Lawrence Berkeley National Laboratory (LBNL), 2009-2016

Member, Selection Committee, "Climate Change and Urban Resilience," International Center for Climate Governance Awards, 2013

Chair (2012) and Member, Science and Security Board, Bulletin of the Atomic Scientists, 2008-2013

Member, Scientific Advisory Board, Fondazione Eni Enrico Mattei (FEEM), Milan, 2009- 2013

Juror, Heinz Awards Program, Heinz Family Foundation, 2010 and 2011.

Co-chair (with, successively, William Brinkman, Arun Majumdar, and Michael Desmond), Report on the Direct Capture from Air of Carbon Dioxide with Chemicals, Panel on Public Affairs, American Physical Society, 2008-2011

Chair (2010), Panel on Public Affairs (POPA), American Physical Society; Chair-Elect (2009) and Vice-chair (2008)

Member, America's Climate Choices, a Committee on the National Academies, 2008-11

Invited participant, Scoping meeting for the IPCC Fifth Assessment Report (AR5). July 13-17, 2009 Venice, Italy.

Invited participant, Ideas Festival of the Aspen Institute, 2006, 2008, and 2009.

Convenor, Workshop on Nuclear Power and Climate, Princeton University, November 19, 2009.

Member, week-long summer study on aerosol injection into the stratosphere (Steve Koonin, chair; sponsored by Novim, a Santa Barbara CA non-governmental organization), 2008-2009.

Co-convenor (with David Tilman), one-day workshop on the environmental dimensions of biofuels resources, Princeton University, June 2008.

MissionPoint Capital Partners, Scientific Advisor, 2007-2009.

Invited Guest, World Economic Forum, Davos, Switzerland, 2007.

Chair of the Academic Review Panel, "Reducing U.S. Greenhouse Gas Emissions: *How Much at What Cost*?," U.S. Greenhouse Gas Abatement Mapping Initiative, Executive Report, McKinsey & Company, December 2007.

Member, Program Committee, 50th Anniversary of the Global Carbon Dioxide Record, Symposium and Celebration, Kona, Hawaii, 2007.

Member, Program Committee, NETL Meeting: Sixth Annual Conference on Carbon Capture & Sequestration, 2007.

Member, The National Petroleum Council CO_2/Environment committee, contributing to its "Global Oil and Gas Study," requested by the secretary of the U.S. Department of Energy, 2006-2007.

Consultant, Vattenfall and McKinsey "Global Energy Study", 2006.

Convener, International Energy Workshop of the InterAcademy Council, held under the auspices of the Indian National Science Academy, New Delhi, India, May 30-31, 2006.

Consultant, International Energy Agency, assisting in the development of the "Alternative Policy Scenario" presented in the *World Energy Outlook-2006*, 2005-2006

Consultant, World Wildlife Fund, assisting its WWF-wide "Energy Task Force," 2005-2007.

Member, InterAcademy Council committee, charged with conducting an energy study, "Transitions to Sustainable Energy Systems," 2005-2007; coauthored the report, "Lighting the Way: Toward a Sustainable Energy Future."

Member, Steering Committee, U.S. Department of Energy/National Energy Technology Laboratory, Fourth Annual Carbon Capture and Sequestration Conference, May 2005.

Member, Managing Board, *Journal of Industrial Ecology*, 1997-2005.

Member, IIASA Evaluation Committee on Energy and Technology, 2004.

Member, Oxford Commission on Sustainable Consumption, Oxford Centre for the Environment, Ethics and Society, Mansfield College, University of Oxford, 1999-2004.

Contributing Editor, *Environment*, 1999-2007.

Member, Future of Coal subproject, Energy Futures Project, Turner Foundation and U.N. Foundation, 2002-2003.

Member, Environmental Science Advisory Committee, Environmental Defense Fund, 1999-2001.

Member, Editorial Board, *Perspectives in Energy* (Pion).

National Research Council:

Member, America's Climate Choices, National Academy Summit, 2009-2011

Member, America's Energy Future, a Committee of the National Academies, 2007-2009

Member, "Grand Challenges for Engineering committee," National Academy of Engineering, 2006-2009

Member, "National Research Council," Panel on Carbon Sequestration, 2005-2006

Member, Committee on Alternatives and Strategies for Future Hydrogen Production and Use, 2002-2004 (Report 2004)

Member, Committee to Review DOE's Vision 21 R&D Program, 2002 (Report 2002, Report 2004)

Member, Board on Energy and Environmental Systems, 1999-2002

Member, Ecosystems Panel, National Research Council, Washington, DC, 1997-2000

Member, Committee on R&D Opportunities for Advanced Fossil-Fueled Energy Complexes, National Research Council, 1999-2000

Member, Steering Committee, Exploratory Workshop on Earth Systems Engineering, National Academy of Engineering, 2000

Member, Steering Group, Fusion Science Assessment Committee, National Research Council, 1999-2000

Member, Committee on the Human Dimensions of Global Change, National Research Council, 1992-98

Member, Committee for the Study on Transportation and a Sustainable Environment, National Research Council, 1994-97

Member, Board on Global Change, National Research Council, 1993-95

U.S. Department of Energy:

Member, Secretary of Energy Advisory Board Task Force Member, contributing to its report on "CO_2 Utilization and Negative Emissions Technologies," submitted to the Secretary of the U.S. Department of Energy, 2016

Member, Nuclear Energy Research Advisory Committee, U.S. Department of Energy, 1998-2000

Member, Coordinating Committee, Project to prepare the "Working Paper on Carbon Sequestration Science and Technology," U.S. Department of Energy, 1999

Co-chair, Workshop on Technological Opportunities for Fuels Decarbonization and Carbon Sequestration, Washington, DC, sponsored by the U.S. Department of Energy, July 28-29, 1997

Member, Conference Organizing Committee, "Basic Research Needs for Environmentally Responsive Technologies of the Future"; and Chairperson, Cross-Cutting Workshop, "Health, Ecological, and Environmental Impacts." Sponsored by NSF and DOE, New Orleans, January 4-5, 1996

Member, Conference Organizing Committee, "Basic Research Needs for Vehicles of the Future." Sponsored by NSF and DOE, New Orleans, January 5-7, 1995

Editor, *Annual Review of Energy and Environment* (Annual Reviews), 1992-2002; Associate Editor 1988-1992

Member, Science and Policy Program Committee, Second International Nitrogen Conference, 2001, 1999-2002

Member, Editorial Committee for the special issue of *Ambio*, Vol. 31, presenting the edited papers for the Second International Nitrogen Conference, October 14-18, 2001, Potomac, MD, 2002

Member, Advisory Committee for the Foundation's Initiative in the Former Soviet Union, The John D. and Catherine T. MacArthur Foundation, 1993-2001

Member, Board of Directors, National Audubon Society, 1992-1999

Member, Research Planning Committee, International Human Dimensions Program-Industrial Transformation (IHDP-IT) 1997-1999

Member, National Council, Federation of American Scientists, 1995-1999

Member, Project on the Long-Term Future for Nuclear Power, Atlantic Council of the United States, 1997-1999

Member, U.S. Team. Comparative Study of Environment and Development Values, Carnegie Council on Ethics and International Affairs, 1997-1998

Member, World Bank Energy and Environment Steering Committee, 1996-97

Member, Board of Directors, Harvard Club of Princeton, 1995-1997

Member, Panel on Public Affairs (POPA), American Physical Society, 1994-1996

Chairman, Advisory Committee, Environmentally Conscious Design Strategic Initiative Group, National Center for Manufacturing Sciences, Ann Arbor, MI, 1993-1996

Member, Fusion Review Panel, The President's Committee of Advisors on Science and Technology, 1995

Member, U.S. Advisory Group to the U.S. Steering Committee, Project on Energy Policies for the Newly Independent States of the Former Soviet Union, The Atlantic Council, 1993-95

Chairman of the Board, American Council for an Energy-Efficient Economy, 1989-93; founding member, ca. 1980

Director, Global Change Institute, “Industrial Ecology and Global Change,” Snowmass, CO, July 1992

Member, Advisory and Selection Committee, Pew Scholars Program in Conservation and Environment, 1989-92

Member of the Board, American Energy Assurance Council, 1989-92

Member, US-Soviet Committee on Energy Conservation Research and Development, National Academy of Sciences, 1986-89

Member, Editorial Board, *Energy and Buildings* (Elsevier)

Selected Publications

Books

R.H. Socolow, C. Andrews, F. Berkhout, V. Thomas, Ed., *Industrial Ecology and Global Change* (Cambridge University Press, New York, 1994).

R. H. Socolow, Ed., *Saving Energy in the Home: Princeton's Experiments at Twin Rivers* (Ballinger Press, **Pensacola**,1978).

R.H. Socolow, H. Feiveson, F. Sinden, Ed., *Boundaries of Analysis: An Inquiry into the Tocks Island Dam Controversy* (Ballinger Press, **Pensacola**, 1976).

R. H. Socolow, K. Ford, G. Rochlin, M. Ross, Ed., *Efficient Use of Energy* (American Institute of Physics, Melville, NY,1975).

R. H. Socolow, J. Harte, Ed. *Patient Earth*. (Holt, Rinehart, New York, 1971).

Refereed Articles & Book Chapters since 1985

M. Budolfson, F. Dennig, M. Fleurbaey, A. Siebert, and R.H. Socolow, The comparative importance for optimal climate policy of discounting, inequalities, and catastrophes, *Climatic Change*, **145**, 481-494 (2017).

N. Scovronick, M.B. Budolfson, F. Dennig, M. Fleurbay, A. Siebert, R.H. Socolow, D. Spears, and F. Wagner, Impact of population growth and population ethics on climate change mitigation policy, *Proceedings of the National Academy of Sciences*, Early Edition, October 30, 2017.

