# Feeding the World without Consuming the Planet

*MIT Joint Program on the Science and Policy of Global Change*

***2013 Food Symposium***

***November 5, 2013***

*Confronting global environmental change is one of the greatest challenges of our time. Changes to water, land and climate will affect the future of food and agriculture. The MIT Food Symposium will bring together industry experts and researchers to share their perspectives and gain a better understanding of how research can address these global resource challenges.*

## Food Symposium Agenda

### 2:00-2:45 Climate, Food, Water, Energy Nexus: University Research and Industry Perspectives

*Moderator:* ***Prof. Ronald Prinn*** *– TEPCO Professor of Atmospheric Science, MIT*
*Co-Director, Joint Program on the Science & Policy of Global Change*

*Welcoming Remarks:* ***Prof. Claude R. Canizares*** *– Vice President, Office of the Provost, MIT*

*Opening Remarks:* ***Mr. Paul Conway*** *– Vice Chairman, Cargill, Inc.*

### 2:45-4:00 Agricultural Resources and Inputs

*Moderator:* ***Mr. Loren Cox*** *– Deputy Executive Director for Resource Development,*
*Joint Program on the Science & Policy of Global Change, MIT*

***Dr. John Reilly*** *– Co-Director, Joint Program on the Science & Policy of Global Change, MIT*

***Dr. Michael Rahm*** *– Vice President, Market & Strategic Analysis, The Mosaic Company*

***Dr. Robert Ewing*** *– Director, Strategic Planning, Weyerhaeuser Company*

### 4:00-5:15 Agricultural Commodity Markets, Food and Consumers

*Moderator:* ***Mr. Joshua Hodge*** *– Deputy Executive Director for Resource Development,*
*Joint Program on the Science & Policy of Global Change, MIT*

***Prof. Thomas W. Hertel*** *– Distinguished Professor of Agricultural Economics,*
*Purdue University*

***Mr. Stewart Lindsay*** *– Director, Global Corporate Affairs, Bunge Limited*

***Dr. Ben Jordan*** *– Director, Supplier Sustainability, The Coca-Cola Company*

### 5:15-5:30 MIT View: Unique Contribution to Finding Solutions

***Dr. John Reilly*** *– Co-Director, Joint Program on the Science & Policy of Global Change, MIT*

# Speakers and Moderators

***Claude Canizares*** *is Vice President and the Bruno Rossi Professor of Physics at MIT. He has responsibility for MIT's major international partnerships and oversees the MIT Lincoln Laboratory.*

*Professor Canizares earned his BA, MA and PhD in physics from Harvard University. He came to MIT as a postdoctoral fellow in 1971 and joined the faculty in 1974. He has served as Director of the Center for Space Research (1990-2001), Associate Provost (2001-2006), and most recently as Vice President for Research & Associate Provost (2006-2013). Professor Canizares is a principal investigator on NASA's Chandra X-ray Observatory. He has also worked on several other space astronomy missions and is author or co-author of more than 230 scientific papers.*

*Professor Canizares' service outside MIT includes the Department of Commerce's National Advisory Council on Innovation and Entrepreneurship and the Emerging Technology and Research Advisory Committee, the National Research Council's (NRC) Committee on Science, Technology and the Law, and the National Academy of Sciences Auditing Committee. He served as chair of the NRC's Space Studies Board and was a member of the NASA Advisory Council and the Air Force Scientific Advisory Board, among others. He is also a member of the L-3 Communications, Inc. Board of Directors. Professor Canizares is a member of the National Academy of Sciences and the International Academy of Astronautics and is a fellow of the American Academy of Arts & Sciences, the American Physical Society, and the American Association for the Advancement of Science. He has also received several awards including decoration for Meritorious Civilian Service to the United States Air Force, and two NASA Public Service Medals.*

***Paul Conway*** *serves as Vice Chairman of Cargill. He is a member of the Corporate Leadership Team, the core executive group in charge of Cargill's overall strategy, growth and funding. He was elected to Cargill's Board of Directors in 2008.*

*Conway joined Cargill from law school in 1979 and held a number of merchandising roles in the United Kingdom, USA and Switzerland before becoming a division head of UK corn processing in 1989. Throughout the 1990s he worked in the European processing businesses, becoming executive vice president of Cargill's European food processing businesses in 1997. He served as Cargill's president and regional director in Asia from 2006-2009, and became a Cargill senior vice president and member of its Corporate Leadership Team in 2006.*

*Conway holds degrees from the University of Bristol's School of Law and the Inns of Court School of Law.*

***Loren Cox** is Deputy Executive Director for Resource Development at the Joint Program on the Science and Policy of Global Change. After finishing his MA (U. of Oregon) in 1963, Mr. Cox spent 7 years in Africa and Asia with the U.S. Peace Corps, starting as a Volunteer Leader in Eastern Nigeria, and the last 2 years in Washington, D.C. as Deputy Director, East Asia & Pacific Region. He then worked for 8 years in staff positions with the U.S. House of Representatives, the last 6 as Professional Staff (Energy) with the Ways & Means Committee, where he also was Staff Coordinator.*

