



ENERGY TECHNOLOGY R&D AND INTELLECTUAL PROPERTY IN THE NEW "GREEN" ECONOMY

Tuesday, January 26, 2010

Doré Commons
James A. Baker III Hall
Rice University

ENERGYforum

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

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

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About the Event

Energy Technology R&D and Intellectual Property in the New "Green" Economy

Change and innovation are unfolding at a rapid pace in the energy sector, with an influx of new entrepreneurial players entering the marketplace with capital, novel investment and business models, and differing regulatory experiences than traditional oil and gas industry practices. While initially the domain of small startup firms, the Clean Tech marketplace now includes venture capital firms, wealthy oil-rich Middle East governments, information technology (IT) giants and major oil companies. These investors and businesses are increasingly questioning how best to leverage the lessons, skills and business paradigms that ushered the success of the "Silicon Valley model" to propel similar achievements in the Clean Tech sector.

This conference will focus on the barrier of creative destruction in the business of energy technology innovation and discuss solutions from the IT world that might guide and inform pathways to successful innovation and business development of new energy solutions. It brings together industry practitioners from both the oil and gas sector and the emerging Clean Tech sector, with academic, government and legal specialists, to discuss the strategic pathways related to adapting, leveraging and using new technology and intellectual property in the emerging "green" economy.

Conference Agenda

Opening Remarks

10:00 am **Amy Myers Jaffe**
Wallace S. Wilson Fellow in Energy Studies, Baker Institute for Public Policy

Morning Session

10:10 am Energy R&D and the Problem of Creative Destruction
Ted Temzelides, Ph.D.
Professor of Economics, Rice University

10:45 am Renewable Energy and the Evolving Power Industry Structure
Joseph Peters, P.E.
Senior Consultant, Black & Veatch

Lunch

11:30 am Accelerating Energy Innovation
Matthew Rogers
Senior Adviser to the U.S. Secretary of Energy for Recovery Act Implementation

Afternoon Session I: Patent Pools in Energy R&D

1:00 pm Strategic Considerations for Standards Setting Organizations and Patent Pools
Mark Spolyar
Partner, Baker Botts L.L.P.

The Pecan Street Project: A Smart Grid Demonstration in Austin, Texas
Michael Webber, Ph.D.

Associate Director, Center for International Energy and Environmental Policy in the Jackson School of Geosciences, The University of Texas at Austin; Co-Director, Clean Energy Incubator

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Conference Agenda (continued)

If Energy is the Question, is Nanotechnology the Answer?

Andrew R. Barron, Ph.D.

Charles W. Duncan, Jr. – Welch Chair of Chemistry and Professor of Materials Science, Rice University

2:30 pm Coffee Break

Afternoon Session II: Impact of Disruptive Technologies in Energy

Moderator: Antonio Coutinho, Chief Energy Management Officer, Horizon Wind Energy

2:45 pm Technology in Electricity: Shaping a Different Future

Antonio Coutinho

Chief Energy Management Officer, Horizon Wind Energy

The Global Unconventional Gas Trend

Robert G. Clarke

Manager, Unconventional Gas Service, Wood MacKenzie

Betting on Science: Disruptive Technologies in Transport Fuels

Melissa Stark

Partner, Clean Energy Lead, Accenture

Utilizing the LaBarge Experience to Support the Global Development of CCS

Michael E. Parker, P.E.

Technical Adviser, Upstream Safety, Health and Environment, ExxonMobil Production Company

Electrified Vehicles' Role in the Climate Challenge

Derek Lemoine

Ph.D. Candidate, University of California, Berkeley

Closing Remarks

5:00 pm

Amy Myers Jaffe

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

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Participant Biographies

Andrew R. Barron, Ph.D., is the Charles W. Duncan, Jr.–Welch Chair of Chemistry and a professor of materials science at Rice University. He has published more than 360 scientific papers and has more than 30 patents worldwide. His group's research involves the application of nanotechnology to energy and health research. Since 2002, the focus of research within Barron's research group has been on carbon materials; however, his research has led the way in large-scale production of ceramic nanomaterials and in the application in several energy-related programs. His research has been at the forefront of understanding the health benefits and risks of nanomaterials. Barron's work has resulted in the creation of four companies in the areas of solar power, enhanced oil and gas recovery, and carbon dioxide sequestration, one of which (NatCore) is the first Rice startup to become a publically traded company. Barron was recently named the first "Prince of Wales Visiting Innovator." He created the first educational programs at Rice to span the Schools of Science, Engineering and Management, and has been involved in the direction of the Rice Alliance for Entrepreneurship since its inception. He is also actively involved with educational programs in collaboration with the Rice section of the Society of Automotive Engineers. He received his B.Sc. and Ph.D. from Imperial College of Science and Technology, University of London.