F. Dennig, M.B. Budolfson, M. Fleurbaey, A. Siebert, R.H. Socolow, Inequality, climate impacts on the future poor, and carbon prices, *Proceedings of the National Academy of Sciences*, **112**, 15827–15832 (2015).

S. J Davis, R.H. Socolow, Commitment accounting of $C0_2$ emissions, *Environmental Research Letters*, **9** (2014).
Featured in Environmental Research Letters' "Ten Milestone Articles," of the special 10th anniversary highlights brochure of the journal.

Mazzotti, M., Baciocchi, R., Desmond, M.J., Socolow, R.H, Direct air capture of CO_2 with chemicals: optimization of a two-loop hydroxide-carbonate system using a countercurrent air-liquid contactor. *Climatic Change*, **118**, 119-135 (2013).

M. Tavoni, R. H. Socolow, Modeling meets science and technology: An introduction to a special issue on negative emissions. *Climatic Change.* **118,** 1-14 (2013).

M. Tavoni, S. Chakravarty, R. H. Socolow, Safe vs. fair: a formidable trade-off in tackling climate change. *Sustainability*. **4**, 210-226 (2012).

R. H. Socolow, High-consequence outcomes and internal disagreements: Tell us more, please. *Climatic Change*. **108**, 775-790 (2011).

R.H. Socolow, M.R. English, in *The Ethics of Global Climate Change*, D.G. Arnold, Ed. (Cambridge, New York, 2011), chap. 8.

R.H. Socolow, A. Glaser, Balancing risks: nuclear energy and climate change. *Dædalus.* **138,** 31-44 (2009).

D. Tilman, R. H. Socolow, J.A. Foley, J. Hill, E. Larson, et al, Beneficial biofuels - the food, energy, and environment trilemma. *Science*. **325,** 270 – 271 (2009).

See also: D. Tilman, R. H. Socolow, J.A. Foley, J. Hill, E. Larson, et al, Response to letters to the editor. *Science.* **326**, 1346 (2009).

S. Chakravarty, A. Chikkatur, H. de Coninck, S. Pacala, R. Socolow, et al, Sharing global CO_2 emission reductions among one billion high emitters. *Proceedings of the National Academy of Sciences.* **106**,11884-11888 (2009).
S. Chakravarty, A. Chikkatur, H. de Coninck, S. Pacala, R. Socolow, et al, "Reply to Grubler and Pachauri: developing national obligations from individual emissions. *Proceedings of the National Academy of Sciences.* **106 (**2009).

Y. Xu, R. H. Williams, R. H. Socolow, China's rapid deployment of SO_2 scrubber. *Energy & Environmental Science*. **2,** 459-465 (2009).

R.S. Tol, S.W. Pacala, R.H. Socolow, Understanding long-term energy use and carbon dioxide emissions in the USA. *Journal of Policy Modeling.* **31,** 425-445 (2009).

B.K. Mignone, R.H. Socolow, J.L. Sarmiento, M.Oppenheimer, Atmospheric stabilization and the timing of carbon mitigation. *Climatic Change.* **88,** 251-265 (2008).

R. H. Socolow, in *Physics of Sustainable Energy: Using Energy Efficiently and Producing It Renewably,* D. Hafemeister, B. Levi, M. Levine, P. Schwartz, Eds. *AIP Conference Proceedings.* **1044,** 28-48 (2008) Stabilization wedges and climate change.

M. C. Sheppard, R. H. Socolow, Sustaining fossil fuel use in a carbon-constrained world by rapid commercialization of carbon capture and sequestration. *AIChE Journal*, **53**, 3022-3028 (2007).

R.H. Socolow, S.H. Lam, Good enough tools for global warming policy making. *Philosophical Transactions of the Royal Society*, **365**, 897-934 (2007).

J.B. Greenblatt, S. Succar, D.C. Denkenberger, R. H. Williams, R.H. Socolow, Baseload wind energy: modeling the competition between gas turbines and compressed air energy storage for supplemental generation. *Energy Policy*. **35**, 1474-1492 (2007).

G.Q. Lu, J.C. Diniz da Costa, M. Duke, S. Giessler, R. Socolow, R.H. Williams, T. Kreutz, Inorganic Membranes for Hydrogen Production and Purification: A Critical Review and Perspective, *Journal of Colloid and Interface Science* **314**, 589–603 (2007).

R.H. Socolow, S.W. Pacala, A plan to keep carbon in check . *Scientific American*. **295,** 50-57 (2006). ~ *Selected for inclusion in* ***The Best American Science and Nature Writing***, R. Preston, Ed. (Houghton Mifflin, New York, 2007) 259-267.

R. H. Socolow, in *Avoiding Dangerous Climate Change*, H. J. Schellnhuber, W. Cramer, N. Nakicenovic, T. Wigley, G. Yohe, Eds. (Cambridge, New York, 2006), Chap. 36: Stabilization Wedges: An Elaboration of the Concept.

R. H. Socolow, Can we bury global warming? *Scientific American*, 33-40 (July 2005).

R. H. Socolow, R. Hotinski, J.B. Greenblatt, S.W. Pacala, Solving the climate problem: technologies available to curb CO_2 emissions. *Environment*, **46**, 8-19 (2004).

S. W. Pacala, R.H. Socolow, Stabilization wedges: solving the climate problem for the next 50 years with current technologies. *Science*. **305**, 968-972 (2004).

R. H. Socolow, in *The Carbon Dioxide Dilemma: Promising Technologies and Policies*, proceedings of a symposium, April 23-24, 2002. (The National Academies Press, Washington, D.C., 2003), 11-14: The century-scale problem of carbon management.

R. H. Socolow, in *U.S. Policy on Climate Change: What's Next?* J.A. Riggs, Ed. (The Aspen Inst., Washington, D.C., 2002). 97-107, The century-long challenge of fossil-carbon sequestration.

J. N. Galloway, E.B. Cowling, S.P. Seitzinger, R.H. Socolow, Reactive Nitrogen: Too Much of a Good Thing? *Optimizing Nitrogen Management in Food and Energy Productions, and Environmental Change.* **31**, 60-63 (2002).

R. H. Socolow, in *New Dimensions in Bioethics: Science, Ethics, and the Formulation of Public Policy*, A.W. Galston, E.G. Shurr, Eds. (Kluwer Academic, Norwell, MA, 2001), 65-78: Scale, Awareness, and Conscience: The Moral Terrain of Ecological Vulnerability.

V.M. Thomas, R.H. Socolow, J.F. Fanelli, T.G. Spiro, Effects of reducing lead in gasoline: an analysis of the international experience. *Environ. Sci & Technol*. **22**, 3942-3948 (1999).

R. H. Socolow, Nitrogen management and the future of food: Lessons from the management of energy and carbon. *Proc. Natl. Acad. Sci. USA* **96**, 6001-6008 (1999).

R. H. Socolow, S. O'Brien, Cooling the greenhouse. *Energy* **23**, 21-24 (1998).

R.H. Socolow, V. Thomas, The industrial ecology of lead batteries for electric vehicles *Journal of Industrial Ecology* **1**,13-36 (1997).

A.P. Kinzig, R. H. Socolow, Human impacts on the nitrogen cycle, *Physics Today* **47,** 23-31 (1994).

R. H. Socolow, Achieving Sustainable Development that is Mindful of Human Imperfections. *Ecological Applications* **3**, 581-583 (1993).

M. Ross, R.H. Socolow, Fulfilling the promise of environmental technology *Issues in Science and Technology* **7,** 61-66 (1991).

D.L. Kirkpatrick, M. Masoero, A. Rabl, C.E. Roedder, R.H. Socolow, and T.B. Taylor, The Ice Pond—Production of Seasonal Storage of Ice for Cooling. *Solar Energy* **35**, 435-445 (1985).

R.H. Socolow, in *Energy Sources: Conservation and Renewables*, D. Hafemeister, H. Kelly, and B. Levi, Eds. (American Institute of Physics), chap. 2.

Reports and Unrefereed Articles

B.P. Rand, Meggers, F, Witt, W. C., Gokhale, M., Walter, S., Socolow, R.H., "Sunlight to Electricity: Navigating the Field," *an Energy Technology Distillate from the Andlinger Center for Energy and the Environment*, August 2017.

R.H. Socolow, [contribution to] "The Experts on Trump's Climate Decision," John Mecklin, *Bulletin of The Atomic Scientists*, June 4, 2017.

R.H. Socolow, "A Dangerous Moment for Climate Change and for Science." *Bulletin of the Atomic Scientists*, November 22, 2016.

R.H. Socolow, Baldwin, J.W., Chou, C.B., Hannam, P.M., Jhaveri, J., Keller, K., Peng, W., et al, Fusion Energy Via Magnetic Confinement, *an Energy Technology Distillate from the Andlinger Center for Energy and the Environment*, May 2016.

R.H. Socolow, Fitting on the Earth: Challenges of Carbon and Nitrogen Cycle to Preserve the Habitability of the Planet, *Engineering* **2,** 21-22 (2016).

R.H. Socolow, Climate Change and Destiny Studies: Creating Our Near and Far Futures, *Bulletin of the Atomic Scientists*, **71**, *6*, November 2015.

A. Ahmad, A. Glaser, M.V. Ramana, and R. Socolow, Small Modular Reactors: A Window on Nuclear Energy, *An Energy Technology Distillate from the Andlinger Center for Energy and the Environment*, June 2015.

C. Arnold, G. Davies, T. Kreutz, W. Powell, M. Schwartz, R. Socolow, and D. Steingart Grid–Scale Energy Storage: Implications for Renewable Energy, *An Energy Technology Distillate from the Andlinger Center for Energy and the Environment*, June 2014.

