BEFORE THE COMMITTEE ON ENERGY AND COMMERCE,

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

HEARINGS ON THE AMERICAN CLEAN ENERGY SECURITY ACT (ACESA) OF 2009

APRIL 23, 2009

TESTIMONY OF ROBERT J. MICHAELS, PhD

My name is Robert J. Michaels. I am Professor of Economics at California State University, Fullerton and an independent consultant. I am also Senior Fellow at the Institute for Energy Research and Adjunct Scholar at the Cato Institute. None of today's remarks are the official positions of any of my affiliations or clients.

I hold an A.B. from the University of Chicago and a Ph.D from the University of California, Los Angeles, both in economics. I have performed research, published and spoken on developments in the electricity and gas industries since the 1980s. I have analyzed retail and wholesale competition in a restructured electricity industry, relevant markets and market power in electricity generation, gas pipelines and electric utility mergers, issues in the governance of Regional Transmission Operators, the Federal Energy Regulatory Commission's (FERC) policies on monitoring of regional energy markets, the changing economics of vertically integrated utilities and policy proposals on a national Renewable Portfolio Standard (RPS). I have most recently undertaken research on the economics of a "Smart Grid." My work has appeared in peer-reviewed journals, industry publications including *Public Utilities Fortnightly* and legal publications including *Energy Law Journal*. I have testified before, among others, the FERC, the California Public Utilities Commission, and this Subcommittee's predecessor in 1996. A full biography is attached to this testimony.

I will begin with a discussion of California energy policy, with which I am quite familiar, because California has already begun its own implementations of laws and regulations that resemble those of the American Clean Energy and Security Act. Its experience does not bring optimism about what the bill will produce nationally:

1. California's 2001 RPS law, calls for 20 percent of 2010 power deliveries from renewables. Regulatory uncertainty and opposition to new generation and transmission have left the state with the same percentage of its 2007 power supply coming from renewables as it had in 2001.

2. Per capita power consumption in California has been roughly constant since the mid-1990s, unlike other states where it has risen. Advocates who have credited this achievement to efficiency measures like those in the draft bill have an untenable case. Two major facts explain California's constancy: its buisiness climate has induced massive outmigration of industrial electricity users (whose use is included in the per capita figures), and its restrictive land use policies have substantially increased the number of persons in a typical dwelling unit.

3. Advocates of the bill's and cap-and-trade climate policies frequently cite studies made for the California Air Resources Board (ARB) which purport to show that they will bring the state a net economic stimulus. None was peer reviewed before being made public, and after seeing them all five reviewers were worse than critical. One from the Pew Center on Global Climate Change said that the studies give "the appearance of justifying the chosen package of regulatory measures rather than evaluating it or looking at policy options." Another from Harvard's Kennedy School of Government said that "the economic analysis is terribly deficient in critical ways and should not be used by the state government or the public for the purpose of assessing the likely costs of ARB's plans."

4. California utilities have filed a series of cost-benefit analyses of their "Smart Grid" plans with the state Public Utilities Commission. Southern California Edison's original study of smart meters and electronic operations produced a present value net *negative* cash flow of nearly $500 million. Its filing a year afterward found a small positive cost-benefit figure. The difference came from changed assumptions about demand response and an assumption that the company would be able to remotely control air conditioning and appliances in homes and businesses.

Building on the California experience I move on to this panel's subject, "Allocation Policies to Assist Consumers." It is an odd choice of topic because the draft legislation is virtually silent on both allocation and assistance. The breadth of the bill's subject matter and the financial scope of its programs ensure that it will have massive effects on both households and small businesses. There are important uncertainties about its consequences because critical policy details remain unspecified, most importantly

the allocation of emissions allowances. Nevertheless we can infer some consequences, and they are disturbing. Put simply, this is the most profoundly anti-consumer legislation ever brought before a Congress. Its acknowledged purpose is to raise energy prices to all Americans, and in doing so it will make America less competitive in an ever more competitive world. For reasons they can best explain, administration officials including the Secretary of Energy are on record as favoring higher prices.