Robert G. Clarke is currently manager of Wood Mackenzie's Unconventional Gas Service. He has been with Wood Mackenzie since 2005, originally as a member of the company's U.S. Lower 48 Upstream Research team. He has covered both the Rocky Mountain and Gulf Coast regions, and he led the company's onshore Gulf Coast service from 2007 to 2009. His analytical specializations include geologic play description, decline curve analysis, production forecasting and economic modeling. He has widespread experience analyzing unconventional gas assets and has worked on numerous upstream consulting projects, ranging from asset opportunity screenings for exploration and production, to due diligence work for private equity mergers and acquisitions. Clarke also regularly contributes to written media and presents upstream research at key industry conferences. Prior to joining Wood Mackenzie, he worked as a field geologist for HMI, a private engineering and consulting firm in Houston.

Antonio Coutinho is chief energy management officer of Horizon Wind Energy, which he joined in July 2007. He is responsible for operation services (daily operation of wind farms, reliability and original equipment manufacturer management); energy sales (origination and negotiation of power purchase agreements/hedges, market operations, portfolio and risk management); and asset management (performance analysis, contract and business management). Before joining Horizon, Coutinho worked at Energias de Portugal (EDP) as head of energy planning, where he was responsible for the group's portfolio planning in terms of prices, quantities, internal hedges and growth opportunities that result from market, technologies and regulations. Prior to working at EDP, he was a consultant for more than six years at Boston Consulting Group, where he developed his career in the energy sector. Coutinho holds a bachelor's degree in civil engineering and a master's degree in operations research from Instituto Superior Técnico in Lisbon, Portugal.

Amy Myers Jaffe, a Princeton University graduate in Arabic Studies, 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. 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).

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Derek Lemoine is a Ph.D. candidate in energy and resources at the University of California, Berkeley. His dissertation research investigates the interaction of uncertainty with the choice of emission and R&D policies. This involves statistical work quantifying uncertainty regarding the level of climate change as well as economic modeling of policy options over time. He has previously published on the energy and environmental implications of electrified vehicles and on real options methods for valuing plug-in hybrids' battery capacity. He has a bachelor's degree in philosophy and in integrative environmental solutions from the University of the South in Sewanee, Tenn., and a master's degree in energy and resources from UC Berkeley.

Michael E. Parker, P.E., is a technical adviser within ExxonMobil Production Company's Upstream Safety, Health and Environment organization, located in Houston. Parker provides technical support and guidance to ExxonMobil affiliates worldwide on a range of issues, including drilling and production discharges, underground injection control, spill prevention and control, facility decommissioning, artificial reef programs and marine environmental issues. Currently, Parker is lead adviser on issues related to carbon capture and storage. He is a graduate of The University of Texas and Texas A&M University, and is a registered professional engineer in Texas and Louisiana.

Joseph Peters, P.E., is a senior consultant at Black & Veatch management consulting practice and a registered professional engineer in the state of Texas. He provides expertise in the analysis of the technical, market and financial factors that drive and enable the power generation industry. He has plant operational and engineering experience as a nuclear-trained naval officer and, through his experience in power generation technology application engineering with a major original equipment manufacturer, is well versed in the typical technical, regulatory and financial issues that bear on energy asset development, valuation and management. His graduate work complemented this experience and is concerned primarily with energy risk management and energy-related investment decisions. Peters is responsible for fundamental market analysis, independent engineering support and business strategy/planning support. He spent five years in the U.S. Navy operating and maintaining combat systems and nuclear propulsion plants and seven years with GE Energy. Peters graduated from Rice University with a bachelor's degree in chemical engineering and holds an Energy Risk Management Certificate and master's degree in finance from the University of Houston.