R.H. Socolow, interview: Lessons learned from the U.S. experience with shale gas—take the time to get it right, *Science|Business*, Brussels, Belgium, October 2013.

T.G. Kreutz, R.H. Socolow, *Prospective Economics of CO2 Capture and Activation to Transportation Fuels*, the 12th Annual Carbon Capture, Utilization and Sequestration Conference, Pittsburgh, PA, 13-16 May 2013.

R. H. Socolow, Truths We Must Tell Ourselves to Manage Climate Change. *Vanderbilt Law Review* **65**, 1455-1478 (2012).

R.H. Socolow, Remembering the Cuban Missile Crisis, personal memories or reflections by Science and Security Board and Board of Sponsors members of the Bulletin of the Atomic Scientists, October 16, 2012.

R. H. Socolow, 40-year phase-out for conventional coal? If only!", *Environ. Res.* **Lett.** ***7*** (2012).

R. H. Socolow, interview: What would it take? *Momentum*, Institute on the Environment, University of Minnesota, Winter 2012.

R. H. Socolow, 7 billion people, 30 gigatons of CO_2, 1 warming planet: population & climate in the 21st Century, *Discover Magazine*, November 18, 2011.

R. H. Socolow, R.A. Pielke, Jr., R. Olson, When politicians distort science. *Bulletin of Atomic Scientists*, October 20, 2011.

R.H. Socolow, Wedges reaffirmed: a short essay by Robert Socolow and ten solicited comments on the essay (N. Stern, D. Hawkins, F. Dyson, C. Bales, R. Fri, C.Field, P. Sharp, R.Cicerone, R. Holt, and R. May (September 2011).

Robert H. Socolow, Michael Desmond, Roger Alnes, Jason Blackstock, Olav Bolland, Tina Kaarsberg, Nathan Lewis, Marco Mazzotti, Allen Pfeffer, Karma Sawyer, Jeffrey Sllrola, Berend Smit, and Jennifer Wilcox, Direct air capture of CO_2 with chemicals: a technology assessment for the APS Panel on Public Affairs. *APS*, June 1, 2011.

R.H. Socolow, book review of B. Richter's, *Beyond Smoke and Mirrors: Climate Change and Energy in the 21st Century, Am. J. Phys.* **79**, 141 (2011).

R. H. Socolow, in *Issues in Science and Technology*, invited response to the article, Pursuing geoengineering for atmospheric restoration, by R.B. Jackson and J. Salzman, the Forum, **27**, 12-13 (2010).

S. Chakravarty, R.H. Socolow, M. Tavoni, A focus on individuals can guide nations towards a low carbon world. *Climate Science and Policy.* November 13, 2009.

J. J. Blackstock, D. S. Battisti, K. Caldeira, D. M. Eardley, J. I. Katz, et al, *Climate engineering responses to climate emergencies* (Novim, 2009).

R.H. Socolow, interview: Stable-wedge theory. *Green Source,* September 2009.

R.H. Socolow, The critical role of energy efficiency in mitigating global warming, *NYSBA Government Law & Policy Journal*, **10,** 8-22 (2008).

R.H. Socolow, updated "Wedges" figure for lead essay *Carbon's New Math,* Bill McKibben. *National Geographic,* 32-37 (October 2007), pp. 32-37.

R. H. Socolow, in *Fundamentals of carbon capture and storage technology* (The Petroleum Economist, Ltd., London, 2007), forward: *CCS technology: ready to go.*

R.H. Socolow**,** Special report: approaching midnight – facing new unknowns, *Bulletin of the Atomic Scientists* **63**, 45-46 (2007).

R.H. Socolow, Tribute to Amulya Reddy. *Energy for Sustainable Development.* **X**, 15 (2006).

R.H.Socolow, L. DeLorenzo, Modeling technology choice under alternative CO_2 policies: *proceedings of the 8th International Conference on Greenhouse Gas Control Technologies* (GHGT-8), June 19-22, 2006, Trondheim, Norway. Issued on CD-ROM, by Elsevier/IEA GHG.

J. Greenblatt, R.H. Socolow, K. Riahi, A wedges analysis of the IPCC SRES scenarios: *proceedings of the 8th international conference on greenhouse gas control technologies* (GHGT-8), June 19-22, 2006, Trondheim, Norway. Issued on CD-ROM, by Elsevier/IEA GHG.

R.H. Socolow, M. Grubb, Technological development, commercialisation, and diffusion: a ministerial briefing paper ("Annex 2") for the *Energy and Environment Roundtable,* London, UK, March 15-16, 2005.

R.H. Socolow, S.W. Pacala, J. Greenblatt, 'Wedges': early mitigation with familiar technology*: proceedings of the 7th international conference on greenhouse gas control technologies* (5-9 September 2004, Vancouver, Canada). *2*, 1983-1986, *Elsevier,* Amsterdam, 2005.

J. Gummer, C. Butler, E. Claussen, H. Cavalcanti, D. Dillon-Ridgley, D. Gyawali, S. Kato, L. Lailai, J. Marton-Lefevre, S. Rayner, T. Smyth, R.H. Socolow, C. Tickell, N. Witoszek Fitzpatrick, Oxford commission on sustainable consumption report, *Mansfield College,* Oxford (April 2004).

R.H. Socolow, Responses to the invitation to a discussion on the São Paulo Declaration, requested by Amulya Reddy; *Energy for Sustainable Development*. **7**, 23-24, (2003).

R.H. Socolow, T. Kreutz, R. Williams, P. Chiesa, G. Lozza, Production of hydrogen and electricity of coal with CO_2 capture, *Proceedings of the 6th international conference on greenhouse gas control technologies* (GHGT-6), Kyoto, Japan, 30 September - 4 October, 2002.

R.H. Socolow, E, Cowling, et al., Optimizing nitrogen management in food and energy production and environmental protection: summary statement from the 2nd International Nitrogen Conference on Science and Policy, Potomac, MD, 14-18 October, 2001, 2001.

S. Benson, J. Edmonds, R. H. Socolow, T. Surles, Human impacts and management of carbon sources, *Basic Research Needs for Sustainability: The Carbon Problem*, P.M. Eisenberger, M. Knotek, Eds. (sponsored by the National Science Foundation and the Department of Energy), published by Columbia University, 15-20, (1999).

R.H. Socolow (contributor), Industrial Transformation Scientific Plan, P. Vellinga, N. Herbs, Eds. (IHDP Report 12, Bonn, Germany, 1999).

D. Reichle. J. Houghton, B. Kane, J. Ekmann, et al., *Carbon sequestration research and development*,, (U.S. Department of Energy Report, Office of Science and Office of Fossil Energy, Washington, D.C., DOE/SC/FE-1 1999).

R.H. Socolow, Ed., *Fuels Decarbonization and Carbon Sequestration: Report of a Workshop*, Princeton University/Center for Energy and Environmental Studies, Princeton, report 302, 1997).

R. H. Socolow, The weapons shadow over the future of nuclear power, *Proceedings of the second MIT international conference on the next generation of nuclear power, October 1993*. MIT Press, 1-14 - 1-20 (1994).

National Research Council Reports and Other Reports

America's Climate Choices, National Research Council of the National Academies, 2011

Direct Air Capture of CO_2 with Chemicals A Technology Assessment for the APS Panel on Public Affairs, June 1, 2011.

America's Energy Future: Technology Opportunities, Risks, and Tradeoffs, National Academies, 2009.

Grand Challenges for Engineering, National Academy of Engineering, 2008.

Lighting the Way: Toward a Sustainable Energy Future**.** InterAcademy Council (Study Panel Member). October, 2007.

"Report of the Panel on DOE's Carbon Sequestration Program," in *Prospective Evaluation of Applied Energy Research and Development at DOE (Phase Two),* Member of the Panel of DOE's Carbon Sequestration Program that contributed to the Committee on Prospective Benefits of DOE's Energy Efficiency and Fossil Energy R&D Programs (Phase Two), 2007.

Hard Truths: Facing the Hard Truths about Energy: A comprehensive view to 2030 of global oil and natural gas *(Contributor).*A Report of the National Petroleum Council, July 2007.

The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs (contributor), Board on Energy and Environmental Systems, Washington, DC: National Academy Press, 2004.

Review of DOE's Vision 21 Research and Development Program, Phase I (contributor), Board on Energy and Environmental Systems, Washington, DC: National Academy Press, 2003.

An Assessment of the Department of Energy's Office of Fusion Energy Sciences Program (contributor), Fusion Science Assessment Committee, Washington, DC: National Academy Press, 2001.

Vision 21: Fossil Fuel Options for the Future (contributor), Committee on R&D Opportunities for Advanced Fossil-Fuel and Energy Complexes, Washington, DC: National Academy Press, 2000.

Global Change Ecosystems Research (contributor), Ecosystems Panel, Oversight Group for the Ecosystems Panel, Washington, DC: National Academy Press, 2000.

Environmentally Significant Consumption, P.C. Stern, T. Dietz, V.W. Ruttan, R.H. Socolow, and J.L. Sweeney, editors. Committee on the Human Dimensions of Global Change, Commission on Behavioral and Social Sciences and Education, National Research Council, Washington, DC. National Academy Press, 1997.

Toward a Sustainable Future: Addressing the Long-Term Effects of Motor Vehicle Transportation on Climate and Ecology (contributor), Committee for a Study in Transportation and the Environment, Transportation Research Board, National Research Council, Washington, DC, 1997.