As important as the higher prices are the proposed policies that will increase them. Every major provision of the bill is at base a tax, and every one of them is called something else. The renewable electricity standard (RES) for utilities is a tax on conventionally produced electricity. The nation is still within reach of competitive power markets that comply with environmental regulations. But a nationwide RES would replace the competition to reduce power costs with a requirement that more be generated from costly "renewable" sources. The most important of these, wind power, remains uncompetitive after decades of subsidies, and produces only when the wind blows. The tax aspect of the RES is cleverly concealed – none of it will appear on the federal books. Instead this bill will force utilities to purchase renewables, leaving state regulators no choice but to fold their costs into the bills of households and businesses who will have no choice about the resources producing their power.

Another tax turns up in the bill's proposed auction of permits (allowances) to emit carbon, after possibly giving some away to politically favored businesses. The official term is auction, but the real term is tax. The easy way to see this is to look at plans for spending the revenue. Details are not yet firm, but those under discussion include consumer rebates, paydown of the deficit, and financing of health policies. The only possible sources for these funds are debt and taxes, and this is a tax. Like other taxes, allowance charges compel business owners to divert funds that could have otherwise been used to operate their firms and employ people. Those who believe that respending of revenue from allowance auctions will create jobs have been conspicuously silent about jobs that will be destroyed in businesses that must purchase them.

The bill's effects start with scarcer and more expensive energy, but hardly stop there. What happens in energy markets will to varying degrees increase the prices of all other goods and services that use energy in their production. The higher prices mean lower standards of living for the American consumers who purchase them. They also mean that American goods become less attractive to foreign buyers than those from competitor nations that are attempting to develop their energy sectors rather than downgrade them.

This bill's entire thrust is to make energy needlessly scarce, and then somehow conclude that this action is good for the economy. Workers who work with more talented workers are more productive than those who labor alone, workers with more advanced equipment are more productive than those without it, and workers with better and more abundant energy sources are more productive than those without them. Workers forced to work with fewer and more costly energy resources produce less, not more. Scarce energy "creates jobs" by making workers less productive so that it takes more of them to get something done. What this bill really will create is not prosperity, but a less productive, less competitive economy with lower incomes, less opportunity, and less wealth to hand on to future generations.

Thank you for the opportunity to testify. I will be happy to answer any questions.

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AREAS OF QUALIFICATION

Industrial organization; antitrust analysis; regulation, deregulation, and competition in the electricity and gas industries

EMPLOYMENT HISTORY

- Professor of Economics, California State University, Fullerton, 1978-present
- Lecturer, Graduate School of Business Administration, University of Southern California, Irvine Campus, 1993
- Lecturer in Economics, Claremont Graduate School, Claremont, CA, 1992
- Associate Professor of Economics, California State University, Fullerton, 1975-1978
- Research Staff Member, Program Analysis Division, Institute for Defense Analyses, Arlington, VA, 1973-1975

EDUCATION

- University of California, Los Angeles, PhD, Economics, 1972
- University of Chicago, AB, Economics, 1965

PROFESSIONAL AFFILIATIONS AND HONORS

* Named Daniel P. Haan Distinguished Fellow in Economics and Regulation, California State University, Fullerton, 2008-present.

* Member, Registry of Independent Scientific and Technical Advisors, Duke University Law School, 2001 - present
* Co-Editor, *Contemporary Economic Policy*, peer-reviewed journal of the Western Economic Association, 1999 - present
* Adjunct Scholar, Institute for Energy Research, 1995 - present
* Adjunct Scholar, Cato Institute, 1995 - present
* Outstanding Professor, School of Business and Economics, 1989
* Advisor on electricity denationalization to government of New Zealand, 1986-1987
* Coeditor of *Contemporary Policy Issues*, peeer-reviewed journal of the Western Economic Association, 1983-1988
* NSF research award to study financial institutions deregulation, 1979

CONSULTING AND EXPERT TESTIMONY

Testimonies before U. S. House of Representatives Subcommittee on Energy and Power, Federal Energy Regulatory Commission, California Public Utilities Commission, Illinois Commerce Commission, California Energy Commission, and Superior Court of California. [Detailed listing available on request]

Consulting services provided for independent power producers, power marketers, industrial energy consumers, public interest groups, electric utilities, natural gas producers, oil producers, state regulatory commissions, state Attorneys General, and national governments. [Detailed listing available on request.]