*He began work at MIT in 1978 as Executive Director (Director in 1980) of the Center for Energy Policy Research, and from 1980 was a lecturer in the Sloan School of Management. From 1986 to 1994 he was Director for Planning and Research Development for Columbia University's earth sciences research group, the Lamont-Doherty Earth Observatory. In 1995, Mr. Cox returned to MIT as Associate Director for Program Development of the Center for Energy & Environmental Policy Research, and a year later assumed the same role for the Joint Program. He also has wide experience as a consultant on energy markets, environmental strategy and policy matters.*

***Robert Ewing** is the lead strategic planner for Weyerhaeuser Timberlands with responsibilities for properties in the United States, Canada, Uruguay, Brazil and China. His principal goal is to fully utilize the expertise Weyerhaeuser has built up over a century of forest management while positioning the Company to take advantage of the significant changes in the global timberlands and sustainability sectors.*

*Working with corporate and business leaders, Bob helps determine what properties to own, how to manage them, and what business strategies best enable future options. He co-led an internal Company project to establish Weyerhaeuser Solutions—a new business venture targeting energy, material and renewable resource clients. In addition, Bob is the Weyerhaeuser delegate to the World Business Council on Sustainable Development's Vision 2050 project. Prior to joining Weyerhaeuser, Bob worked as a natural resource planner for the State of California. There he had staff responsibilities for the Forest and Rangeland Assessment Program, the California State Board of Forestry and the California Biodiversity Council. Bob has a PhD in Wildland Resource Science and a Masters of Forest Economics from the University of California, Berkeley.*

***Thomas Hertel** is Distinguished Professor of Agricultural Economics at Purdue University, where his research focuses on the economy-wide impacts of global trade and environmental policies. Dr. Hertel is a Fellow, and Past-President, of the Agricultural and Applied Economics Association (AAEA). He is also the founder and Executive Director of the Global Trade Analysis Project (GTAP) which now encompasses more than 10,000 researchers in 150 countries around the world (https://www.gtap.agecon.purdue.edu/). This Project maintains a*

*global economic database and an applied general equilibrium modeling framework which are documented in the book: Global Trade Analysis: Modeling and Applications, edited by Dr. Hertel, and published by Cambridge University Press.*

*Professor Hertel is the inaugural recipient of the Purdue University Research and Scholarship Distinction Award. He has also received a number of awards from the AAEA, including: Quality of Communication, Distinguished Policy Contribution and Outstanding Journal Article.*

***Joshua Hodge** is Deputy Executive Director for Resource Development at the Joint Program on the Science and Policy of Global Change. Prior to joining MIT, Hodge ran the Commodities Research and Forecasts business, Americas, at Thomson Reuters where he managed the launch of the firm's North American power and gas forecast modeling services.*

*Previous to Thomson Reuters, Mr. Hodge was Managing Director, North America, at Point Carbon where he was the firm's first hire in the region and oversaw the launch of Point Carbon's North American products. Joshua holds an MBA from the Darden Graduate School of Business at the University of Virginia.*

***Ben R. Jordan** works as Director of Supplier Sustainability for The Coca-Cola Company. In his 17 years at Coca-Cola, Ben has worked in both its North American and global organizations, traveling in over 30 countries. Ben has held roles focused on both internal operational issues and relationship-building with key stakeholders.*

*Ben has participated actively in Coca-Cola's involvement with a number of leading environmental organizations, including the Coalition for Environmentally Responsible Economies (CERES), World Wildlife Fund (WWF) and The Nature Conservancy. Currently, Ben sits on the Board of the Georgia Conservancy, Georgia Chapter of The Nature Conservancy and Advisory Board of Upper Chattahoochee Riverkeeper.*

*Ben has Bachelor's and Master's degrees from Massachusetts Institute of Technology (MIT) and serves as an Educational Counselor for MIT, interviewing prospective undergraduate students from the Atlanta area. He has a PhD in Public Policy (Environmental Policy specialty) from Georgia Tech. He is an instructor at Emory University and a reviewer for the Journal of Industrial Ecology.*

*Ben lives in Decatur, Georgia, with his wife, Mary Beth, and sons, Jack (7) and Parker (5), where he serves on the City of Decatur Environmental Sustainability Board, helping drive efforts in one of metro Atlanta's most progressive municipalities. He is a member of Druid Hills Golf Club. Ben's childhood on a peach farm in rural Georgia led to his interest in conservation and his career in the environmental field.*