Completed Graduate Student Theses Advised or Co-Advised Since 1990

Other Departments

Bryan Mignone, Ph.D. (Geosciences), 2006; Samir Succar, Ph.D. (Electrical Engineering), 2008; Chi-Jen Yang, Ph.D. (Woodrow Wilson School), 2008; Jie Li, Ph.D. (Woodrow Wilson School), 2010; Yuan Xu (Woodrow Wilson School), 2010
Nicolas Lefevre-Marton, Ph.D. (Public Affairs, Woodrow Wilson School) 2013; Phillip M. Hannam, Ph.D. (Woodrow Wilson School), 2016.

Department of Mechanical and Aerospace Engineering
Scott Englander, MSE, 1990; Mark Fulmer, MSE, 1990; Alistair Lloyd, MSE, 1990; Stefano Consonni, Ph.D., 1992; Ryan Katofsky, MSE, 1993; Jeffrey Chen, MSE, l995; Laura Iwan, MSE, 1997; Wendy Hughes, Ph.D., 1998; Theodore Caplow, MSE, 1998; Bruce Lin, MSE, 1999; Paul Henderick, MSE, 2000; Chao Chen, MSE, 2002; Christopher Yang, Ph.D., 2003; Wei Wang, MSE, 2004; David C. Denkenberger, MSE, 2005; Luca De Lorenzo, MSE, 2005; Zhong Zheng, MSE, 2014.

Senior Theses Recently Supervised

Konialian, Michael, *The Prospects and Challenges of Carbon Capture and Storage Oxy-fuel Technology: The Case of the Schwarze Pumpe Pilot Plant*, 2009.
(Konialian was a Princeton University "Scholar in Nation's Service," 2009-2011.
Fowler, William Ulysses, *Jumpstarting a Geologic Carbon Sequestration Industry*, 2007
Lacayo, Antonio I., *Lessons from the Brazilian Ethanol Experience: The Case for Nicaragua*, 2007.

Post-Doctoral Fellows

Shoibal Chakravarty, Physics
Massimo Tavoni, Economics
Zhong Zheng, Mechanical and Aerospace Engineering

Details of Research Presentations Made in the Past 12 Years

2018

External Presentations, 2018

"Truths We Must Tell Ourselves to Manage Climate Change," an *Energy Technologies Area Seminar*, Lawrence Berkeley National Laboratory, Berkeley, CA, February 15, 2018

"A Cool View of Negative Emissions," a *Beyond Carbon Neutral Seminar*, University of Michigan, School of Environment and Sustainability, Ann Arbor, March 15, 2018.

"Gas, oil, climate: A view on the big picture," a Town Hall presentation, at the International Centre for Business and Technology, Sunbury, UK, April 23, 2018

"Introduction to CMI-17," presented jointly with Steve Pacala at the 17th Annual Meeting of the Carbon Mitigation Initiative (CMI), BP Headquarters, St. James's Square, London, April 25, 2018.

Presentations at Princeton University and for the local community, 2018

"Truths Me Must Tell Ourselves to Manage Climate Change," a Princeton Environmental Institute Faculty Seminar, Guyot Hall, February 6, 2018.

"Achieving a Low-Carbon Energy System in the Northeast," a Keynote at the Council of State Governments/Eastern Regional Conference, Northeastern Legislative Climate and Energy Summit: *Promoting the Environment, Public Health and a Sustainable Energy Future*, Andlinger Center for Energy and the Environment, May 11, 2018.

"Witnessing Professionals and Climate Change," panelist on science, a Climate Futures Initiative conference, Marx Hall, May 12, 2018.

2017

Presentations at Princeton University and for the local community, 2017

A presentation of the Solar Distillate in its working state, a production of the Andlinger Center for Energy and the Environment, presented jointly with co-author Chuck Witt at *CEREAL* (Conversations on Environment, Responsible Energy, And Life), Eno Hall, Princeton University, February 7, 2017,

"Why Engage Policy Makers and the Interested Public?" A dinner presentation of The Bulletin of the Atomic Scientists' *Workshop on Communicating Science to Policy Leaders and the Interested Public*, Prospect House, Princeton University, February 23, 2017.

"Introduction to CMI-16," presented jointly with Steve Pacala at the 16th Annual Meeting of the Carbon Mitigation Initiative (CMI), Friend Center, Princeton University, April 4, 2017

2016

External presentations, 2016

"Fossil fuels and climate change—Lessening the damage from the collision," presented at the Conference of the Energy Exchange Series, Customs House, Brisbane, February 9, 2016.

"Truths we must tell ourselves to manage climate change," a UQ Energy Express Seminar, presented at The University of Queensland, Brisbane, February 9, 2016.

National Academy of Engineering Roundtable on the Communication and Use of Social and Behavioral Sciences, February 26, 2016.

"On Point," National Public Radio, invited speaker on mitigating the threat of sea level rise, April 4, 2016.

"Introduction to CMI-15," presented jointly with Steve Pacala at the 15th Annual Meeting of the Carbon Mitigation Initiative (CMI), BP, St. James's Square, London, April 13, 2016.

"Post-2035: Budgets, Biocarbon, and Beyond," presented at the 15th Annual Meeting of the Carbon Mitigation Initiative (CMI), BP, St. James's Square, London, April 14, 2016.

"The Challenge of Climate Change," A Townhall at BP, Naperville, IL May 30, 2016.

"The Global Climate Challenge," Keynote Address at the International Seminar on China's Low Carbon Energy Transition, Tsinghua University, Beijing, November 15, 2016

"Climate Change and Our Future Leaders," Panel Interview: Future Leadership in Climate Change and Low Carbon Transition, Tsinghua University, Beijing, November 16, 2016.

Presentations at Princeton University and for the local community, 2016

"Climate Change and Destiny Studies: Creating Our Near and Far Futures," presentation at the faculty dinner of the Princeton Energy and Climate Scholars, Prospect House, Princeton University, February 18, 2016.

"Numeracy for a Low-Carbon Energy Future," Plenary lecture, Eastern States section of the Combustion Institute, Computer Science Building, Princeton University, March 16, 2016.

2015

External presentations, 2015

"Introduction to CMI-15," presented jointly with Steve Pacala at the 15th Annual Meeting of the Carbon Mitigation Initiative (CMI), BP, St. James's Square, London, April 13, 2016.

"Post-2035: Budgets, Biocarbon, and Beyond," presented at the 15th Annual Meeting of the Carbon Mitigation Initiative (CMI), BP, St. James's Square, London, April 14, 2016.

"Buttressing Sustainability with Solid and Durable Analysis: An Appreciation of Tom Graedel," Yale University, April 23, 2015

"Can carbon capture and storage forge the unusual alliances that finally bend the global emissions trajectory?" presented at Gordon Research Conference, Stonehill College, Easton, MA, May 31, 2015

"Fitting on the Earth: Grand Challenges to Preserve the Habitability of the Planet," presented at The 2nd Global Grand Challenges Summit, Chinese Academy of Engineering, Beijing, September 15, 2015

Forum panelist at the National Academy of Engineering 2015 Annual Meeting: "Grand Challenges for Engineering: Imperatives, Prospects, and Priorities," Washington, D.C., October 5, 2015

"Destiny Studies: Placing Climate Change and Nuclear Power in our Collective Future," a presentation at the Bulletin of the Atomic Scientists' 6th Annual Clock Symposium, Chicago, IL, November 16, 2015.

Presentations at Princeton University and for the local community, 2015

"Low-Carbon Technology; Carbon Budgets and Committed Emissions," presented at the 14th Annual Meeting of the Carbon Mitigation Initiative (CMI), Carl Fields Center, April 14, 2015

A talk in Princeton, presented jointly with Steve Pacala, at the 14th Annual Meeting of the Carbon Mitigation Initiative (CMI), Carl Fields Center, April 14, 2015

Chair, "Lessons from the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," a Climate Futures Initiative seminar with Michael Oppenheimer, Marc Fleurbaey, and V. Ramaswamy, Richardson Hall, Princeton University, February 5, 2015

2014

External presentations, 2014

"Innovative strategies to strengthen R&D for "clean" electric power—and other sectors," presented at the U.S. Department of Energy Cornerstone Workshop for the Quadrennial Technology Review, Arlington,VA, December 4-5, 2014.

Invited speaker at Science|Business symposium, "The EU Energy Challenge; Can innovation fill the gap?" Brussels, November 14, 2014.

"Risks of Climate Change and Risks of Climate Change Solutions," invited speaker at Euro-Mediterranean Center for Climate Change, Bologna, July 18, 2014

"Risks of Climate Change and Risks of Climate Change Solutions," invited speaker at Workshop on Risk and Uncertainty Perception: Modeling and Climate Change Policy, RISICO Project, Bocconi University, Milan, July 15-16, 2014

"An outsider dream of a new generation of IAM featuring transparency, cosmopolitanism, and a nimble treatment of time," invited speaker at the Workshop on Equity and Risk in Integrated Assessment Models, Collège d'Études Mondiales, Paris, May 19-20, 2014

"Advancing International Climate Change Cooperation, guest panelist at Columbia Earth Institute Workshop, Columbia University, April 18, 2014

"Alumni Panel on Alternative Careers, "Harvard Physics Alumni Reunion, April 4, 2014

"The road ahead for planetary environmentalism: An appreciation of Charles Weiss," guest lecture at Georgetown University, March 28, 2014

"*Why* are we here? Why are *we* here? Why are we *here*?" Invited speaker at *Pathways for Climate Solutions: Assessing Energy Technology and Policy Innovation*, a workshop at Aspen Global Change Institute, February 24-28, 2014

Presentations at Princeton University and for the local community, 2014

"Destiny Studies: A plausible element of the new Climate Futures Initiative at Princeton University," presented at the inaugural initiative building lunch of the Climate Futures Initiative, Prospect House, October 2, 2014.