SELECTED PUBLICATIONS

"The Case Against a Federal Renewable Power Requirement," *Electric Light & Power* 87 (Jan. 2009), 50-53.

"Renewable Portfolio Standards: Still No Good Reasons," *Electricity Journal* 29 (Oct. 2008), 18-31.

"Electricity Market Monitoring and the Economics of Regulation," *Review of Industrial Organization* 32 (No. 2, 2008), 197-216.

"National Renewable Portfolio Standard: Smart Policy or Misguided Gesture?" *Energy Law Journal* 29 (No. 1, 2008), 79-119.

"A National Renewable Portfolio Standard: Politically Correct, Economically Suspect," *Electricity Journal* 21 (April, 2008), 9-28.

"A Primer on Electricity," "Electricity in Texas," and "Competition in Texas Electric Markets," Three Monographs for Texas Public Policy Foundation, Mar. 2007, at www.texaspolicy.org

Three Monographs for Texas Public Policy Foundation, " A Primer on Electricity" (2006), "Electricity in Texas" (2007), and "The Performance of Competitive Markets in Texas" at http://www.texaspolicy.com/pdf/2007-02-RR04-electricity-rm.pdf.

Co-Author (with J. Jolly Hayden, Director of Transmission, FPL Energy), "Merchant Transmission Redux," *Public Utilities Fortnightly*, Sept. 2006, 58-61.

"Electric Utility Regulation," and "Natural Gas Regulation," topic articles in David Henderson (Ed.), *The Concise Encyclopedia of Economics* (Liberty Fund, 2005)

"Vertical Integration: The Economics that Electricity Forgot," *The Electricity Journal* 17 (Dec. 2004), 11-23.

"California's Electricity Policy: Evolving and Retrogressing," *Natural Gas and Electricity*.V. 21 (Oct. 2004), 10-15.

"Watching the Watchers: Can RTO Market Monitors Really be Independent"?, *Public Utilities Fortnightly*, July 15, 2003, 35-38.

"Energy Markets and Capacity Values: How Complex Should Pricing Be"?, *in* Ahmad Faruqui and Kelly Eakin (Eds.), *Electricity Pricing in Transition, Topics in Regulatory Economics and Policy Vol. 42*, (Kluwer Academic Publishers), 2002.

Co-author (with Nguyen Quan, Digital Safetynet), "Market Power in California: Misunderstanding the Opportunities," *Electricity Journal* 15 (May, 2002), 30-42.

"Venues and Markets: Regulating Competitive Electricity in the West," *Energy Law Journal* , V. 22 (No. 2, 2001), 335-359.

"FERC'S California Market Order: Opportunities Lost and Found," *Public Utilities Fortnightly*, Jan. 1, 2001, 32-34.

Co-Author (With Nguyen Quan, Digital Safetynet), "Games or Opportunities: Bidding in the California Markets," *Electricity Journal*, Jan-Feb. 2001, 91-108.

"Can Non-Profit Transmission be Independent?" *Regulation* V. 16 (No. 3, 2000), 61-66.

"The Governance of Transmission Operators, *Energy Law Journal*, V. 20 (No. 2, 1999), 233-262.

"ISO or Transco? It's Not the Profit, But Who Gets the Reward," *Public Utilities Fortnightly*, August, 1999, 52-54.

Co-author (with Jerry Ellig, George Mason University), "Electricity: Price Spikes by Design,"*Regulation* V. 15 (No. 2, 1999), 20-22.

