

PAUL R. CARPENTER

Principal

Dr. Carpenter holds a Ph.D. in applied economics and an M.S. in management from the Massachusetts Institute of Technology, and a B.A. in economics from Stanford University. He specializes in the economics of the natural gas, oil and electric utility industries. Dr. Carpenter was a co-founder of Incentives Research, Inc. in 1983. Prior to that he was employed by the NASA/Caltech Jet Propulsion Laboratory and Putnam, Hayes & Bartlett, and he was a post-doctoral fellow at the MIT Center for Energy Policy Research. He is currently a Principal and Vice Chairman of *The Brattle Group*.

AREAS OF EXPERTISE

Dr. Carpenter's areas of expertise include the fields of energy economics, regulation, corporate planning, pricing policy, and antitrust. His recent engagements have involved:

- *Natural Gas and Electric Utility Industries:* consulting and testimony on nearly all of the economic and regulatory issues surrounding the transition of the natural gas and electric power industries from strict regulation to greater competition. These issues have included stranded investments and contracts, design and pricing of unbundled and ancillary services, evaluation of supply, demand and price forecasting models, the competitive effects of pipeline expansions and performance-based ratemaking. He has consulted on the regulatory and competitive structures of the gas and electric power industries in the U.S., Canada, the United Kingdom, continental Europe, Australia and New Zealand.
- *Antitrust:* expert testimony in several of the seminal cases involving the alleged denial of access to regulated facilities; analysis of relevant market and market power issues, business justification defenses, and damages.
- *Regulation:* studies and consultation on alternative ratemaking methodologies for oil and gas pipelines, on "bypass" of regulated facilities before the U.S. Congress; advice and testimony before several state utility commissions and the National Energy Board of Canada on new facility certification policy.
- *Finance:* research on business and financial risks in the regulated industries and testimony on risk, cost of capital, and asset valuation for network industries, airports and seaports in the U.S., Canada, Australia and New Zealand.

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PROFESSIONAL AFFILIATIONS

International Association of Energy Economists
American Bar Association (Antitrust Section)
American Economic Association

ACADEMIC HONORS AND FELLOWSHIPS

Stewart Fellowship, 1983
MIT Fellowships, 1981, 1982, 1983
Brooks Master's Thesis Prize (Runner-up), MIT, 1978

PUBLICATIONS

"The Advent of U.S. Gas Demand Destruction and Its Likely Consequences for the Pricing of Future European Gas Supplies," (with Carlos Lapuerta and Morten Frisch), 16 March 2005.

"REx Incentives: Performance Based Ratemaking (PBR) Choices that Reflect Firms' Performance Expectations," (with Johannes P. Pfeifenberger and Paul C. Liu), *The Electricity Journal*, November 2001.

"Asset Valuation and the Pricing of Monopoly Infrastructure Services: A Discussion Paper," (with Carlos Lapuerta) 28 July 2000.

"Competition in Gas Pipeline Markets: International Precedent for Regulatory Coverage Decisions," Report to the National Competition Council of Australia (with Judy Chang), June 2000.

"Methodologies for Establishing National and Cross-Border Systems of Pricing of Access to the Gas System in Europe," Report to the European Commission (with Carlos Lapuerta and Boaz Moselle), February 2000.

"A Critique of Light-handed Regulation: The Case of British Gas," (with Carlos Lapuerta), *Northwestern Journal of International Law & Business*, Volume 19, No. 3, Spring 1999.

"Separate Marketing of Natural Gas by Joint Venture Producers in Australia," (with Jurgen Weiss), prepared for Optima Energy, Australia, submitted to the Upstream Issues Working Group, Australian and New Zealand Minerals and Energy Council, 26 September 1998.

"Likely Trends in Canadian Natural Gas Imports," (with Matthew P. O'Loughlin and Gao-Wen Shao), *Natural Gas*, Volume 14, No. 8, March 1998.

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“Pipeline Pricing to Encourage Efficient Capacity Additions,” (with Frank C. Graves and Matthew P. O’Loughlin), prepared for Columbia Gas Transmission Corporation and Columbia Gulf Transmission Company, February 1998.