"Assuming wise terrestrial biocarbon solutions to climate change by well-crafted conditionality," presented at *Princeton Studies Food: A Conference Showcasing Food and Agricultural Systems Research and Interest at Princeton*, organized by Princeton Environmental Institute, Princeton Institute for International and Regional Studies, The Office of Sustainability, and The Program for Science, Technology and Environmental Policy at the Woodrow Wilson School, Wallace Hall 300, September 26, 2014

Invited panelist at *Climate Change Panel*, Alumni Faculty Forum, McCormick Hall, May 30, 2014

Invited speaker at *Backwards and Forwards: The history and future of technical research in architecture and buildings at Princeton*, a workshop organized jointly by the School of Architecture and Andlinger Center for Energy and the Environment, Architectural Laboratory and Embodied Computation Lab, May 29, 2014

Remarks at the Mechanical and Aerospace Engineering celebration of election to the American Academy of Arts and Sciences, May 27, 2014

"Historicizing Climate Change," a workshop presented on behalf of the PIIRS research community, *Communicating Uncertainty: Science, Institutions, and Ethics in the Politics of Global Change*, organized jointly with Melissa Lane, Aaron Burr Hall, May 2-3, 2014

Guest speaker at Prof. Melissa Lane's course, "Science and Democracy," May 1, 2014, Robertson Hall, Princeton University

A talk in Princeton, presented jointly with Steve Pacala, at the 13th Annual Meeting of the Carbon Mitigation Initiative (CMI), providing an overview of the project, Carl Fields Center, April 15, 2014

Homage to Frank von Hippel, Remarks at the dinner culminating the Woodrow Wilson School – Bulletin Symposium, *Speaking Knowledge to Power*, April 9, 2014

2013

External presentations, 2013

"The road ahead for planetary environmentalism: An appreciation of Bill Moomaw," The Fletcher School, Tufts University, October 18, 2013

Science Business Policy Symposium, "Gas: Too Much of a Good Thing?" Brussels, Belgium, October 1, 2013.

"Climate, poverty, and destiny," guest lecture at *Earth Human System* course, Columbia University, September 23, 2013.

"The Geoegineering Agenda," a briefing at the kickoff meeting of the Committee on Geoengineering Climate: Technical evaluation and discussion of impacts. National Academy of Sciences, July 16, 2013.

"Stabilization wedges and the polygame," Guest Lecture, Alta Scuola Politecnica in Belgirate, Italy, May 24, 2013.

"Truths we must tell ourselves to manage climate change," Guest Lecture, Institute for Environment and Sustainability, Joint Research Center, Ispra, Italy, May 23, 2013.

"Truths we must tell ourselves to manage climate change," Guest Lecture, CLAIRE Spring Seminar Series: Smart Energy Solutions in Urban Environment, Pracatinat, Italy, May 22, 2013.

"Carbon mitigation, energy challenges," Guest Lecture, The Energy Department of Politecnico de Torino, Torino Energy Week: Reconsidered Energy, Turin, Italy, May 21, 2013.

"Truths we must tell ourselves to manage climate change," Guest Lecture, Georgetown University Environment Initiative, Washington, D.C., April 25, 2013

"Carbon Mitigation Initiative at Princeton and Climate Change," presentation to BP's Carbon Solutions team, London, January 18, 2013

Presentations at Princeton University and for the local community, 2013

"Humanity's collective future animates environmentalism," a response to the lecture of Samuel Scheffler, PIIRS Communicating Uncertainty speaker, December 4, 2013.

"Mitigating Climate Change," guest lecture at *Global Environmental Change: Science, Technology, and Policy course,* November 11, 2013.

"Mitigation and Adaptation, Risk and Equity," guest lecture at *Climate Change, Adaptation, and Urban Design* (ARC 519), October 9, 2013.

"A Message of Thanks," a personal statement to India in appreciation of the hospitality granted to the Princeton Energy & Climate Scholars during their 2013 summer trip, May 2013.

A talk in Princeton, presented jointly with Steve Pacala, at the 12th Annual Meeting of the Carbon Mitigation Initiative (CMI), April 16, 2013, providing an overview of the project.

"Geoengineering and our Collective Future: New challenges for ethics," a workshop at Princeton on ethics of risk and climate change, April 13, 2013.

"Coming to Grips with Future Time," a lecture at Princeton on environmental humanities in a changing world, March 8, 2013.

"Truths we must tell ourselves," Guest Lecture, Energy for a Greenhouse-Constrained World, MAE 328, Princeton, NJ, February 21, 2013

2012

External presentations, 2012

Closing remarks for Yale Center for Environmental Law & Policy: "Global Climate Change Policy Without the United States: Thinking the Unthinkable" Yale Law School, New Haven, CT, November 9-10, 2012

Panelist "Considerations for Future Energy Systems" and Moderator "Science and Technology Policies Related to Sustainable Energy" National Research Council's Japan-U.S. Workshop on Sustainable Energy Futures, Washington, D.C., June 26, 2012

Alta Scuola Politecnica Spring School, Belgirate, Lago Maggiore, Italy, "Global change and sustainability," coordinated by Professor Gatto, May 18, 2012. You can find the video in the Courses playlist or directly at this link http://www.youtube.com/watch?v=0Cr18jYiUsk&feature=share&list=PLA7CEC121F9D315A2

"What Would We Do If We Took Climate Change Seriously?" Student-initiated Pennergy Colloquium, University of Pennsylvania, Philadelphia, PA, April 23, 2012

"The Challenge of Climate Stabilization" and "What Would We Do If We Took Climate Change Seriously?" University of Oregon, Eugene, OR, April 9, 2012

"Air Capture – Introduction and Overview" and "The Cost of Air Capture" Panelist, Institute for Sustainable Energy, Environment, and Economy, University of Calgary, Direct Air Capture Summit, Calgary, Alberta, Canada, March 7-8, 2012

"Toward More Productive Thinking about Energy Supply and Demand" Supply and Demand: Barriers to a New Energy Future, Vanderbilt Law School Symposium, Vanderbilt University, February 24, 2012

"What would we do if we took climate seriously?" Energy and Resources Group Spring 2012 Colloquium Series, University of California Berkeley, February 15, 2012

Presentations at Princeton University and for the local community, 2012

"Mitigating Climate Change," guest lecture in "Global Environmental Change: Science, Technology, Policy" (Profs. Eric Wood and Justin Sheffield), Princeton, NJ, November 26, 2012

Moderator "The Future of Nuclear Reactors: Large or Small?", Princeton Energy and Environment Corporate Affiliates Program and the Andlinger Center for Energy and the Environment, Synergize 2012, Inaugural Annual Meeting, Princeton, NJ, November 13, 2012

Panelist "What's Next in Energy" Aspire Celebration, Princeton, NJ, October 19, 2012

Guest Speaker for "Session 02: What is Sustainability?" Sustainable Engineering and Development Scholars Program 2012-2013, a program of Engineers Without Borders, Princeton University, Princeton, NJ, October 18, 2012

"Combustion in a Global Environmental Context, Part One: Planetary Thinking" and "Combustion in a Global Environmental Context, Part Two: Stabilization Wedges" 2012 Princeton University-CEFRC Summer School on Combustion, Princeton, NJ, June 25, 2012

A conversation on "Wedges Reaffirmed," a short essay by Robert Socolow and "Ten solicited comments on the essay and High-consequence outcomes and internal disagreements: tell us more, please", Thunch, an Astrophysics Department lunch seminar, Princeton, NJ, May 3, 2012

Discussant for Princeton Environmental Institute's seminar on Melissa Lane's book: Eco-Republic: What the Ancients Can Teach Us About Ethics, Virtue, and Sustainable Living, Princeton, NJ, May 3, 2012

"CMI Through Year 11" (with Stephen Pacala) CMI Eleventh Annual Meeting, Princeton, NJ, April 17, 2012

"Introduction to the PIIRS Communicating Uncertainty Project: Science, Institutions and Ethics in the Politics of Global Climate Change" Workshop on Climate Change and Water Cycle, and Communicating Uncertainty, Princeton, NJ, March 30-31, 2012

2011

External presentations, 2011

"Carbon-emissions Stabilization Wedges Reaffirmed," guest speaker, Green Business Club, Columbia Business School, New York, NY, October 17, 2011

"Carbon-emissions Stabilization Wedges Reaffirmed," guest lecturer at Yale School of Forestry & Environmental Studies, October 4, 2011

"Negative Emissions: Comprehending Scale," International Workshop on Modeling and Policy of CO_2 Removal from the Atmosphere, Fondazione Eni Enrico Mattei (FEEM), Isola di San Giorgio Maggiore, Venice, Italy, May 31, 2011

"Negative Emissions from the Manipulation of Carbon Sinks: A Challenge to Land-Use Modelers," Land-Use Modeling Workshop, Geophysical Fluid Dynamics Laboratory, Princeton, NJ, May 17, 2011

"How Would We Act If We Took Climate Change Seriously?" Harvard Club, New York, NY, May 17, 2011

"How Would We Act If We Took Climate Change Seriously?" Kennedy School of Government, Harvard University, May 4, 2011

"Carbon Mitigation Initiative," guest lecturer, Stanford University, School of Humanities & Sciences, Environmental Norms, Institutions, and Policies Workshop, Stanford, CA, April 28, 2011

"Direct Capture of CO_2 from Air with Chemicals: A Technology Assessment A Report of the American Physical Society" Briefing for the American Physical Society Executive Board, April 28, 2011

"How Would We Act If We Took Climate Change Seriously?" Lawrence Berkeley National Laboratory, March 28, 2011

"How Would We Act If We Took Climate Change Seriously?" Florida Climate Institute and a co-venture between the University of Florida and Florida State University, March 22, 2011

