



# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## Conference Agenda

September 27–28, 2010

### Doré Commons

James A. Baker III Hall  
Rice University  
Houston, Texas

**energyforum**  
James A. Baker III Institute for Public Policy • Rice University

**ConocoPhillips**

**BAKER BOTTS**  **LLP**



# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Organizing Partners*

### **Baker Institute Energy Forum**

Located in Houston, Texas, the energy capital of the world, the James A. Baker III Institute for Public Policy has created a multifaceted program designed to promote original, forward-looking discussion and research on the energy-related challenges facing our society in the 21st century. The mission of the Energy Forum is to shed light on important trends – both regional and global – that shape the nature of global energy markets and influence the quantity and security of vital supplies needed to fuel world economic growth and prosperity. The choice of the word “forum” is deliberate. It reflects our goal to serve as a focal point for the exchange of ideas on how to improve understanding of the complex political, cultural, religious, economic and social forces that influence open access to energy resources and their equitable distribution.

### **James A. Baker III Institute for Public Policy, Rice University**

The mission of the Baker Institute is to help bridge the gap between the theory and practice of public policy by drawing together experts from academia, government, media, business and nongovernmental organizations. By involving policymakers and scholars, as well as students (tomorrow’s policymakers and scholars), the institute seeks to improve the debate on selected public policy issues and to make a difference in the formulation, implementation and evaluation of public policy, both domestic and international. The Baker Institute is an integral part of Rice University, one of the nation’s most distinguished institutions of higher education. The efforts of Baker Institute fellows and affiliated Rice faculty focus on several ongoing research projects, details of which can be found on the institute’s website, <http://bakerinstitute.org>.

## *Sponsors*

Support for this conference was generously provided by ConocoPhillips.



Additional support for the luncheon was provided by Baker Botts L.L.P.



# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *About the Conference*

### Energy Market Consequences of an Emerging U.S. Carbon Management Policy

Emerging energy and climate policies in the United States are accelerating the pace of technological changes and prompting calls for alternative energy and stricter energy efficiency measures. These trends raise questions about the future demand for fossil fuels, such that some energy-producing nations are reluctant to invest heavily in the expansion of production capacity. The abundance of shale gas resources in North America could allow the United States to utilize more gas in its energy mix as a means of enhancing energy security and reducing carbon dioxide emissions. However, this will only occur if U.S. policies promote and allow the benefits provided by natural gas to be realized. To examine these issues and the emerging trends in U.S. energy and climate policy, the Baker Institute is holding a major international conference, titled “Energy Market Consequences of an Emerging U.S. Carbon Management Policy.” At this event, the institute will unveil findings from a major study investigating the North American and global oil and natural gas market consequences of emerging U.S. policies to regulate greenhouse gas emissions, as well as the potential role of alternative energy in the U.S. economy.

## *Conference Agenda – Day 1*

### Welcoming Remarks

9:00 am      **The Honorable Edward P. Djerejian**  
Founding Director, James A. Baker III Institute for Public Policy

### Opening Keynotes

9:15 am      **Her Excellency Diezani Alison-Madueke**  
Minister of Petroleum Resources, Federal Republic of Nigeria

**James Mulva**  
Chairman and CEO, ConocoPhillips

10:30 am      Coffee Break

10:45 am      The Future of Climate Change Policy  
**Robert Stavins, Ph.D.**  
Albert Pratt Professor of Business and Government, Harvard Kennedy School, and  
Director, Harvard Environmental Economics Program, Harvard University

11:15 am      Blue Skies, Plug-in Vehicles and Petroleum’s Future  
**Felix Kramer**  
Founder, California Cars Initiative

### Baker Institute Study Overview

11:45 am      Energy Market Consequences of an Emerging U.S. Carbon Management Policy — Key Findings  
**Amy Myers Jaffe**  
Wallace S. Wilson Fellow in Energy Studies, James A. Baker III Institute for Public Policy

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Conference Agenda – Day 1 (continued)*