“The Outlook for Imported Natural Gas,” (with Matthew P. O’Loughlin and Gao-Wen Shao), prepared for The INGAA Foundation, Inc., July 1997.

“Basic and Enhanced Services for Recourse and Negotiated Rates in the Natural Gas Pipeline Industry,” (with Frank C. Graves, Carlos Lapuerta, and Matthew P. O’Loughlin) May 29, 1996, prepared for Columbia Gas Transmission Corporation, Columbia Gulf Transmission Company.

“Estimating the Social Costs of PUHCA Regulation,” (with Frank C. Graves) submitted on behalf of Central and South West Corp. to the U.S. Securities and Exchange Commission in its Request for Comments on the Modernization of Regulation of Public Utility Holding Companies, File No. S7-32-94, February 6, 1995.

“Review of the Model Developer’s Report, Natural Gas Transmission And Distribution Model (NGTDM) Of The National Energy Modeling System,” December 1994, prepared for U.S. Department of Energy, Energy Information Administration and Oak Ridge National Laboratory under Subcontract No. 80X-SL220V.

“Pricing of Electricity Network Services to Preserve Network Security and Quality of Frequency Under Transmission Access,” (with Frank C. Graves, Marija Ilic, and Asef Zebian) response to the Federal Energy Regulatory Commission’s Request for Comments in its Notice of Technical Conference Docket No. RM93-19-000, November 1993.

“Creating a Secondary Market in Natural Gas Pipeline Capacity Rights Under FERC Order No. 636,” (with Frank C. Graves) draft December 1992, Incentives Research, Inc.

“Review of the Component Design Report, Natural Gas Annual Flow Module, National Energy Modeling System,” August 1992, prepared for the U.S. Department of Energy, Energy Information Administration.

“Unbundling, Pricing, and Comparability of Service on Natural Gas Pipeline Networks,” (with Frank C. Graves) November 1991, prepared for the Interstate Natural Gas Association of America.

“Review of the Gas Analysis Modeling System (GAMS): Final Report of Findings and Recommendations,” August 1991, prepared for the U.S. Dept. of Energy, Energy Information Administration.

“Estimating the Cost of Switching Rights on Natural Gas Pipelines,” (with F.C. Graves and J.A. Read) *The Energy Journal*, October 1989.

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“Demand-Charge GICs Differ from Deficiency-Charge GICs,” (with F.C. Graves) *Natural Gas*, Vol. 6, No. 1, August 1989.

“What Price Unbundling?” (with F.C. Graves) *Natural Gas*, Vol. 5 No. 10, May 1989.

Book Review of *Drawing the Line on Natural Gas Regulation: The Harvard Study on the Future of Natural Gas*, Joseph Kalt and Frank Schuller, eds., in *The Energy Journal*, April 1988.

“Adapting to Change in Natural Gas Markets,” (with Henry D. Jacoby and Arthur W. Wright) in *Energy, Markets and Regulation: What Have We Learned?*, Cambridge: MIT Press, 1987.

Evaluation of the Commercial Potential in Earth and Ocean Observation Missions from the Space Station Polar Platform, Prepared by Incentives Research for the NASA Jet Propulsion Laboratory under Contract No. 957324, May 1986.

An Economic Comparison of Alternative Methods of Regulating Oil Pipelines, (with Gerald A. Taylor) Prepared by Incentives Research for the U.S. Department of Energy, Office of Competition, July 1985.

“The Natural Gas Policy Drama: A Tragedy in Three Acts,” (with Arthur W. Wright) MIT Center for Energy Policy Research Working Paper No. 84-012WP, October 1984.

Oil Pipeline Rates and Profitability under Williams Opinion 154, (with Gerald A. Taylor), Prepared by Incentives Research for the U.S. Department of Energy, Office of Competition, September 1984.

Natural Gas Pipelines After Field Price Decontrol: A Study of Risk, Return and Regulation, Ph.D. Dissertation, Massachusetts Institute of Technology, March 1984. Published as a Report to the U.S. Department of Energy, Office of Oil and Gas Policy, MIT Center for Energy Policy Research Technical Report No. 84-004.