"Direct Capture of CO_2 from Air with Chemicals: A Technology Assessment A Report of the American Physical Society" Panel on Public Affairs, American Physical Society, Washington, DC, February 4, 2011

Presentations at Princeton University and for the local community, 2011

"Technology and Policy Responses to Mitigating Climate Change," guest speaker, Global Environmental Change: Science, Technology, Policy, a freshman seminar, Princeton University, Princeton, NJ, November 21, 2011

"A Conversation on the Science and Politics of Energy," a conversation with Bernie Hayel, Aspire Leadership Assembly, Princeton, NJ, November 11, 2011

Guest speaker, Environmental Affairs Forum, an undergraduate organization, Princeton University, Princeton, NJ, November 8, 2011

Guest speaker, Engineers Without Borders-Princeton University: Sustainable Engineering and Development Scholars Program, Princeton, NJ, October 5, 2011

"The Challenge of Climate Stabilization," Our Future. Our Challenge, Princeton Day School, Princeton, NJ, April 16, 2011

"A Ten-Year View of CMI" and "Overview" (with Stephen Pacala) CMI Tenth Annual Meeting, April 12, 2011

"How Would We Act If We Took Climate Change Seriously?" Nanotechnology for Clean Energy IGERT, Princeton, NJ, April 5, 2011

2010

External presentations, 2010

"How Would We Act If We Took Climate Change Seriously?" Lamont Colloquium, Lamont Doherty Earth Observatory, Palisades, NY, December 3, 2010.

"The Carbon Mitigation Initiative at Princeton University," BP, Sunbury, UK, November 24, 2010.

“Smart, safe, and just: Goals for the Global Energy System," Denis Anderson Memorial Lecture, Imperial College, South Kensington Campus, London, UK, November 23, 2010.

“Safe and fair: The Daunting Goals of the Global Energy System,” Towards a Sustainable Future: The Role of Long-Term Investment, Fondazione Eni Enrico Mattei (FEEM) and the Long Term Investor’s Club (LTIC), Isola di San Clemente, Venice, Italy, October 28, 2010.

“Climate Change Mitigation Challenges and Opportunities for Coal Country,” Global Warming Forum: Examining a Hot Topic, Purdue University, West Lafayette, IN, September 27, 2010.

“America's Climate Choices, Highlights of a National Academies Project and Personal Thoughts,” Forum on Climate Change Science and Consequences, American Chemical Society National Meeting, Boston, MA, August 23, 2010.

“Technology, Policy, and Values for Living in a Greenhouse,” World Bank Retreat, St. Michaels, MD, June 24, 2010.

Acceptance Speech, Keystone Environment Award, Washington, DC, June 10, 2010.

“Fitting on the Earth and the Need for Integrative Analysis,” ARPA-E, Washington, DC, June 3, 2010.

“Technology, Policy, and Values for Living in a Greenhouse,” Duke University, Durham, NC, April 16, 2010.

“Summary of the Meeting,” The Asilomar International Conference on Climate Intervention Technologies, Pacific Grove, CA, March 25, 2010.

“Direct Capture of CO_2 from Air with Chemicals,” The Asilomar International Conference on Climate Intervention Technologies, Pacific Grove, CA, March 23, 2010.

“Technology, Policy, & Values for Living in a Greenhouse,” Alumni Association and the Princeton Club of Southwest Florida, Naples, Florida, February 20, 2010.
“Direct Air Capture of CO_2: Update on an APS-POPA study,” Panel on Public Affairs, American Physical Society, Washington, DC, February 5, 2010.

Presentations at Princeton University and for the local community, 2010

Guest speaker, “CO2 capture from the air,” Mathey Energy Table, co-sponsored by PEI, Mathey College and Rockefeller College, Princeton University, Princeton, NJ, December 16, 2010

"How Would We Act If We Took Climate Change Seriously," The David Bradford Seminars in Science, Technology, and Environmental Policy, Princeton University, Princeton, NJ, December 6, 2010.

Guest speaker, fund-raiser for Friends of the Princeton Public Library, December 5, 2010

"One Billion High Emitters," Discussion of a paper at the Climate Change Colloquium, Princeton University, Princeton, NJ, November 30, 2010.

"Introduction to the Carbon Mitigation Initiative," Presentation to Lamar McKay, BP, Princeton University, Princeton, NJ, November 17, 2010.

"Living Ethically in a Greenhouse," A conversation with Carl Ferenbach and the High Meadow Fellows, Princeton University, Princeton, NJ, November 16, 2010.

Guest speaker, Energy Panel, Collective Motion, a workshop of the Princeton chapter of Engineers without Borders, Princeton University, Princeton, NJ, November 12, 2010

"Converting CO2 that Came from Where?" Workshop on Future Directions in CO2 Reduction Chemistry, Princeton University, Princeton, NJ, October 21, 2010.

Princeton faculty comment at the symposium, "The History of Oil in America: Before and After the Gulf Spill," sponsored by PEI and the Princeton History Department, Princeton University, Princeton, NJ, October 20, 2010

Participant, MISTRA Workshop on the Politics and Policy of Carbon Capture and Storage, organized by Michael Oppenheimer, Princeton NJ October 14-15, 2010

Guest speaker, Environmental Affairs Forum, an undergraduate organization, Princeton University, Princeton, NJ, October 13, 2010

"Introduction to the Carbon Mitigation Initiative," A presentation to John Morgan, Business Unit Leader for the Hydrogen Power and CCS Business Unit in Alternative Energy, Princeton University, Princeton, NJ, October 6, 2010.

Guest speaker, Global Warming Debate (with Fred Singer and Isaac Held), hosted by FUSION, an undergraduate organization, Princeton University, Princeton, NJ, September 23, 2010

"Science, Climate Change, and the Country's Need," Rush Holt Fundraiser, Terhune Farms, Princeton, NJ, June 6, 2010.
"Technology, Policy, and Values for Living in a Greenhouse," Millennial Precept, Reunions 2010, Princeton University, Princeton, NJ, May 28, 2010.

"Technology, Policy, and Values for Living in a Greenhouse", IMAGINE Sustainability Conference, Morning Keynote, Princeton University, Princeton, NJ, February 12, 2010.

"Hello, Hard Core; Goodbye, Annex I, An Overview of "Integration" research," Ninth Annual Meeting, Carbon Mitigation Initiative, Princeton University, Princeton, NJ, February 9, 2010.

2009

External presentations, 2009

"Technology, Policy, and Values for Living in a Greenhouse," Advanced Energy Systems Division Reception 2009 International Mechanical Engineering Congress and Exposition, American Society of Mechanical Engineers, November 17, 2009.

"One Billion High Emitters: A Conceptual Framework for Living in a Greenhouse," Xynteo Global Leadership & Technology Exchange, Alexandria, VA, November 11, 2009.

"Carbon Dioxide Capture and Storage in Context," The ICON Group, Calgary, Alberta, Canada, October 30, 2009.

"Technology, Policy, and Values for Living in a Greenhouse," 2009-2010 ISEEE Distinguished Speaker Series "North American Energy Systems 2030+", Institute for Sustainable Energy, Environment, and Economy University of Calgary, Calgary, Alberta, Canada, October 29, 2009.

"The APS-POPA study on direct air capture," Brief midcourse report, POPA Meeting, Washington DC, October 2, 2009.

"Sharing Global CO_2 Emission Reductions Among One Billion High Emitters," with Laurence Tubiana, Chaire développement durable de Sciences Po, Special Conference à Sciences Po, September 21, 2009.

"Wedges, Technology, and Climate Policy," ECN-IVM Symposium, Technology: The Key to a Copenhagen Agreement? Held on the occasion of the defense of Heleen de Coninck's PhD thesis, Amsterdam, The Netherlands, September 18, 2009.

"Sharing Global CO_2 Emission Reductions Among One Billion High Emitters," Institute for Environmental Studies (IVM), VU University, Amsterdam, The Netherlands, September 17, 2009.

"Sharing Global CO_2 Emission Reductions Among One Billion High Emitters," The World Bank, Washington, DC, September 14, 2009.

Launch of the Berkeley Workshop: "Study of Direct Capture of CO_2 from the atmosphere and post-combustion CO_2 capture from flue gases," Panel on Public Affairs, American Physical Society, Berkeley, CA, August 4-5, 2009.

"Technology, Policy, and Values for Living in a Greenhouse," Director's Distinguished Lecture, Lawrence Livermore National Laboratory, Berkeley, CA, August 3, 2009.

"Technology and Policy for Living in a Greenhouse," Politecnico di Milano, July 20, 2009.

"A Physicist's View of WG III," Robert Socolow, BOG 2, WG III, IPCC 5AR Scoping Meeting, Venice, July 14, 2009.

"Climate Change and the Industrial Ecology of Carbon," by video conference. Transitions Toward Sustainability Fifth International Conference on Industrial Ecology, Calouste Gulbenkian Foundation, Lisbon, Portugal, June 23, 2009.

"Reactions and Perspectives on Geoengineering." Moderator's introduction, "Geoengineering Options to Respond to Climate Change: Steps to Establish a Research Agenda," A workshop of the America's Climate Choices project of the National Academies, Washington, DC, June 15-16, 2009.

"Living in a Greenhouse," Harvard 50th Reunion, Harvard University, June 2, 2009.

"Low-Carbon Energy," A briefing for MissionPoint, Norwalk, CN, April 24, 2009.

"Low-Carbon Energy," Summit on America's Climate Choices: Developing the Framework for a National Response to Climate Change: Keynote Perspectives on Climate Change, Washington, D.C., March 30, 2009.

"Stabilization Wedges – Five Years Later," Taking the Carbon out of Energy, Aspen Environmental Forum, March 27, 2009.