### Lunch

12:15 pm      Grand Hall, Ley Student Center

### Baker Institute Study Presentations: Renewable Energy in the United States

1:30 pm      Quantitative Analysis of Scenarios for Emerging Renewable Energy in the United States

**Kenneth B. Medlock III, Ph.D.**

James A. Baker, III, and Susan G. Baker Fellow in Energy and Resource Economics,  
James A. Baker III Institute for Public Policy

R&D in Energy and Growth in the U.S. Economy

**Ted Temzelides, Ph.D.**

Baker Institute Rice Scholar and Professor of Economics, Rice University

Wind Power in the United States: Prospects and Consequences

**Peter R. Hartley, Ph.D.**

Baker Institute Rice Scholar and George and Cynthia Mitchell Professor of Economics, Rice University

3:00 pm      Break

### Afternoon Keynote

3:30 pm

**Masakazu Toyoda**

Chairman and CEO, The Institute of Energy Economics, Japan

### Baker Institute Study Presentations: International Trade Issues

4:00 pm

The History and Politics of U.S. Relations with OPEC, and New Trends in U.S. Policy and Their Impact on Oil Geopolitics, Supply and Pricing

**Amy Myers Jaffe**

Wallace S. Wilson Fellow in Energy Studies, James A. Baker III Institute for Public Policy

Implications of Offshoring Carbon Emissions for Climate Policy

**Robert Harriss, Ph.D.**

President and CEO, Houston Advanced Research Center

Financial Imbalances, Middle East Industrialization, and Carbon Dioxide Emissions

**Mahmoud A. El-Gamal, Ph.D.**

Will Clayton Fellow in International Economics, James A. Baker III Institute for Public Policy,  
Chair of Islamic Economics, Finance and Management, and Chair, Department of Economics,  
Rice University

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## Conference Agenda — Day 2

### Welcoming Remarks

9:00 am **Amy Myers Jaffe**  
Wallace S. Wilson Fellow in Energy Studies, James A. Baker III Institute for Public Policy

### Opening Keynote

9:10 am **Edward Morse, Ph.D.**  
Managing Director and Head of Global Commodities Research, Credit Suisse

### Baker Institute Study Presentations: North American and Global Natural Gas Outlook

9:45 am Impact of an Emerging U.S. Carbon Policy on Global Natural Gas Markets  
**Kenneth B. Medlock III, Ph.D.**  
James A. Baker, III, and Susan G. Baker Fellow in Energy and Resource Economics,  
James A. Baker III Institute for Public Policy

10:30 am Coffee Break

10:45 am Emerging U.S. Climate Policy and Its Impact on U.S. Trade and Foreign Policy  
**Joe Barnes**  
Bonner Means Baker Fellow, James A. Baker III Institute for Public Policy

Carbon Management in Asia: The Role of the United States and Japan  
**Yoshikazu Kobayashi**  
Leader, Oil Group, The Institute of Energy Economics, Japan

### Lunch

11:45 am Grand Hall, Ley Student Center

### Afternoon Keynote

1:15 pm The Role of Public Transportation in U.S. Energy Policy  
**Joshua Schank, Ph.D.**  
Director of Transportation Research, Bipartisan Policy Center

### Baker Institute Study Presentations: Gasoline Policy

1:45 pm (Un?)Happiness and Gasoline Prices in the United States  
**Soumya Chattopadhyay**  
Adjunct Professor, School of Public Policy, The University of Maryland; Senior Research Analyst,  
Foreign Policy Program and Global Economy and Development Program, The Brookings Institution

**James Coan**  
Energy Forum Research Associate, James A. Baker III Institute for Public Policy

Lithium in Bolivia: Can Resource Nationalism Deliver for Bolivians and the World?  
**David R. Mares, Ph.D.**  
Baker Institute Scholar for Latin American Energy Studies, James A. Baker III Institute for Public Policy

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Conference Agenda – Day 2 (continued)*

### Role of the EPA in U.S. Energy and Climate Policy

2:30 pm

**William Bumpers**

Partner, Baker Botts L.L.P.