The Competitive Origins and Economic Benefits of Kern River Gas Transmission, Prepared by Incentives Research, Inc., for Kern River Gas Transmission Company, February 1994.

“Field Price Decontrol of Natural Gas, Pipeline Risk and Regulatory Policy,” in *Government and Energy Policy*, Richard L. Itteilag, ed., Washington D.C., June 1983.

“Risk Allocation and Institutional Arrangements in Natural Gas,” (with Arthur W. Wright) invited paper presented to the American Economic Association Meetings, San Francisco, December 1983.

“Vertical Market Arrangements, Risk-shifting and Natural Gas Pipeline Regulation,” Sloan School of Management Working Paper No. 1369-82, September 1982 (Revised April 1983).

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Natural Gas Pipeline Regulation After Field Price Decontrol (with Dr. Henry Jacoby and Arthur W. Wright), prepared for U.S. Department of Energy, Office of Oil and Gas Policy, MIT Energy Lab Report No. 83-013, March 1983.

Book Review of *An Economic Analysis of World Energy Problems*, by Richard L. Gordon, *Sloan Management Review*, Spring 1982.

“Perspectives on the Government Role in New Technology Development and Diffusion,” (with Drew Bottaro) MIT Energy Lab Report No. 81-041, November 1981.

International Plan for Photovoltaic Power Systems (co-author), Solar Energy Research Institute with the Jet Propulsion Laboratory Prepared for the U.S. Department of Energy, August 1979.

Federal Policies for the Widespread Use of Photovoltaic Power Systems (contributor), Jet Propulsion Laboratory Report to the U.S. Congress DOE/CS-0114, March 24, 1980.

“An Economic Analysis of Residential, Grid-connected Solar Photovoltaic Power Systems,” (with Gerald A. Taylor) MIT Energy Laboratory Technical Report No. 78-007, May 1978.

SPEECHES/PRESENTATIONS

“LNG Access Policy and California,” California Resources Agency Workshop on LNG, June 1, 2005.

Opening Remarks at the Eighth Central and Eastern European Power Industry Forum (CEEPIF 2001), Budapest, March 29, 2001.

“CPUC v. El Paso Merchant Energy, et al., FERC Docket No. RP00-241-000,” ABA Forum, Washington, DC, September 6, 2001.

“Overseas Experience – Lessons for Australian Gas and Power Markets from California and Europe,” 2001 Gas Industry Forum, The Australian Gas Association, Melbourne, Victoria, Australia, June 26, 2001.

“Liberalizing Energy Markets: Lessons from California’s Crisis,” 20th Annual Conference on US-Turkish Relations, Washington, DC, March 27, 2001.

“Opening Remarks from the Chair: Rates, Regulations and Operational Realities in the Capacity Market of the Future,” AIC conference on “Gas Pipeline Capacity ‘97,” Houston, June 17, 1997.

“Lessons from North America for the British Gas TransCo Pricing Regime,” prepared for AIC conference on: Gas Transportation and Transmission Pricing, London, England, October 17, 1996.

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“GICs and the Pricing of Gas Supply Reliability,” California Energy Commission Conference on Emerging Competition in California Gas Markets, San Diego, November 9, 1990.

“The New Effects of Regulation and Natural Gas Field Markets: Spot Markets, Contracting and Reliability,” American Economic Association Annual Meeting, New York City, December 29, 1988.

“Appropriate Regulation in the Local Marketplace,” Interregional Natural Gas Symposium, Center for Public Policy, University of Houston, November 30, 1988.

“Market Forces, Antitrust, and the Future of Regulation of the Gas Industry,” Symposium on the Future of Natural Gas Regulation, American Bar Association, Washington D.C., April 21, 1988.

“Valuation of Standby Tariffs for Natural Gas Pipelines,” Workshop on New Methods for Project and Contract Evaluation, MIT Center for Energy Policy Research, Cambridge, March 3, 1988.