"Preparing for Gas-Electric Convergence: Mergers or Alliances," in Ahmad Faruqui and J. Robert Malko (Eds.), *Customer Choice: Finding Value in Retail Electricity Markets*, (Public Utilities Reports, Inc.), 1999, 79-94.

Co-Author (with Jerry Ellig, George Mason University). "Price Spike Redux: A Market Emerged, Remarkably Rational," *Public Utilities Fortnightly*, Feb. 1, 1999, 40-47.

Co-Author (with Jerry Ellig, George Mason University), *Electricity Passes the Market Test: Price Spikes in the Summer of 1998*, Mercatus Institute Monograph, George Mason University, Nov. 1998.

"How Gas-Electric Convergence Mergers Affect Competition," *Natural Gas* V. 15 (Sept. 1998), 13-17.

"Securitized Transition Costs: Rethinking Who Wins and Who Loses," *The Electricity Journal* V. 11 (June 1998), 58-65.

"MW Gamble: The Missing Market for Capacity," *The Electricity Journal*, V. 10, Dec. 1997, 56-64.

"Would Anyone Invent Public Power Today? Can Anyone Reinvent It?" *The Electricity Journal*, V. 10, Nov. 1997, 52-58.

"Stranded in Sacramento: California Tries Legislating Competitive Electricity," *Regulation*, V. 20, Spring 1997, pp. 52-56.

Co-author (with Steven Isser, Hagler Bailly): "Stranded Investment: Utility Estimates or Investor Expectations?" *Public Utilities Fortnightly*, June 1, 1997, pp. 26-30.

"Electric Utility Mergers: The Answer or the Question?" *Public Utilities Fortnightly,* Jan. 1, 1996, pp. 20-23.

"Electric Utility Mergers: The Wrong Strategy at the Wrong Time," *The Electricity Journal,* V. 8, Jan. 1996, pp. 28-36.

"Reducing Risk, Shifting Risk, and Concealing Risk: Why Are There Long-Term Gas Contracts?" in Jerry Ellig and Joseph Kalt (eds.), *New Horizons in Natural Gas Deregulation* (Praeger), 1996, pp. 195-208.

"Stranded Investments, Stranded Intellectuals," *Regulation,* V. 19 No. l, 1996, pp. 47-51.

"After Stranding Recovery, What?" *Public Utilities Fortnightly,* June 1, 1996, pp. 14-18.

"Long-Term Capacity Turnbacks: Not a Short-Term Problem," *Natural Gas,* V. 12, June 1996, pp. 7-11.

"Markets of the Future, Utilities of the Past," *The Electricity Journal,* V. 9, Oct. 1996, pp. 58-65.

"Mergers and Market Power: Should Antitrust Rule?" *Public Utilities Fortnightly*, Nov. 15, 1996, pp. 42-44.

"Market Power in Electric Utility Mergers: Access, Energy, and the Guidelines," *Energy Law Journal,* V. 17 No. 2, 1996, pp. 401-424.

"Restructuring California's Electric Industry: Lessons for the Other Forty-Nine States," prepared for Institute for Energy Research, Houston, 1995.

"Stranded Investment: Pay Up or Mark Down? *Public Utilities Fortnightly*, May 15, 1995, pp. 21-25.

"PoolCo: Inventing the Wrong Market," *Public Utilities Fortnightly*, July 1, 1995, pp.43-46.

"Regulation Meets Competition: Antitrust in the New Gas Distribution Industry," *Natural Gas*, Nov. 1995, pp. 15-19.

Co-author (with Arthur S. De Vany, University of California, Irvine): "Market-Based Rates for Interstate Gas Pipelines: The Relevant Market and the Real Market," *Energy Law Journal*, V. 16 No. 2, 1995, pp. 299-346.

Co-author (with Charles G. Stalon): "Decontrol of Wellhead Prices and the First Wave of Gas Industry Restructuring," in Arlon Tussing and Bob Tippee, *The Natural Gas Industry*, 2nd. Ed. (PennWell Books), 1995, pp. 185-220.