***Stewart Lindsay*** *is the director of global corporate affairs at Bunge Limited (NYSE: BG), an agribusiness and food company that operates in over 40 countries. As director, Stewart oversees all communications and issues management activities at Bunge's global headquarters. Stewart is also responsible for coordinating Bunge's global corporate affairs and sustainability activities. In this capacity he drives strategy development, as well as the creation of on-the-ground efforts and partnerships with NGOs and other groups. He leads high-level external stakeholder relationships and represents Bunge in multi-stakeholder groups, including as a project board member of the World Economic Forum's New Vision for Agriculture.*

*Prior to joining Bunge, Stewart served as a vice president in the corporate and public affairs group of Edelman, where he represented multi-national companies and foreign governments. Stewart holds an MBA from the Kellogg School of Management at Northwestern University and an AB degree in History from Princeton University.*

***Ronald Prinn*** *is a Co-Director of the Joint Program on the Science and Policy of Global Change and the Director of the Center for Global Change Science. In these roles, he works extensively with social scientists to link the science, economics and policy aspects of global change. The MIT Integrated Global System Model, which Professor Prinn co-led the development of, is central to this work.*

*A faculty member at MIT since 1971, Professor Prinn is the TEPCO Professor of Atmospheric Science and headed the MIT Department of Earth, Atmospheric and Planetary Sciences from 1998 to 2003. Along with his work in linking the science, economics and policy aspects of global change, his research interests incorporate the chemistry, dynamics and physics of the atmospheres of the Earth and other planets, and the chemical evolution of atmospheres.*

*Professor Prinn has made significant contributions to the development of national and international scientific research programs in global change. He leads the Advanced Global Atmospheric Gases Experiment (AGAGE), in which the rates of change of the concentrations of the trace gases involved in the greenhouse effect and ozone depletion have been measured continuously over the globe for the past three decades. Through this work he is pioneering the use of inverse methods, which use such measurements and three-dimensional models to determine trace gas emissions and understand atmospheric chemical processes, especially those processes involving the oxidation capacity of the atmosphere. Professor Prinn has also testified twice to the United States Congress on climate change science and its implications for policy, and was a Lead Author in the Fourth Assessment of the Intergovernmental Panel on Climate Change (IPCC) published in 2007. His work is published in more than 200 articles, reports and volume chapters, and he has served in a variety of leadership capacities and committees throughout his career.*

***Michael R. Rahm*** *is responsible for managing and conducting market and strategic analysis for The Mosaic Company. Prior to joining Mosaic, he served as a market analyst for Cargill Crop Nutrition for 19 years and taught economics at Macalester College in St. Paul, Minnesota.*

*Dr. Rahm earned a bachelor's degree in economics and English from Loras College and MS and PhD degrees in agricultural economics from Iowa State University. Dr. Rahm is a member of the Fertilizer Institute's Economics Council and the International Fertilizer Industry Association's Agriculture Committee. He also serves on the board of the Minnesota Council on Economic Education.*

***John Reilly*** *is a Co-Director of the Joint Program on the Science and Policy of Global Change and a Senior Lecturer at the Sloan School of Management. As an energy, environmental and agricultural economist, his research is focused on understanding the role of human activities as a contributor to global environmental change and the effects of environmental change on society and the economy. A key element of his work is the integration of models of the global economy as it represents human activity with models of the ocean, atmosphere and terrestrial vegetation. By understanding the complex interactions of human society with our planet, the goal is to aid in the design of policies that can effectively limit the contribution of human activity to environmental change, to facilitate adaptation to unavoidable change, and to understand the consequences of the deployment of large scale energy systems that will be needed to meet growing energy needs.*

*Focused on the integrated assessment of climate change, Dr. Reilly's work is published in more than 150 articles, reports and volume chapters. He has served in a variety of capacities on the Intergovernmental Panel on Climate Change, was the Co-Chair of the U.S. National Agricultural Assessment on Climate Variability and Change, served on early committees in the Federal Government that shaped the direction of the U.S. Global Change Research Program—along with a wide range of other advisory committees.*

*Prior to joining MIT in 1998, Dr. Reilly spent 15 years with the U.S. Department of Agriculture's Economic Research Service, and previously for the Pacific Northwest National Laboratory and the Institute for Energy Analysis, Oak Ridge Associated Universities. He has a PhD (1983) and MS (1980) in economics from the University of Pennsylvania, and a BS (1978) from the University of Wisconsin.*

## Science & Policy Working Together

The Joint Program on the Science and Policy of Global Change is MIT's response to the research, analysis and communication challenges of climate change. The Program combines scientific research with policy analysis to provide an independent, integrative assessment of the impacts of global change and how best to respond.

The Joint Program is made up of a team of close-working specialists from a wide range of disciplines. It combines the efforts and expertise of two complementary MIT research centers—the ***Center for Global Change Science (CGCS)*** and the ***Center for Energy and Environmental Policy Research (CEEPR)***—and collaborates with other MIT departments, leading research institutions and nonprofit organizations worldwide.

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