“Long-term Structure of the Natural Gas Industry,” National Association of Regulatory Utility Commissioners Meeting, Washington D.C., March 1, 1988.

“How the U.S. Gas Market Works” or Doesn’t Work,” Ontario Ministry of Energy Symposium on *Understanding the United States Natural Gas Market*, Toronto, March 18, 1986.

“The New U.S. Natural Gas Policy: Implications for the Pipeline Industry,” Conference on Mergers and Acquisitions in the Gas Pipeline Industry, Executive Enterprises, Houston, February 26-27, 1986.

Various lectures and seminars on U.S. natural gas industry and regulation for graduate energy economics courses at Massachusetts Institute of Technology, 1984-96.

Panelist in University of Colorado Law School workshop on state regulations of natural gas production, June 1985. (Transcript published in *University of Colorado Law Review*.) “Oil Pipeline Rates after the *Williams* 154 Decision,” Executive Enterprises, Conference on Oil Pipeline Ratemaking, Houston, June 19-20, 1984.

“Issues in the Regulation of Natural Gas Pipelines,” California Public Utilities Commission Hearings on Natural Gas, San Francisco, May 21, 1984.

“The Natural Gas Pipelines in Transition: Evidence From Capital Markets,” Pittsburgh Conference on Modeling and Simulation, Pittsburgh, April 20, 1984.

“Financial Aspects of Gas Pipeline Regulation,” Pittsburgh Conference on Modeling and Simulation, Pittsburgh, April 19-20, 1984.

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“Natural Gas Pipelines After Field Price Decontrol,” Presentations before Conferences of the International Association of Energy Economists, Washington D.C., June 1983, and Denver, November 1982.

“Spot Markets for Natural Gas,” MIT Center for Energy Policy Research Semi-annual Associates Conference, March 1983.

“Pricing Solar Energy Using a System of Planning and Assessment Models,” Presentations to the XXIV International Conference, The Institute of Management Science, Honolulu, June 20, 1979.

TESTIMONIAL EXPERIENCE

Antitrust/Federal Court/Arbitration:

In the Superior Court of the State of California, County of San Diego, *Natural Gas Anti-trust Cases I, II, III, & IV*, February 2006 (declaration).

In the United States District Court for the State of California, County of Los Angeles, Central District, *TXU Energy Services Company v. American Remedial Technologies*, March 2003, April 2003.

In the United States District Court for the Northern District of Alabama, Northeastern Division, *The City of Huntsville d/b/a Huntsville Utilities v. Proliance Energy, LLC*, February 2003, June 2003, February 2005.

In the Arbitration between Wellington International Airport Ltd., and Air New Zealand and Qantas Airways Ltd., August 2002.

In the United States District Court for the Eastern District of Virginia, Alexandria Division, *Hess Energy Inc. v. Lightning Oil Company, Ltd.*, July 2002.

In the United States District Court for the District of Colorado, *The Farm Credit Bank of Wichita*, formerly known as *The Federal Land Bank of Wichita, et al., v. Atlantic Richfield Company*, April 2001.

In the United States Bankruptcy Court for the District of Delaware, *KCS Energy, Inc., et al., Debtors: Chapter 11*, November 2000.

Mediation between *Methanex LTD, et al* and *Westgate Port*, New Zealand, May 2000.

In the matter of the Arbitration between *American Central Gas Company v. Union Pacific Resources and Duke Energy Fuels, et al.*, July 2000.

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In the United States District Court for the Western District of Missouri, *Riverside Pipeline Company, L.P., et al., v. Panhandle Eastern Pipeline Company*, September 1998.

In the United States District Court, District of Columbia, *United States of America, Dept. of Justice v. Enova Corporation*, August 1998.

In the matter of the Arbitration between *Western Power Corp. and Woodside Petroleum Corp., et al.*, Perth, Western Australia, May-July 1998.

In the United States District Court for the District of Montana, Butte Division, *Paladin Associates, Inc. v. Montana Power Company*, November- December 1997.

In the United States District Court for the District of Colorado, *Atlantic Richfield Co. v. Darwin H. Smallwood, Sr., et al.*, July 1997.