"Wholesale Pooling: The Monopolist's New Clothes," *The Electricity Journal*, V. 7, Dec. 1994, pp. 64-76.

"Unused and Useless: The Strange Economics of Stranded Investment," *The Electricity Journal*, V. 7, Oct. 1994, pp. 12-22.

Co-author (with Andrew Kleit, Penn State University): "Antitrust, Rent-Seeking, and Regulation: The Past and Future of Otter Tail," *Antitrust Bulletin*, V. 39, Fall 1994, pp. 689-725.

"Fuel Adjustment Clauses: An Idea Whose Time Has Gone," *The Electricity Journal*, V. 7, Feb. 1994, pp. 78-85.

Co-author (with Thomas Hazlett, University of California, Davis): "The Cost of Rent-Seeking: Evidence from Cellular Telephone License Lotteries," *Southern Economic Journal*, V. 59, Jan. 1993, pp. 425-435.

"The New Age of Natural Gas: How the Regulators Brought Competition," *Regulation*, V. 16, Winter 1993, pp. 68-79.

"Not Quite Free Wheeling: The Energy Policy Act of 1992," *Regulation*, V. 16, Winter 1993, pp. 19-23.

"Electric Utility Regulation" and "Natural Gas Regulation," in *Fortune Encyclopedia of Economics* Time-Warner Books, 1993.

"When Captive Customers Bear the Risk," *Public Utilities Fortnightly*, V. 131, Nov. 15, 1993, pp. 13-16.

"Reason for Pessimism: Politics and Policy Cloud the Future of Electricity Competition," *Public Utilities Fortnightly*, V. 131, Sept 15, 1993, pp. 16-20.

Co-author (with Andrew Gill, California State University, Fullerton): "Does Drug Use Decrease Earnings?" *Industrial and Labor Relations Review*,V. 45, April 1992, pp. 419-434.

"Deregulating Electricity: What Stands in the Way," *Regulation*, V. 15, Winter 1992, pp. 38-47.

"What's Legal And What's Not: The Regulation of Opiates in 1912," *Economic Inquiry*, V. 30, Oct. 1992, pp. 696-713.

"Comment on Lee and Ellert," *Research in Law and Economics*, V. 13 No. 1, 1991, pp. 213-219.

Co-author (with Andrew Gill, California State University, Fullerton): "The Determinants of Illegal Drug Use," *Contemporary Policy Issues*, Vol. 9, July 1991, pp. 93-105.

Co-author (with Rodney Smith, Claremont McKenna College, and Arthur DeVany, University of California, Irvine): "Defining a Right of Access to Interstate Natural Gas Pipelines," *Contemporary Policy Issues*, Vol. 8, April 1990, pp. 142-158.

"Conjectural Variations and the Nature of Equilibrium in Rent-Seeking Models," *Public Choice*, Vol. 60, Jan. 1989, pp. 31-40.

"Reorganizing Electricity Supply in New Zealand: Lessons for the United States," *Contemporary Policy Issues*, Vol. 7, Oct. 1989, pp. 73-90.

"Addiction, Compulsion, and the Technology of Consumption," *Economic Inquiry*, Vol. 26, Jan. 1988, pp. 75-88.

"The Design of Rent-Seeking Competitions," *Public Choice*, Vol. 56 No. 1, 1988, pp. 17-29.

Co-author (with Rodney Smith, Claremont McKenna College, and Arthur DeVany, University of California, Irvine): *An Open Access Rights System for Interstate Natural Gas Pipelines*, prepared for Natural Gas Supply Association, Washington, D.C., 1988.

Regulatory and Market Options for Electricity in New Zealand" prepared for New Zealand Treasury, 1987.

"Reinterpreting the Role of Inflation in Politico-Economic Models," *Public Choice*, Vol. 48 No. 2, 1986, pp. 113-124.