**The Honorable Stephen L. Johnson**

President and CEO, Stephen L. Johnson and Associates Strategic Consulting, LLC;  
Administrator, U.S. Environmental Protection Agency, 2005–2009

**Jake Caldwell**

Director of Policy for Agriculture, Trade and Energy, Center for American Progress

### Closing Remarks

4:00 pm

**Amy Myers Jaffe**

Wallace S. Wilson Fellow in Energy Studies, James A. Baker III Institute for Public Policy

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Participant Biographies*

**Her Excellency Diezani Alison-Madueke** is the minister of petroleum resources of the Federal Republic of Nigeria. She is driving reforms in the oil and gas sector with the proposed Petroleum Industry Bill, soon to be passed into law. She has also initiated policies to aggressively implement the Gas Master Plan with a view to assuring Nigeria takes its rightful place in the evolving global gas market. As part of this project, Alison-Madueke initiated new gas pricing regimes for the gas-to-power and gas-to-manufacturing industry subsectors to stimulate investments in the gas sector, as well as to expedite growth of the power and manufacturing sectors. Previously, Alison-Madueke worked at Shell Petroleum Development Company, joining in 1992 as head of the project unit of the Estate Development Division in Lagos. She was later appointed external affairs director, and was the first female to be appointed a member of the board of directors at Shell's office in Nigeria. Alison-Madueke studied architecture at Howard University in Washington, D.C., and began her working career at Charles Szoradi Architects, later moving to American Interior Builders Inc. as a project engineer.

**Joe Barnes** is the Bonner Means Baker Fellow at the Baker Institute. Since coming to Rice University in 1995, he has written extensively on international economics, with a focus on the geopolitics of energy. In addition to numerous institute studies, Barnes' work has also appeared in *The New York Times*, *The Houston Chronicle*, *Survival*, *Oil and Gas Journal*, *Energy Markets*, the Newsletter of the Royal United Services Institute, the SAIS Policy Forum Series and the *National Interest*. He is a contributor to three volumes: "Energy in the Caspian Region" (Palgrave Press), "United States Tax Reform in the 21st Century" (Cambridge University Press) and "Natural Gas and Geopolitics from 1970 to 2040" (Cambridge University Press). Barnes is also faculty adviser to the Baker Institute Student Forum. From 1979 to 1993, he was a career diplomat with the U.S. State Department, serving in Europe, Africa, the Middle East and South Asia. His last assignment in the State Department was with the policy planning staff. Barnes is a graduate of Princeton University.

**William Bumpers** is a partner with Baker Botts L.L.P. in Washington, D.C., where he heads Baker Botts' Global Climate Practice. Bumpers' practice focuses on climate change and Clean Air Act issues, particularly as they affect the energy industry. He advises a wide range of clients, including electricity-generating, renewable energy and international energy companies; carbon offset developers; investment banking firms; and carbon exchanges. Bumpers has been actively involved with climate change law and policy since 1992, when the United States ratified the United Nations Framework Convention on Climate Change. He worked with electric utility companies in the early 1990s to negotiate climate accords with the Department of Energy pursuant to the U.S. National Action Plan on Climate Change. In 1994, he helped structure the first "inter-pollutant" trade in the United States, involving carbon dioxide emissions reductions in exchange for sulfur dioxide allowances. Bumpers has assisted both The World Bank Group and the International Finance Corporation with their early stage development of climate change instruments and transactions. He has been involved with emission reduction projects around the world, including clean development mechanism projects in Africa, Brazil, Argentina and Malaysia; joint implementation projects in Russia; and numerous voluntary emission reduction projects in the United States. His work has included the structuring of projects, as well as drafting emission reduction purchase agreements, trust agreements, investment agreements, exclusive greenhouse gas credit management agreements and construction contracts.



# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

**Jake Caldwell** is the director of policy for agriculture, trade and energy at the Center for American Progress. Prior to joining American Progress, he served most recently as the program director for trade and the environment at the National Wildlife Federation. Since 1991, he has been actively involved in the development of trade and environment policy and has written extensively on the relationship between trade, environment and development. Caldwell is an adjunct professor of law at The University of Maryland School of Law, where he teaches a seminar course on the environment and world trade. He also works with American Progress' Resources for Global Growth program, which focuses on the linkages between agriculture, trade and energy policy in the United States, and efforts to enhance national security and alleviate global poverty. Caldwell received a B.A. from McGill University and a J.D. from The University of Maryland School of Law, where he served as editor-in-chief of the Maryland Journal of International Law and Trade.

**Soumya Chattopadhyay** is a senior research analyst at The Brookings Institution. He is also an adjunct professor and a doctoral candidate at the School of Public Policy of The University of Maryland. Prior to this, he worked at The World Bank's Finance, Private Sector Development and Infrastructure Group, as well as with the Development Economics Research Group. He has also worked for the Unilever group of companies. He has been a contributing editor to the Journal of Public and International Affairs at Princeton University's Woodrow Wilson School of Public and International Affairs. His recent research has focused on the impact of international trade and economic events on individual well-being and perceived economic prospects. Chattopadhyay has a B.A. in economics from St. Stephen's College, University of Delhi; a B.A. in economics from the University of Cambridge; an M.A. in economics and a Master of Public Management from The University of Maryland.

**James Coan** is a research associate for the Energy Forum at the Baker Institute. His research interests include renewable energy, U.S. strategic energy policy and international relations. Coan has previously interned at the Energy and National Security Program of the Center for Strategic and International Studies, the Transportation Program of the American Council for an Energy-Efficient Economy, and Sentech Inc., an alternative energy consulting firm. In 2008, Coan was a winner in the Presidential Forum on Renewable Energy essay contest. He also was awarded second place two years in a row in The Brookings Institution Hamilton Project Economic Policy Innovation Prize Competition for proposals concerning coal-to-liquids fuel (2007) and a program similar to the "Cash for Clunkers" idea approved by Congress (2008). Coan graduated cum laude with a Bachelor of Arts from the Woodrow Wilson School of Public and International Affairs at Princeton University and received a certificate in environmental studies. His thesis estimated the impact of an oil shock on subjective well-being, a measure of happiness and life satisfaction, in the United States.

**The Honorable Edward P. Djerejian** is the founding director of the James A. Baker III Institute for Public Policy. He served both President George H.W. Bush and President William J. Clinton as assistant secretary of state for Near Eastern affairs and Presidents Ronald Reagan and Bush as U.S. ambassador to Syria. He served President Clinton as U.S. ambassador to Israel before completing his foreign service career in 1994. He also served President Reagan as special assistant and deputy press secretary for foreign affairs. He has been awarded the Presidential Distinguished Service Award, the Department of State's Distinguished Honor Award and numerous other honors, including the Ellis Island Medal of Honor and the Anti-Defamation League's Moral Statesman Award.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Participant Biographies (continued)*

**Mahmoud A. El-Gamal, Ph.D.**, is the Will Clayton Fellow in International Economics at the Baker Institute. He also is the chair of and a professor in the Department of Economics at Rice University, where he also holds the endowed Chair in Islamic Economics, Finance and Management. Before joining Rice in 1998, he was an associate professor of economics at the University of Wisconsin–Madison. He has also worked as an assistant professor at the University of Rochester and the California Institute of Technology; as an economist at the Middle East department of the International Monetary Fund (1995–96); and as the first scholar in residence on Islamic finance at the U.S. Department of Treasury (2004). El-Gamal has published extensively on finance, econometrics, decision science, economics of the Middle East and Islamic transactions law. His recent books include “Islamic Finance: Law, Economics, and Practice” (Cambridge University Press, 2006) and “Oil, Dollars, Debt, and Crises: The Global Curse of Black Gold” with Amy Myers Jaffe (Cambridge University Press, 2010).