In the Australian Competition Tribunal, *Review of the Trade Practices Act Authorisations for the AGL Cooper Basin Natural Gas Supply Arrangements*, on behalf of the Australian Competition and Consumer Commission, February 1997.

In the Southwest Queensland Gas Price Review Arbitration, Adelaide, South Australia, May 1996.

In the matter of the Arbitration between *Amerada Hess Corp. v. Pacific Gas & Electric Co.*, May 1995.

In re Columbia Gas Transmission Corp., Claims Quantification Proceeding in the U.S. Bankruptcy Court for the District of Delaware, Before the Claims Mediator, July and November 1993.

Deposition Testimony in *Fina Oil & Gas v. Northwest Pipeline Corp. and Williams Gas Supply* (New Mexico) 1992.

Testimony by Affidavit in *James River Corp. v. Northwest Pipeline Corp.* (Fed. Ct. for Oregon) 1989.

Deposition and Testimony by Affidavit in *Merrion Oil and Gas Col, et al., v. Northwest Pipeline Corp.* (Fed. Ct. for New Mexico) 1989.

Deposition Testimony in *Martin Exploration Management Co., et al. v. Panhandle Eastern Pipeline Co.* (Fed. Ct. for Colorado) 1988 and 1992.

Trial Testimony in *City of Chanute, et al. v. Williams Natural Gas* (Fed. Ct. for Kansas) 1988.

Deposition Testimony in *Sinclair Oil Co. v. Northwest Pipeline Co.* (Fed. Ct. for Wyoming) 1987.

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Deposition and Trial Testimony in *State of Illinois v. Panhandle Eastern Pipeline Co.* (Fed. Ct. for C.D. Ill) 1984-87.

Economic/Regulatory Testimony:

Before the Regulatory Commission of Alaska, In the Matter of the *Gas Sales Agreement Between ENSTAR Natural Gas Company, A Division of SEMCO Energy Inc. And Marathon Oil Company* filed as TA139-4, Docket No. U-06-2, March 2006.

Before the New Jersey Board of Public Utilities, in the matter of the *Joint Petition of Public Service Electric and Gas Company and Exelon Corporation For Approval of a Change in Control of Public Service Electric and Gas Company, and Related Authorizations*, Docket No. EM05020106, November 2005, December 2005, January 2006.

Before the Pennsylvania Public Utility Commission, *Application for Approval of the Merger of Public Service Enterprise Group and Exelon Corporation*, Docket No. A-110550F0160, June 2005, August 2005, September 2005.

Before the National Energy Board of Canada, in the matter of *TransCanada Pipelines LTD.*, RH-2-2004 Phase II, Cost of Capital, January 2005.

Before the California Public Utilities Commission, *Order Instituting Investigation into the Gas Market Activities of Southern California Gas Company, San Diego Gas and Electric, Southwest Gas, Pacific Gas and Electric, and Southern California Edison and their Impact on the Gas Price Spike Experience at the California Border from March 2000 through May 2001* on behalf of Southern California Edison, Docket No. I. 02-11-040, December 2003, May 2004, June 2004.

Before the Alberta Energy and Utilities Board in the matter of *Alberta Energy and Utilities Board Generic Cost of Capital Hearing on behalf of Nova Gas Transmission LTD*, Proceeding No. 1271597, November 2003.

Before the Federal Energy Regulatory Commission (FERC), *California Public Utilities Commission v. El Paso Natural Gas Company, El Paso Merchant Energy-Gas, L.P., and El Paso Merchant Energy Company* on behalf of Southern California Edison, Docket No. RP00-241-000, May 2001, February 2002.

Before the National Energy Board of Canada, in the matter of *TransCanada Pipelines, Ltd. Fair Return Application*, March 2002.

Before the California Public Utilities Commission, *Application of Wild Goose Storage Inc. to Amend its Certificate of Public Convenience and Necessity to Expand and Construct Facilities For Gas Storage Operation*, Docket No. A. 01-06-029, November 2001.