Co-author (with Lionel Kalish, California State University, Fullerton): "The Incentives of Regulators: Evidence from Banking," *Public Choice*, Vol. 36, 1981, pp. 187-192.

"Bureaucrats, Legislators, and the Decline of the State Mental Hospital," *Journal of Economics and Business*, Vol. 32, Spring 1980, pp. 198-205.

"Long Term Political Agreements and the Origins of Bureaucratic Power," in *Public Choice in New Orleans* (Gordon Tullock, Ed.), 1980, pp. 37-48.

"Hedonic Prices and the Structure of the Digital Computer Industry," *Journal of Industrial Economics*, Vol. 27, March 1979, pp. 263-275.

Co-author (with Robert E. Kuenne, Princeton University, *et al*): "A Proposal to Protect the U.S. from Oil Import Interruptions," *Policy Analysis*, Vol. 1, Fall 1975, pp. 572-597.

Explorations in a Two-Sector Vintage Model of Economic Growth, Ph.D Dissertation, University of California, Los Angeles, June 1972.

SELECTED RECENT APPEARANCES

11/17/08 Texas Public Policy Foundation, Annual Policy Review Symposium, Austin. Invited Presentation "Monopolies or Markets: How to Power Economic Growth."

6/21/08 Rutgers University, Center for Research in Regulated Industries, 21st Annual Western Conference, Monterey CA, Invited Presentation "Why So Little Compliance with State Renewable Electricity Requirements?"

9/17/07 Institute for Energy Research, National Press Club, Washington D.C., Invited Presentation "A Renewable Portfolio Standard: Does It Benefit Consumers?"

6/28/07 Rutgers University, Center for Research in Regulated Industries, 20th Annual Western Conference, Monterey CA, Invited Presentation "State Renewable Electricity Standards: Efficiency or Rent-Seeking."

4/5/07 Invited expert panelist, Federal Energy Regulatory Commission, Washington, Rulemaking Docket No. RM07-8-000, Review of Market Monitoring Policies.

3/5/07 American Antitrust Institute, Conference on "Lessons Learned from Electricity Restructuring," Arlington, VA. Read invited paper "Electricity Market Monitoring and the Economics of Regulation."

2/7/07 Texas Public Policy Foundation, Fifth Annual Policy Orientation for the Texas Legislature, Invited Presentation "Electricity Restructuring: What Texas Did Right, and What's Left to Do" Material was also presented before State Senate Utilities Committee.

2/21/06 Louisiana State University Center for Energy Studies, Baton Rouge, LA, Conference on Rebuilding Utility Infrastructure: Challenges and Opportunities. Invited presentation "Utilities and Disasters: The Regulatory Compact Meets the Social Contract."

1/23/06 American Antitrust Institute, Sixth Annual Energy Roundtable Forum, Arlington, VA, Invited panelist on "Competition and the Energy Policy Act of 2005."

6/22/05	Rutgers University 18th Annual Western Conference on Regulation, San Diego, CA, Presentation of paper "Rethinking Vertical Integration in Electricity."
1/11/05	American Antitrust Institute, Arlington, VA, Fifth Annual Energy Roundtable Forum, Invited Panelist on "Open Access Revisited."
10/27/04	Marin County Association of Governments, Larkspur CA. Invited address "Electricity in California: New Crisis, or Business as Usual?"
6/24/04	Rutgers University 17th Annual Western Conference on Transmission Expansion, San Diego. Invited Presentation "The Economics of Participant-Funded Electrical Transmission."
10/8/03	Center for Business Intelligence, Conference on Transmission Expansion, Alexandria, VA, Invited Presentation "Participant Funding: Does Competitive Generation Require Competitive Transmission?"
6/25/03	Rutgers University 16th Annual Western Conference on Regulation, San Diego, Invited Presentation "Monitoring Electricity Markets: What Can We Learn from the Economics of Regulation?"
6/20/02	Rutgers University 15th Annual Western Conference on Regulation, Lake Tahoe, Invited Presentation "Measuring and Mitigating Market Power in Electricity: is Supply Margin Analysis Superior?"
5/14/02	Power Association of Northern California, Spring Meeting, Pleasanton, California. Invited Presentation "Electricity: What California Must Do and What FERC Will Allow."
3/12/02	Western Farm Credit Bank, 2002 Shareholders Annual Meeting, Dana Point, California, Invited Presentation "Enron: What Matters and What Doesn't."
12/1/01	Interviewed as one of several "prominent economists and policy leaders" for "Crawling from the Wreckage: Can California's Energy Market Be Saved?" joint initiative of the John D. and Catherine MacArthur Foundation, Rockefeller Foundation, and others. Report summarized in *Public Utilities Fortnightly*, April 1, 2002.
10/4/01	Energy Community Forum, Arlington, Virginia. Panelist on "Alternative Electricity Scenarios after California and September 11."