"Stabilization Wedges: Implications for U.S. Climate Change Mitigation Policy," A briefing for Congressman Henry Waxman, Washington DC, March 16, 2009.

"Technology, Policy, and Values for Living in a Greenhouse," The Ronald F. Probstein Lecture in Engineering Science, Department of Mechanical Engineering, M.I.T., March 13, 2009.

"Grand Challenges for Energy and the Environment," Summit on the National Academy of Engineering Grand Challenges, Duke University, March 2, 2009.

Presentations at Princeton University and for the local Community, 2009

"Nuclear Power in Context," Workshop on Nuclear Power and Climate, Princeton University, November 19, 2009.

"Overview of CMI," Robert Socolow and Steve Pacala, Briefing for David Nagel, Princeton University, July 24, 2009.

"Living in a Greenhouse," A talk to 55 PLUS, Jewish Center, Princeton, NJ, May 21, 2009.

"Pretending to Reduce Emissions is Unethical!" Ethics and Climate Change Lecture Series. Discussant for the talk, "The ethics of carbon trading," by Robyn Eckersley, Princeton University, April 21, 2009.

"Study of Direct Capture of CO_2 from the atmosphere and post combustion CO_2 capture from flue gases Panel on Public Affairs," American Physical Society, First workshop, March 23-25, 2009, Princeton, NJ.

"Renewal in CMI, Princeton University, and the United States," Eighth Annual Meeting Carbon Mitigation Initiative, Princeton University, February 10, 2009.

2008

External presentations, 2008

"The Challenge of Climate Stabilization," URI Honors Colloquium, University of Rhode Island, Kingston, Rhode Island, December 2, 2008.

"Efficiency through Technology," Panel on Product Design and Engineering, Re-Imagining Cities: Urban Design After the Age of Oil, Penn Institute for Urban Research, University of Pennsylvania, Philadelphia, Pennsylvania, November 7, 2008.

"Place-based Mitigation of Climate Change" Conference keynote, Re-Imagining Cities: Urban Design After the Age of Oil, Penn Institute for Urban Research, University of Pennsylvania, Philadelphia, Pennsylvania, November 6, 2008.

"Setting the Stage," Future of Nuclear Energy Conference, Chicago, Illinois, September 25-26, 2008.

"Technologies for Living in a Greenhouse," Energy Leadership Lecture Series (co-hosts: Institute for Energy Efficiency and Kavli Institute for Theoretical Physics), University of Santa Barbara, California, August 12, 2008.

"Carbon Mitigation Initiative: How Fast Can We Go If We Really Spend Some Money? What Will It Take to Get Us There?" Aspen Ideas Festival, Aspen, Colorado, June 30-July 6, 2008.

"Toward an American Solution," Conference on the American Response to Climate Change, Wild Center - Tupper Lake, NY, June 25, 2008.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," Annual Meeting, MissionPoint Capital Partners, Norwalk, CT, May 21, 2008

Invited remarks (three-member panel), "What is the Right Economic Approach to Global Warming?", McKinsey Etruthesxecutive Roundtable Series in International Economics, Council on Foreign Relations, New York, NY, April 14, 2008.

"Living Ethically in a Greenhouse," Conference keynote, Energy and Responsibility: A Conference on Ethics and the Environment, University of Tennessee, Knoxville, Tennessee, April 10, 2008.

"Living in a Greenhouse with the Help of Stabilization Wedges: A talk for researchers and teachers," American Institute of Physics Governing Board, Washington, D.C., March 28, 2008

"Putting CO2 Capture and Sequestration into First Gear," Global Task Force on Carbon Capture and Storage, Earth Institute, Columbia University, February 14, 2008.

Presentations at Princeton University and for the local Community, 2008

"From the Carbon Mitigation Initiative to the Sustainable Aviation Initiative, presentation to Netjets Princeton Review Group, December 16, 2008

"The Challenge of Climate Stabilization," Hun School, Princeton, New Jersey, December 5, 2008.

"Geoengineering: The Looming Challenge," SEAS-GFDL Workshop, Princeton University, October 29, 2008.

"Prospicience (The Art and Science of Looking Ahead) and Geoengineering: What If We Can Dial Our Future?" Ethics and Climate Change Lecture Series, Princeton University, October 14, 2008.

"The Challenge of Climate Stabilization," Guest lecture, EGR 495: Special Topics in Entrepreneurship: Ventures to Address Global Challenges, October 6, 2008

"Climate Policy: Based on Individual Emissions," Princeton Energy and Environment Scholars Lecture, September 23, 2008

"Living Ethically in a Greenhouse," Biofuels Workshop, Princeton University, June 19-20, 2008.

"Sustainable Princeton: Toward Town Targets?", sponsored by Princeton Future, Princeton Public Library, Princeton, NJ, May 3, 2008

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," Guest lecture**,** EGR194-MAT194-PHY194 (EMP-1), April 24, 2008

"Lessons Learned," Conference on China and the Environment: The Challenges Ahead, Solutions and Future Research, April 19, 2008

"Technology and Policy for Living in a Greenhouse," Maclean House Alumni Lecture Series, Princeton University, April 8, 2008.

"Living in a Greenhouse with the Help of Stabilization Wedges," National Academy of Engineering Regional Meeting, Friend Center, Princeton University, March 4, 2008.

2007

External presentations, 2007

"Technology and Tough Global Targets," *Invited, Lehman Brothers Climate Change Workshop,* New York, NY, December 6-7, 2007.

Chair, Academic Review Panel, *Invited Comment, McKinsey & Company:* Reducing U.S. Greenhouse Gas Emissions *How Much At What Cost?*, New York, NY December 4, 2007.

"Climate Change Mitigation under Strong Carbon Constraints," *Invited, 50th Anniversary of the Global CO2 Record Symposium and Celebration*, Kona, Hawaii, November 28-30, 2007.

"The Stratospheric Aerosol Injection Wedge: Competitive, Transient, Distracting, and Scary," *Invited Comment, Climate Engineering Workshop, Harvard University,* Cambridge, MA, November 8-9, 2007.

"Policy and Technology for Living in a Greenhouse," *Invited, P8 Summit of Trustees of Major Pension Funds,* London, UK, November 5, 2007.

"Tackling Carbon by Using Electricity Efficiently," *Invited, Greenplug Alliance Conference,* San Francisco, CA, October 29, 2007.

"U.S. Carbon Challenge: Policy and Technology," *Keynote, Sanford C. Bernstein 2007 Carbon Symposium,* Investment in the Carbon Chain from Producer to Purchaser, New York, NY, October 9, 2007.
Invited Participant for the October 5 Working Lunch on US-China Climate Change Initiative at the Asia Society, New York, NY, October 5, 2007.

"Energy and the Global Environment for the Physicist as Researcher and Teacher," *Invited, Department of Physics, Yale University,* September 28, 2007.

"Ethics and the Greenhouse," *Invited,* Bioethics Seminar, *Yale University,* September 27, 2007.

"Technology and Policy for Global Carbon Mitigation," *Keynote, Vinson & Elkins Climate Change Program,* Washington, D.C., September 24, 2007.

"Options for Mitigation," *Invited, World Bank Executive Directors Colloquium 2007*: Climate Change: Implications for the Bank's Mission for Sustainable Development, Washington, DC, September 20-21, 2007.

"Energy Security Wedges," *Invited Participant, BP Discussion Group,* New York, NY, September 10-11, 2007.

"The Critical Role of Energy Efficiency in Mitigating Global Warming," *Keynote,* Housing into the Future: Stepping toward Carbon Neutrality: A seminar of the Household Energy End-Use Project (HEEP). *Victoria University of Wellington, Wellington, New Zealand,* by video-conference, August 28, 2007.

"'Equitable Climate Change Mitigation: A New Formulation," *Invited, Informal Thematic Debate of the UN General Assembly on Climate Change as a Global Challenge* Panel on Mitigation Strategies in the context of Sustainable Development, United Nations, July 31, 2007.

"The Critical Role of Energy Efficiency in Mitigating Global Warming," *Keynote, Public Service Commission, State of New York.* Albany Law School, Albany, New York, July 19, 2007.

"Wedges, Global Warming Mitigation, and Business Opportunity," *Invited, Mission Point Capital Partners*, Norwalk, CN, July 18, 2007.

"Solving the Carbon Problem," *Invited, Texas Pacific Group,* Retreat, Aspen, Colorado, June 26, 2007.

"Mitigating Global Scorching: Getting Real!" *Invited, Shalom Center,* Philadelphia, PA, June 18, 2007.

"Climate Change Mitigation: A New Source of Wealth and Jobs," *Keynote, North American Labor Assembly on Climate Crisis,"* New York, NY, May 7, 2007.

"Scouting the carbon management frontier: Technology, policy, and economics," *Keynote,* Washington Energy Conference, *School of Advanced International Studies, Johns Hopkins University,* Baltimore, MD, April 20, 2007.

"Stabilization Wedges and the Management of Global Carbon for the Next 50 Years: A Primer for the Physicist as Researcher and Teacher," *Invited, Fermi National Accelerator Laboratory,* Batavia, IL, April 18, 2007.

"U.S. Climate Policy: Avoiding Mitigation Lite," *Invited, Testimony to the Finance Committee, U.S. Senate,* Washington, DC, February 27, 2007.

"Stabilization Wedges: A Concept and a Game for Teaching about Cutting Carbon Emissions," *Keynote, 2007 AAAS Annual Meeting,* Town Hall: Climate-Change Special Session SE-109, Communicating and Learning about Global Climate Change: An Event for Teachers, Students, and other Communicators and Learners, San Francisco, CA, February 18, 2007 (with Roberta Hotinski).