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Before the California Public Utilities Commission, *Application of Southern California Gas Company Regarding Year Six (1999-2000) Under Its Experimental Gas Cost Incentive Mechanism and Related Gas Supply Matters*, Application No. 00-06-023, (On behalf of Southern California Edison Company), November 2001.

Before the U.S. Congress, House of Representatives, Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs, Hearings on *California Natural Gas Market*, October 2001.

Before the New Zealand Commerce Commission, *Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports*, July 2000, August 2001.

Before the National Energy Board of Canada in the matter of the *National Energy Board Act* and the Regulations made thereunder; and in the matter of an *Application by TransCanada PipeLines Limited* for orders pursuant to Part I and Part IV of the *National Energy Board Act*, June 2001.

Before the California Assembly, Subcommittee on Energy Oversight, *Hearings into the Causes of the Natural Gas Price Increases During the California Energy Crisis*, April 2001.

Before the California Public Utilities Commission, *CPN Pipeline Co. & CPN Gas Marketing Co. v. Pacific Gas & Electric*, Case No. C00-09-021, October 2000.

Before the California Public Utilities Commission in the matter of *Southern California Gas Co. for Authority to Implement a Rate for Peaking Service*, Application No. 00-06-032, (On behalf of Kern River Gas Transmission and Questar Southern Trails Pipeline Co.), September 2000.

Before the Federal Energy Regulatory Commission (FERC), *California Public Utilities Commission v. El Paso Natural Gas Company, El Paso Merchant Energy-Gas, L.P., and El Paso Merchant Energy Company*, Docket No. RP00-241-000, August 2000.

Kern River Gas Transmission, Federal Energy Regulatory Commission (FERC) Docket No. RP99-274-003, August 2000.

Before the California Public Utilities Commission, Rulemaking on the Commission's Own Motion to Assess and Revise the Regulatory Structure Governing California's Natural Gas Industry, *California Natural Gas Market Conditions Report*, Docket No. R.98-01-011, on behalf of Southern California Edison, July 1998.

Before the National Energy Board of Canada, *Application of Alliance Pipeline Ltd.*, Hearing Order GH-3-97, December 1997, April 1998.

Before the California Public Utilities Commission, *Pacific Enterprises, Enova Corporation, et al. Merger Proceedings*, Docket A.96-10-038, on behalf of Southern California Edison, August 1997.

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In the Superior Court of the State of California for the County of Los Angeles, *Pacific Pipeline System Inc. v. City of Los Angeles*, on behalf of Pacific Pipeline System Inc., January 1997.

Before the U.K. Monopolies and Mergers Commission, *British Gas Transportation and Storage Price Control Review*, on behalf of Enron Capital and Trade Resources Limited, January 1997.

Northern Border Pipeline Company, Federal Energy Regulatory Commission (FERC) Docket No. RP96-45-000, July 1996.

Wisconsin Electric Power Co., Northern States Power Co. Merger Proceedings. FERC Docket No. EC 95-16-000, on behalf of Madison Gas & Electric Co., Wisconsin Citizens Utility Board and the Wisconsin Electric Cooperative Association, May 1996.

Before the California Public Utilities Commission, Application of PG&E for Amortization of Interstate Transition Cost Surcharge, Application 94-06-044, on behalf of El Paso Natural Gas, December 1995.

Tennessee Gas Pipeline Company, FERC Docket No. RP95-112-000, on behalf of JMC Power Projects, September 1995.

Before the National Energy Board of Canada, Drawdown of Balance of Deferred Income Taxes Proceeding, RH-1-95, on behalf of Foothills Pipe Lines Ltd., September 1995.

Pacific Gas Transmission, FERC Docket No. RP94-149-000, on behalf of El Paso Natural Gas, May 1995.

Before the California Public Utilities Commission, Application of Pacific Pipeline System, Inc., A.91-10-013, on behalf of PPSI, April 1995.

Before the National Energy Board of Canada, *Multipipeline Cost of Capital Proceeding*, RH-2-94, on behalf of Foothills Pipe Lines Ltd., November 1994.