**Robert Harriss, Ph.D.**, is president and CEO of the Houston Advanced Research Center (HARC). He is also adjunct professor of earth and atmospheric sciences at The University of Houston; adjunct professor of marine sciences at Texas A&M University at Galveston; and fellow at the Institute for Science, Technology and Public Policy of Texas A&M University’s Bush School of Government and Public Service. His professional interests focus on sustainability science, engineering, education and policy. Harriss was formerly senior scientist and director of the Institute for the Study of Society and the Environment at the National Center for Atmospheric Research in Boulder, Colo. Prior positions also include a Harvard University postdoctoral fellowship and faculty appointments at McMaster University (Canada), Florida State University, University of New Hampshire, Texas A&M University and the University of Colorado. He also served 10 years as a senior scientist in ocean and atmospheric sciences at the NASA Langley Research Center and three years as science director for the Mission to Planet Earth Program at NASA Headquarters in Washington, D.C. Harriss obtained a B.S. in geology from Florida State University and a Ph.D. in geochemistry from Rice University.

**Peter R. Hartley, Ph.D.**, is a Baker Institute Rice scholar, as well as the George and Cynthia Mitchell Chair in Sustainable Development and Environmental Economics and professor of economics at Rice University. From 1980 to 1986, Hartley was an assistant professor of economics at Princeton University. He moved to Rice University as an associate professor of economics in August 1986 and was promoted to full professor in 1993. He was chair of the Department of Economics at Rice from 2000 to 2005, and was awarded the George and Cynthia Mitchell Chair in 2007, when he was also appointed as academic director of the Shell Center for Sustainability. Hartley’s research has covered a number of areas, but has recently focused on energy economics. He has also been involved in public policy debates and as an adviser to governments and private firms on energy and environmental issues. Hartley completed an honors degree in mathematics in 1974 and a master’s degree in economics in 1977 at The Australian National University. He worked for the Priorities Review Staff and the Economic Division of the Prime Minister’s Department in the Australian government before coming to study at The University of Chicago, where he obtained a Ph.D. in economics in 1980.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

**Amy Myers Jaffe** is the Wallace S. Wilson Fellow in Energy Studies and director of the Energy Forum at the Baker Institute, as well as associate director of the Rice Energy Program. Jaffe's research focuses on oil geopolitics, strategic energy policy including energy science policy, and energy economics. Jaffe was formerly senior editor and Middle East analyst for Petroleum Intelligence Weekly. She is widely published and served as co-editor of "Energy in the Caspian Region: Present and Future" (Palgrave, 2002) and "Natural Gas and Geopolitics: From 1970 to 2040" (Cambridge University Press, 2006), and as co-author of "Oil, Dollars, Debt, and Crises: The Global Curse of Black Gold" with Mahmoud A. El-Gamal (Cambridge University Press, 2010). Jaffe also contributed to Foreign Policy's "21 Solutions to Save the World" (May/June 2007). She served as a member of the reconstruction and economy working group of the Baker/Hamilton Iraq Study Group, as project director for the Baker Institute/Council on Foreign Relations Task Force on Strategic Energy Policy, and as a principal adviser to USAID's project on "Options for Developing a Long Term Sustainable Iraqi Oil Industry." She currently serves as a strategic adviser to the American Automobile Association (AAA) of the United States and is a member of the Council on Foreign Relations. Jaffe was among the Key Women in Energy–Americas honorees in the Pathfinders/Trailblazers category (2004), the honoree for Esquire's annual 100 Best and Brightest in the contribution to society category (2005), Elle magazine's Women for the Environment (2006), and was named to Who's Who in America (2008). Jaffe is a Princeton University graduate with a degree in Arabic studies.