7/24/01	George Washington University National Institute for Governmental Innovation, Conference on Managing Electric Power Through Deregulation, Sacramento. Invited speaker "Managing Electricity Demand: the Roles of Government and the Market."
6/29/01	Rutgers University 14th Annual Western Conference on Regulation, San Diego. Invited Presentation "Competitive Power Markets: What Economics Have Regulators Learned?"
6/28/01	National Association of Industrial and Office Properties Energy Forum, Irvine. Invited speaker "California Electricity: What Past, What Future?"
6/7/01	Orange County Business Council, Irvine. Invited presentation "Electricity Price Caps: No Theory, No Practice, No Way."
5/31/01	Mercatus Institute, George Mason University, Institute for Congressional Staff, U.S. Capitol, Washington D.C. Invited lecture "Managing Electricity Demand: Prices or Interventions."
5/8/01	California State University, Fullerton "State of the County" Meeting, Anaheim. Invited panelist "Electricity's Future in California's Infrastructure."
4/27/01	Canadian Association of Petroleum Landmen Annual Prospect Exchange, Calgary. Invited Presentation "Electricity in California and the Future of Canadian Gas."
4/10/01	National Regulatory Research Institute, Columbus, Ohio. Invited presentation "Market Power in California: Misunderstanding the Opportunities."
3/19/01	Independent Power Producers Society of Alberta, Banff. Keynote speaker "California and the Future of Competitive Power in Canada."
3/8/01	Institute for Infrastructure Finance and Institutional Investor, Inc. The Americas Meeting, Coral Gables, Florida, Invited speaker "California's Energy Crisis, Version 3.0: Same Solution, Same Mistake."
2/28/01	Marin County Council of Governments, San Rafael. Invited speaker "Local Options in Electricity."
2/21/01	Orange County Forum, Irvine. Invited panelist "California's Energy Crisis."
1/11/01	Orange County Business Council, Irvine. Invited speaker "Electricity in California: How Did Things Go So Wrong?"

12/1/00 U.S. Department of Energy and National Association of Regulatory Utility Commissioners, North American Summit on Harmonizing Electricity Business Practices, Dallas. Invited panelist on competitive issues.

11/17/00 Energy Bar Association Mid-Year Meeting, Washington D.C. Invited panelist on "Retail Markets: Where Are We and Why?"

11/9/00 International Association of Energy Economists, Houston. Invited presentation "Electricity Restructuring: Will Texas Be the Next California?"

10/27/00 Public Lecture, California State University, Fullerton (also given at other venues), "California's Electrical Disaster: Is the Worst Yet to Come?"

10/12/00 Energy Market Report Conference on Volatile Energy Prices, Portland. Invited presentation "The Impact of Higher Western Fuel Prices on Gas-Fired Power Generation."

7/6/00 Rutgers University 13th Annual Advanced Workshop on Regulation and Competition, Monterey. Invited Presentation "Default Supply in Restructured Electricity Markets."

3/15/00 Energy Expo 2000, Houston. Invited Panelist "The Future of the Energy Industry Driven by Technology and Restructuring."