Before the California Public Utilities Commission, Pacific Gas & Electric 1992 Operations Reasonableness Review, Application 93-04-011, on behalf of El Paso Natural Gas, November 1994.

Before the National Energy Board of Canada, *Foothills Pipe Lines (Alta.) Ltd.*, Wild Horse Pipeline Project, Order No. GH-4-94, October 1994.

Iroquois Gas Transmission System, L.P., FERC Docket No. RP94-72-000, on behalf of Masspower and Selkirk Cogen Partners, September 1994.

Tennessee Gas Pipeline Co., FERC Docket No. RP91-203-000, on behalf of JMC Power Projects and New England Power Company, February, May 1994.

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Before the California Public Utilities Commission, on the Application of Pacific Gas & Electric Company to Establish Interim Rates for the PG&E Expansion Project, July 1993.

Before the Florida Public Service Commission, Petition of Florida Power Corporation for Order Authorizing A Return on Equity for Florida Power's Investment in the SunShine Intrastate and the SunShine Interstate Pipelines, FPSC Docket No. 930281-EI, June 4, 1993.

Before the Florida Public Service Commission, Application for Determination of Need for an Intrastate Natural Gas Pipeline by SunShine Pipeline Partners, FPSC Docket No. 920807-GP, April-May 1993.

Northwest Pipeline Corp., et. al., FERC Docket No. IN90-1-001, February 1993.

City of Long Beach, Calif., vs. Unocal California Pipeline Co., before the California Public Utilities Commission, Case No. 91-12-028, February 1993.

Alberta Energy Resources Conservation Board, on Applications of NOVA Corporation of Canada to Construct Facilities, January 1993.

Before the California Public Utilities Commission, on the Application of Pacific Gas & Electric Co. to guarantee certain financing arrangements of Pacific Gas Transmission Co. not to exceed \$751 million, 1992.

Mississippi River Transmission Co., FERC Docket No. RP93-4-000, October 1992, September 1993.

Unocal California Pipeline Co., FERC Docket No. IS92-18-000, August 1992.

Before the California Public Utilities Commission, in the Rulemaking into natural gas procurement and system reliability issues, R.88-08-018, June 1992.

Alberta Energy Resources Conservation Board, *Altamont & PGT Pipeline Projects*, Proceeding 911586, March 1992.

Before the California Utilities Commission, on the Application of Southern California Gas Company for approval of capital investment in facilities to permit interconnection with the Kern River/Mojave pipeline, A.90-11-035, May 1992.

Northern Natural Gas, FERC Docket No. RP92-1-000, October 1991.

Florida Gas Transmission, FERC Docket No. RP91-1-187-000 and CP91-2448-000, July 1991.

Tarpon Transmission, FERC Docket No. RP84-82-004, January 1991.

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Before the California Public Utilities Commission, on the Application of Pacific Gas & Electric Co. to Expand its Natural Gas Pipeline System, A.89-04-033, May 1990 and October 1991.

CNG Transmission, FERC Docket No. RP88-211, March 1990.

Panhandle Eastern Pipeline, FERC Docket No. RP88-262, March 1990.

Mississippi River Transmission, FERC Docket No. RP89-249, October 1989, September 1990.

Tennessee Gas Pipeline, FERC Docket No. CP89-470, June 1989.

Empire State Pipeline, Case No. 88-T-132 before the New York Public Service Commission, May 1989.

Before the U.S. Congress, House of Representatives, Committee on Energy and Commerce, Subcommittee on Energy and Power, Hearings on “Bypass” Legislation, May 1988.

Tennessee Gas Pipeline, FERC Docket No. RP86-119, 1986-87.

Mojave Pipeline Co., FERC Docket No. CP85-437, 1987-88.

Consolidated Gas Transmission Corp., FERC Docket No. RP88-10, 1988.

Panhandle Eastern, FERC Docket No. RP85-194, 1985.

On behalf of the Natural Gas Supply Association in FERC Rulemaking Docket No. RM85-1, 1985-86.

On behalf of the Panhandle Eastern Pipeline Co. in FERC Rulemaking Docket No. RM85-1, 1985.