**The Honorable Stephen L. Johnson** is the president and CEO of Stephen L. Johnson and Associates Strategic Consulting, LLC. Johnson served in the federal government for 28 years, which culminated in being administrator of the U.S. Environmental Protection Agency (EPA) from 2006 to 2009. He was responsible for 17,500 staff and an annual budget of \$7.5 billion. Johnson was the first scientist and career federal employee to ever be appointed administrator. During his tenure, he promulgated the most health-protective air standards for ozone, soot and lead in U.S. history. Among his many achievements were the establishment of the first National Homeland Security Research Center, the first renewable fuel standard, the first water efficiency consumer label and certification program (water sense), and the establishment of the United States as the first nation in the world to review all pesticides in food, setting stringent standards for children's health. Under Johnson's leadership, the agency pursued an aggressive enforcement program resulting in a record \$51 billion in commitments from polluters. Additionally, the EPA received national recognition as one of the top 10 places to work in government. He has received numerous national and international awards including the Presidential Rank Award for distinguished executives, the highest award that can be given to a civilian federal employee. Johnson holds a B.A. in biology from Taylor University, an M.S. in pathology from The George Washington University and honorary doctorates from Virginia Wesleyan University and Taylor University.

**Yoshikazu Kobayashi** is the leader of Oil Group at The Institute of Energy Economics, Japan (IEEJ). At IEEJ, he is responsible for the research on the world oil and gas market and energy security issues in Northeast Asia. Previously, he was an analyst at Tonen General Sekiyu, an ExxonMobil-affiliated company in Japan covering refinery operation planning and marine transportation. He received his B.A. in social sciences from Hitotsubashi University and his M.A. in international relations and economics from The Johns Hopkins School of Advanced International Studies.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Participant Biographies (continued)*

**Felix Kramer**, founder of the California Car Initiative (CalCars.org), is an entrepreneur and lifelong environmentalist focusing on innovative technology-related ideas, events and businesses. In 2002, he enlisted engineers, entrepreneurs, environmentalists and drivers to promote plug-in hybrids by technology demonstrations, advocacy and buyer demand. In 2006, he became the world's first nontechnical consumer owner of a plug-in vehicle. He popularized the "100+MPG" goal and "cleaner/cheaper/domestic" to describe electricity's benefits. In late 2009, while noting much remained to be done, CalCars "declared victory" on plug-ins. Thomas Friedman, in his best-seller "Hot Flat and Crowded," said, "Felix Kramer has made plug-in electric cars not only his passion but an imminent American reality." With allies including Andy Grove, Kramer is forging a technical, business and government coalition to spark a new industry to retrofit the millions of large internal combustion engine vehicles now on the road into safe, practical, plug-ins and electric vehicles. In 2008, he began advising several transportation electrification and conversion startups. A graduate of Cornell University, Kramer lives in California's Silicon Valley.

**David R. Mares, Ph.D.**, is the Baker Institute Scholar for Energy Studies and a professor of political science and adjunct professor at the Graduate School of International Relations and Pacific Studies at the University of California, San Diego. Mares previously was profesor-investigador at El Colegio de México (1980-82), Fulbright Professor at the Universidad de Chile (1990) and visiting professor at the Diplomatic Academy in Ecuador (1995). He has been a visiting scholar at the Weatherhead Center for International Affairs, Harvard University; a fellow at the Japan External Trade Research Organization (JETRO); a fellow at the Center for Advanced Study in the Behavioral Sciences (CASBS), Stanford University; and held a Pew Faculty Fellowship in International Affairs. His research and teaching interests include Latin American energy politics, the political economy of drug policy, defense policy, civil-military relations and the use of photographic imagery in politics. Mares has published many books and articles in numerous journals in the Americas and Europe. He is editor of the series "Latin America: Social Sciences and the Law" (Routledge Press) and was a member of the international advisory board of the Instituto Latinoamericano de Relaciones Civiles-Militares (Peru), as well as of the editorial board of Latin American Research Review. He has prepared reports for a number of international research institutions, and he is an associate fellow of the Inter-American Dialogue (Washington, D.C.), a fellow of the academic forum of the Summit of the Americas (Montreal, Canada), and a member of the Tri-national Academic Group on Governance in North America (Monterrey, Mexico). He earned his Ph.D. from Harvard University in 1982.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