7/8/99 Western Economic Association 74th Annual Conference, San Diego. Invited Presentation "ISOs vs. Transcos."

7/8/99 Rutgers University 12th Annual Advanced Workshop on Regulation and Competition, San Diego. Invited presentation "Governance: The Unexamined Economics of the ISO."

1/21/99 Canadian Institute of Energy Conference on Integration of Regional Energy Markets, Vancouver. Invited Speaker on "East and West Take the Market Test: Price Spikes in the Midwestern Energy and California Ancillary Services Markets."

12/16/98 Co-Chair, The Energy Institute Conference on Western Wholesale Power Markets, Las Vegas. Invited Opening Address "California's Market: What Works and What Doesn't," and Speaker on "Market Power, Gaming, and Antitrust: What Happened to Ancillary Services?"

11/16/98 McGraw-Hill Conference "Southeast Power Markets: Strategies for Restructuring," Miami. Invited Speaker on "California's Electrical Restructuring in Retrospect: All Things Considered, Would I Rather Be in Philadelphia?"

10/8/98 The Energy Institute Conference on Northeast Wholesale Power Markets, New York. Invited Speaker on "Debating the Transmission Pricing Options: The Case for Exchangeable Physical Rights."

9/25/98 Law Seminars International, Seminar on Restructuring Electricity in California, Sacramento. Invited Speaker on "After the Morning After Restructuring: Vision or Myopia?"

8/19/98 American Legislative Exchange Council Annual Meeting, Chicago. Invited Speaker on "June 1998 in the Midwest: Electricity Markets in Chaos."

7/9/98 Rutgers University 11th Annual Advanced Workshop on Regulation and Competition, Monterey, California. Invited speaker on "Stranded Costs: Theory Meets Practice in California."

6/30/98 Western Economic Association, 73rd Annual Conference, Lake Tahoe. Invited speaker at general session panel on power markets. Invited presentation on "California's Electrical Restructuring: What Economists Did Well - and Poorly." Other panelists include Richard Bilas [President, Calif. Public Utilities Commission], Kenneth Lay [CEO, Enron Corporation], and Gordon Smith [CEO, Pacific Gas & Electric].

6/25/98 Co-Chair, The Energy Institute and National Energy Marketers Association Conference "Buying and Selling Electricity in the Western Wholesale Power Market," Las Vegas. Invited address "California's First 100 Days: What Has Changed, What Hasn't, and What Will," and panelist "Antitrust and Market Power as Monitored by the PX and ISO."

4/27/98 Alberta Energy and Utilities Board and National Energy Board of Canada [CAMPUT] Annual Conference, Banff.. Invited speaker on "Visions of Regulatory Renewal: A Reality Check from California."

2/19/98 The Energy Institute and PriceWaterhouseCoopers Conference "New Tax Policies and Your Bottom Line," Washington D.C. Invited presentation on "Rate-Reduction Securitization Bonds."

2/18/98 Co-Chairman, The Energy Institute and Hagler Bailly Conference on Antitrust in the New Electric Industry. Also presented opening address "Where Will Competition

Happen? Relevant Markets and the New Industry" (broadcast on C-SPAN) and prepared remarks for panel "Forming an Antitrust Strategy: Plaintiffs and Defendants."

1/29/98 Invited Testimony on Competitive Issues in Electricity Restructuring, National Association of Attorneys General Hearings on Utility Deregulation, San Francisco.

1/21/98 Canadian Institute of Energy Annual Conference, Vancouver B.C. Invited presentation on "The Reality and Unreality of Gas-Electric Convergence."

MISCELLANY

* Author of bi-weekly column Power Moves," appearing in *New Power Executive* and *The Desk.* (Scudder Publishing Group)
* Numerous appearances as electricity and gas expert in broadcast and print media , includes Wall Street Journal, New York Times, NBC and Fox network news, O'Reilly, Kudlow and Cramer, and others.