Presentations at Princeton University and for the local Community, 2007

"Policy and Technology for Living in a Greenhouse," *Invited, Presentation for ENV FRS 175 Seminar*: Signals, Yardsticks and Tipping Points of Global Warming, Princeton University, December 6, 2007.

"Policy and Technology for Living in a Greenhouse," *Invited,* Guest Lecturer in Class: *Physics 104, Energy, Environment, and Man, Rider University,* Lawrenceville, NJ, November 19, 2007.

"Strategic Opportunities for MAE in Energy," *Invited, MAE Retreat,* Cherry Valley Country Club, November 1, 2007.

"Building Capacity for Living in a Greenhouse," *Invited, Founders' Societies Meeting, SEAS,* Princeton University, June 20, 2007.

"Mitigating Global Warming: Getting Real!" *Invited, Millennial Class of '00 Reunions Lecture,* Princeton University, June 2, 2007.

"Stabilization Wedges: A Concept and a Game for Teaching about Cutting Carbon Emissions," *Invited,* Meeting for Supporters, *Stony Brook Millstone Watershed Association,* Pennington, NJ May 17, 2007.

"Wedges and How We Can Best Combat Global Climate Change," *Invited, New Jersey Meadowlands Commission (NJMC) Symposium,* Lyndhurst, NJ, May 15-17, 2007.

"Energy Security and Climate Change: Drivers of transformation for the global energy system," *Invited, Conference on Saudi Arabia: Oil, Energy, and Middle East,* Princeton University, May 11, 2007.
"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, Guest lecture for EGR194-MAT194-PHY194 (EMP-One)* An Integrated Introduction to Engineering, Mathematics, Physics, Princeton University, April 26, 2007.

"Strategies for mitigating climate change: Enabling the stabilization wedges," *Invited, Science, Technology and Environmental Policy (David Bradford) Seminar,* Princeton University, April 16, 2007.

Invited Remarks for Princeton Community Climate-Change Rally, Scudder Plaza, Princeton University, April 14, 2007.

"Getting Serious about Carbon Mitigation," *Invited,* Remarks to Dow Chemical visitors. Princeton University, April 4, 2007.

"Getting Serious about Carbon Mitigation," *Invited, Conference on States and Climate Change,* Sponsored by the Policy Research Institute for the Region (Princeton University) and Environmental Defense, Princeton University, March 30, 2007.

"A Review of CMI," *Contributed, CMI 6th Annual Meeting,* Princeton University, February 20, 2007.

"Energy, Climate, and the Activist Student," *Invited, PEI Advisory Committee,* Princeton University, February 9, 2007.

"Climate Change: Globe, Region, and Educational Opportunities," *Invited,* Environmental Education: Bringing the Lessons Home. The 22nd Annual New Jersey Environmental Education Conference *Alliance for New Jersey Environmental Education.* Mid-Day Plenary Panel. Princeton University, February 2, 2007 (with Roberta Hotinski).

2006

External presentations, 2006

"Brazilian and Petrobras Leadership in Carbon Management," *Invited, Petrobras Business Committee,* Rio de Janeiro, Brazil, October 26, 2006.

"Carbon Sequestration: A Source of Promising 'Stabilization Wedges' for Solving the Climate Problem," *Keynote*, International Seminar on Carbon Sequestration and Climate Change – hosted by *Petrobras,* Rio de Janeiro, Brazil, October 24, 2006.

"Energy and the Global Environment for the Physicist as Researcher and Teacher," *Invited, Rutgers University,* Physics Department, New Brunswick, NJ, October 11, 2006.

Participant in the "Global Warming" panel moderated by Elizabeth Kolbert, *Invited, New Yorker (Magazine) Festival,* October 7, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, World Economic Forum, Industry Partnership Meeting for Energy*, New York City, September 28, 2006.

"A Plan to Keep Carbon in Check," *Invited,* US Congress - Briefing and presentation for *US Senate Staff,* Washington, DC, September 21, 2006.

"Climate Change Technology: Do we need a Manhattan project for the Environment?" *Invited,* US Congress - *Testimony for US House of Representatives,* Committee on Government Reform, Washington, DC, September 21, 2006.

"Carbon Dioxide Capture and Storage and Future U.S. Fuel," *Invited, Defense Science Board, Task Force on DOD Energy Strategy,* Arlington, VA, September 6, 2006.

"The world's climate and energy challenges: A global perspective on innovation and incentives," *Keynote*, ISIS *(International Sustainability Innovation Council of Switzerland),* Zurich, Switzerland, September 1-2, 2006.

"The BP-Ford-Princeton Carbon Mitigation Initiative and the Wedge Model," *Invited, Carson Refinery Visit/BP Visit,* Carson, CA, July 18, 2006.

"Carbon Dioxide Capture and Storage: The New Kid on the Block," *Invited, Solar 2006* – Alternative Future Scenarios for Tackling Climate Change, Denver, CO, July 12, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Keynote, Solar 2006* - Climate Change Action II, Denver, CO, July 12, 2006.

"Energy and the Environment for the Physicist as Researcher and Teacher," *Invited,* Energy Forum, *Aspen Center for Physics*, Aspen, CO, July 10, 2006.

"Confronting Climate Constraints – Sustainable Cities and Ecosystems," *Invited, Aspen Ideas Festival,* Aspen, CO, July 3-9, 2006.

"Welcome", "A Tribute to Amulya Reddy", "A Global View of Energy Challenges," *Invited* (and chair of meeting), InterAcademy Energy Workshop, *InterAcademy Council and Indian National Science Academy,* New Delhi, May 30-31, 2006.

"Technological Options to Stabilize Global CO2 Emissions up to 2050," *Keynote,* First Regional Symposium on Carbon Management, *Saudi Aramco, Dhahran, Saudi Arabia,* May 22, 2006.

"The Urgency of Carbon Mitigation," *Invited, U.S. Senate,* Department of Environmental Forestry and Rural Affairs, Washington, DC, May 10, 2006.

"The Urgency of Carbon Mitigation," *Invited, J.P. Morgan,* New York City, May 9, 2006.
"The Urgency of Energy Efficiency," *Invited,* Rosenfeld Energy Symposium *University of California, Berkeley, CA,* April 28, 2006.

"Stabilization Wedges and the Management of Global Carbon for the Next 50 Years," *Keynote, The Royal Society, London,* UK, April 10, 2006.

"Stabilization Wedges and the Management of Global Carbon for the Next 50 Years," *Invited,* Future of Energy Series, *Harvard University Center for the Environment,* Cambridge, MA, April 5, 2006.

"Stabilization Wedges and the Management of Global Carbon for the Next 50 Years," *Invited, Los Alamos National Laboratory,* Los Alamos, NM, March 23, 2006.

"Living in a Greenhouse: How Far Can Technology Take Us?" *Invited, Harvard Club of Princeton,* Princeton, NJ, March, 12, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Keynote,* World Bank Energy Week, *World Bank,* Washington, DC, March 6, 2006.

"Some Highlights from the Carbon Mitigation Initiative," *Invited, BP Joint University Meeting* – Thought and Leadership in Energy, Cambridge, UK, February 22, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited,* WWF Energy Task Force, *World Wildlife Fund, London,* February 20, 2006.

"Stabilization Wedges: A Challenge to the Social Sciences," *Invited, Center for Advanced Study in the Behavioral Sciences,* Palo Alto, CA, January 9, 2006.

"Stabilization Wedges and the Importance of R&D on Near-Term Options for Carbon Mitigation," *Invited,* InterAcademy Council Energy Workshop, *Lawrence Berkeley National Laboratory,* January 6, 2006.

Presentations at Princeton University and for the local community, 2006

"Living in a Greenhouse," *Invited, Rockefeller College Seminar,* Princeton University, December 7, 2006.

"The Carbon Mitigation Initiative and the Urgency of CCS," *Invited, Presentation to BP Executives,* Tony Hayward and Vivienne Cox, Princeton University, November 17, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, Seminar for AOS graduate students,* Princeton University, November 9, 2006.

"Technology for Living in a Greenhouse," *Invited, MAE Departmental Colloquium,* Princeton University, October 13, 2006.

"The Carbon Mitigation Initiative at Princeton," *Invited, DuPont visit/PRISM Meeting,* Princeton University, October 5, 2006.

"Carbon Capture and Storage," *Invited, National Petroleum Council Meeting,* hosted by Princeton University, October 4, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, WWS Policy Task Force 401c – A Worldwide Phase-Out of Nuclear Power,* Princeton University, September 26, 2006.

Remarks on "National Intelligence Council Workshop on Global Scenarios Relating to Global Climate Change," *Invited, Woodrow Wilson School,* Princeton University, June 7, 2006.

Remarks on "Rising Above the Gathering Storm: Technological Leadership for the 21st Century," *Invited, Princeton Reunions Panel,* Princeton University, June 2, 2006.

"Science and Technology of Alternative Energy Sources," *Invited, Energy, Security, and the Middle East,* Princeton University, April 21, 2006.

Discussant at "Bridging Disciplines, Spanning the World: Approaches to Development, Diversity and Democracy," *Invited, PIIRS Graduate Student Conference 2006,* Princeton University, NJ, April 7, 2006.

"The Carbon Mitigation Initiative: Five Years Back and Five Years Forward," *Contributed, CMI 5th Annual Meeting,* Princeton University, March 2, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, EGR194-MAT 194-PHY194 - EMP*–One (P. Debenedetti's course,**)**, Princeton University, February 27, 2006.

"Stabilization Wedges: Mitigation Tools for the Next Half-Century," *Invited, WWS Policy Task Force 402d* – Energy for Sustainable Development (D. Mauzerall's course), Princeton University, February 15, 2006.