Matthew Rogers is the senior adviser to the U.S. secretary of energy for Recovery Act implementation. Previously, he was a senior partner at McKinsey & Company's San Francisco office. During his time with McKinsey, Rogers led its American Petroleum Practice and its North American Electric Power and Natural Gas Practice, and helped establish its Clean Technology Practice. He spent more than 20 years consulting with leading oil companies and utilities globally and played a leading role in developing McKinsey's perspectives on global energy supply/demand and greenhouse gas abatement economics. He served the Obama Presidential Transition Team in a special effort to develop opportunities to reduce the cost of and increase renewables content in federal energy procurement. Rogers graduated magna cum laude from Princeton University. After graduation, he joined Credit Suisse First Boston as an energy investment banking analyst. He earned an M.B.A. from Yale University's School of Management.

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Participant Biographies (continued)

Mark Spolyar is a partner at Baker Botts L.L.P., where he handles a broad range of intellectual property (IP) matters, including intellectual property transactions and licensing, patent analysis, patent strategy, patent prosecution and litigation. Spolyar has counseled Fortune 50 companies, small startup companies and individuals on many aspects of IP protection, licensing, monetization, risk analysis and dispute resolution. He has helped clients develop robust IP protection programs, resulting in strong patent, trademark, copyright and trade secret assets that protect substantial revenue streams, reduce exposure to IP claims and provide other sources of value. Spolyar also currently teaches on intellectual property licensing as an adjunct professor at University of California Hastings College of the Law in San Francisco, Calif. In 2009, he was listed as one of the Daily Journal's "Top 25 Intellectual Property Portfolio Managers." He is a member of the State Bar of California, and is also registered to practice before the U.S. Patent and Trademark Office. Prior to his legal career, he was a biomedical engineer at Alza Corporation in Palo Alto, Calif., tasked with developing initial designs for iontophoretic drug delivery systems. Spolyar received a B.S.E. in biomedical engineering with honors from Duke University and his law degree with honors from the University of California Hastings College of the Law.

Melissa Stark is the clean energy lead for Accenture's energy industry group. She has more than 16 years experience in management consulting, with the majority of that time spent working across all sectors of the energy industry. She focuses on carbon management, biofuels, electrification of transport, investment and decision support, and supply chain in the energy industry. Stark has also authored a number of studies, including "The National Oil Company — Transforming the Competitive Landscape for Global Energy," published in 2006. She authored Accenture's two biofuels studies: "Irrational Exuberance — A Supply Perspective," published in 2007; and "Biofuels' Time of Transition — Achieving High Performance in a World of Increasing Fuel Diversity," published in 2008. Her latest paper, "Betting on Science: Disruptive Technologies in Transport Fuels," was published in November 2009 and compares a number of competing technologies, the companies bringing the technologies to market and the alternative energy activity in 10 countries. The study overview is available on Accenture.com. Stark has a bachelor's degree in finance from the Haas School of Business at the University of California, Berkeley (with honors; recipient of Finance Award) and a master's degree from Northwestern University (with honors; recipient of Transportation Management Top Student Award).

Ted Temzelides, Ph.D., is a professor of economics at Rice University. Before coming to Rice, Temzelides had taught at the University of Minnesota, the Tippie College of Business at The University of Iowa, the University of Pittsburgh and the Wharton School at the University of Pennsylvania. He has consulted for the Federal Reserve as well as the European Central Bank. His research concentrates on macroeconomics, where he currently studies issues related to the role of financial institutions, 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.

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Michael Webber, Ph.D., is the associate director of the Center for International Energy and Environmental Policy in the Jackson School of Geosciences, co-director of the Clean Energy Incubator at the Austin Technology Incubator, fellow of the Strauss Center for International Security and Law at the Lyndon B. Johnson School of Public Affairs, and assistant professor of mechanical engineering at The University of Texas (UT) at Austin. He has authored more than 75 scientific literary works, including a compendium of his commentary titled "Changing the Way America Thinks About Energy." Prior to joining UT Austin, Webber studied issues relevant to energy, innovation, manufacturing and national security at the RAND Corporation. Previously, he was a senior scientist at Pranalytica, inventing sensors for homeland security, industrial and environmental monitoring applications. In 2005, he was recognized by the College of Engineering at UT Austin as an Outstanding Young Engineering Graduate. Webber was selected as a Next Generation Fellow of The American Assembly in 2006, an American Memorial Marshall Fellow of the German Marshall Fund for 2007 and an AT&T Industrial Ecology Fellow in 2009. His expertise, opinions and research have been featured in The Wall Street Journal, The New York Times and many other prominent media outlets. Webber received a B.A. and B.S. with high honors from UT Austin; he earned his M.S. and Ph.D. in mechanical engineering (with a minor in electrical engineering) from Stanford University.