**Kenneth B. Medlock III, Ph.D.**, is the James A. Baker, III, and Susan G. Baker Fellow in Energy and Resource Economics at the Baker Institute and adjunct professor in the Rice University Department of Economics. Medlock leads the Baker Institute Energy Forum's natural gas program. He is a principal in the development of the Rice World Natural Gas Trade Model, aimed at assessing the future of international natural gas trade. He also teaches introductory and advanced courses in energy economics. Medlock's research covers a wide range of topics in energy economics and has been published in numerous academic journals, book chapters and industry periodicals, as well as in various Energy Forum studies. He is a member of the International Association of Energy Economics (IAEE), and in 2001 he won (joint with Ron Soligo) the IAEE Award for Best Paper of the Year in the Energy Journal. Medlock has served as an adviser to the Department of Energy in its energy modeling efforts and is a regular participant in Stanford University's Energy Modeling Forum. Medlock was the lead modeler of the Modeling Subgroup of the 2003 National Petroleum Council (NPC) study of North American natural gas markets, was a contributing author to the California Energy Commission's and Western Interstate Energy Board's "Western Natural Gas Assessment" in 2005, and contributed to the 2007 NPC study, "Facing the Hard Truths." Medlock received a Ph.D. in economics from Rice in 2000 and was the Baker Institute's M. D. Anderson Fellow from 2000 to 2001. Afterward, he held the position of corporate consultant at El Paso Energy Corporation.

**Edward Morse, Ph.D.**, is managing director and the head of Global Commodities Research at Credit Suisse in New York. He previously held similar positions at Lehman Brothers and Louis Capital Markets. Widely cited in the media, he is a contributor to journals such as Foreign Affairs, Financial Times, The New York Times and the Washington Post. He worked in the U.S. government at the State Department, and later was an adviser to the United Nations Compensation Commission on Iraq, as well as to the U.S. Departments of State, Energy and Defense, and to the International Energy Agency on issues related to oil, natural gas and the impact of financial flows on energy prices. A former Princeton professor and author of numerous books and articles on energy, economics and international affairs, Morse was the publisher of Petroleum Intelligence Weekly and other trade periodicals and also worked at Hess Energy Trading Co.

**James Mulva** is chairman and CEO of ConocoPhillips. Previously, he served as president and CEO of ConocoPhillips from 2002 to 2004. He also served as chairman and CEO of Phillips Petroleum Company from 1999 to 2002, and as Phillips' president and chief operating officer since May 1994 and executive vice president since January 1994. He had been senior vice president in 1993 and chief financial officer since 1990, at which time he joined the company's management committee. Mulva currently serves as a director for General Electric. He also is a member of The Business Council, as well as the board of visitors for the M. D. Anderson Cancer Center in Houston. He graduated from The University of Texas with a bachelor's degree and a master's degree in business administration finance. Immediately after graduating, Mulva served as a U.S. Navy officer until beginning his career with Phillips in 1973.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

## *Participant Biographies (continued)*

**Joshua Schank, Ph.D.**, is the director of transportation research at the Bipartisan Policy Center. He joined the National Transportation Policy Project in 2007. An urban planner who has been working on federal and state transportation policy for the last 10 years, Schank previously worked as a consultant with Parsons Brinckerhoff, one of the world's largest transportation planning and engineering firms. He was also the transportation policy adviser to Sen. Hillary Clinton, D-N.Y., working on the most recent reauthorization of the surface transportation bill (SAFETEA-LU). Schank has also worked as an analyst at the U.S. Department of Transportation Office of the Inspector General, and as a transportation planner at the Metropolitan Transportation Authority in New York City. He has published numerous articles on transportation policy and planning, and his first book, "All Roads Lead to Congress: The \$300 Billion Fight over Highway Funding," was published in October 2007. He has a Ph.D. in urban planning from Columbia University, a Master of City Planning from the Massachusetts Institute of Technology, and a B.A. in urban studies from Columbia University.

**Robert Stavins, Ph.D.**, is the Albert Pratt Professor of Business and Government at the Harvard Kennedy School, director of the Harvard Environmental Economics Program, chairman of the Environment and Natural Resources Faculty Group, director of graduate studies for the Doctoral Program in Public Policy and the Doctoral Program in Political Economy and Government, co-chair of the Harvard Business School-Kennedy School Joint Degree Programs, and director of the Harvard Project on International Climate Agreements. He is a university fellow of Resources for the Future, a research associate of the National Bureau of Economic Research, co-editor of the Review of Environmental Economics and Policy, and a member of the board of directors of Resources for the Future, the scientific advisory board of the Fondazione Eni Enrico Mattei, the board of academic advisers of the AEI-Brookings Joint Center for Regulatory Studies, the editorial boards of Resource and Energy Economics, Climate Change Economics, Environmental Economics Abstracts, B.E. Journals of Economic Analysis & Policy, Economic Issues, and Environmental Economics and Policy Studies. He is also an editor of the Journal of Wine Economics, and is the chair of the Expert Advisory Board of the Harvard Alumni Alliance for the Environment. Prior to coming to Harvard, Stavins was a staff economist at the Environmental Defense Fund; and before that, he managed irrigation development in the Middle East, and spent four years working in agricultural extension in West Africa as a Peace Corps volunteer.

**Ted Temzelides, Ph.D.**, is a professor of economics, a Baker Institute Rice scholar and the master of Martel College at Rice University. Before coming to Rice, Temzelides taught at the University of Minnesota, the Tippie College of Business at The University of Iowa, the University of Pittsburgh and The Wharton School of business at the University of Pennsylvania. He has consulted for the Federal Reserve as well as the European Central Bank. His research concentrates on macroeconomics and energy economics; he currently studies the effect of R&D in renewable energy sources on economic growth and the design of emissions trading mechanisms. Temzelides' research has received funding from the National Science Foundation and has been published in some of the leading academic journals in economics, including Econometrica, the Journal of Political Economy, the American Economic Review: Papers and Proceedings, and the Journal of Monetary Economics. Temzelides regularly serves as a referee for academic journals and is on the editorial board of the journal Economic Theory. He earned a bachelor's degree in economics in Greece and a doctorate in economics from the University of Minnesota.

# ENERGY MARKET CONSEQUENCES OF AN EMERGING U.S. CARBON MANAGEMENT POLICY

**Masakazu Toyoda** is the chairman and CEO of The Institute of Energy Economics, Japan (IEEJ). Toyoda began his career in 1975 in the petroleum — and later, in the alternative energy — departments of the Energy and Resources Agency, moving to the International Energy Agency in 1983. Additionally, he has been actively involved with the International Trade Policy Bureau, at various times between 1987 and 2001 holding positions such as director of international trade policy planning, director of the Tariff Division of the International Economic Affairs Department, director of the Americas Division, director-general of the International Economic Affairs Department and director-general of the Multilateral Trade System Department. In 2002, he became director-general for manufacturing industries policy. The following year, he was named the director-general of the Commerce and Information Policy Bureau. In 2006, Toyoda became the director-general of the Trade Policy Bureau and was made vice minister for international affairs the following year. During this period in charge of trade policy, he made substantial contributions to create APEC, conclude the Uruguay Round, resolve U.S./Japan auto trade disputes and launch the Doha developmental round. In 2008, he became secretary-general at the Secretariat of Strategic Headquarters for Space Policy. He has served as an adviser to Sonpo, Japan, and special adviser to the cabinets on the Asian economy and climate change. Before assuming his duties as IEEJ chairman, Toyoda was a statutory auditor for the Murata Manufacturing Company. He holds a bachelor's degree in law from the University of Tokyo, and a master's degree in public affairs from The Woodrow Wilson School of Public and International Affairs at Princeton University.