

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Pennsylvania Public Utility Commission
Bureau of Investigation and Enforcement

v.

HIKO Energy LLC

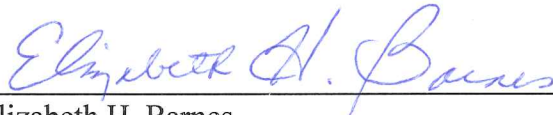
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C-2014-2431410

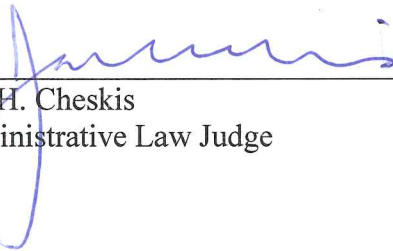
ORDER

And Now, upon due consideration of HIKO Energy LLC's (HIKO) Proposed Transcript Corrections filed on May 26, 2015, there being no objection, in accordance with 52 Pa. Code § 5.253(f), IT IS ORDERED that said proposed transcript corrections are hereby granted. The transcript of the hearing held on April 20, 2015, at Docket No. C-2014-2431410 is corrected to reflect the corrections in Attachment A and the official transcript shall reflect the admission of Exhibits 1 and 2 to the Rebuttal Testimony of Charles J. Chicchetti, attached to this Order as Attachments B and C, respectively.

Date: June 3, 2015



Elizabeth H. Barnes
Administrative Law Judge



Joel H. Cheskis
Administrative Law Judge

ATTACHMENT A

PROPOSED TRANSCRIPT CORRECTIONS

Speaker	Page:Line No.	Transcript	Correction
N/A	23:5	Kline	Klein
N/A	23:7	Kline	Klein
N/A	23:9	Kline	Klein
N/A	25:25	Kline	Klein
N/A	26:7	Kline	Klein
N/A	26:8	Cicchetti HIKO Exhibits 3,4,5,6,	Cicchetti HIKO Exhibits 1, 2, 3,4,5,6,
Mr. Gentile	29:9	Kline	Klein
Mr. Gentile	30:25	Kline	Klein
Mr. Gentile	32:9	Kline	Klein
Mr. Gentile	35:2	Mr. Swindler: I didn't want to wait too long . . .	Mr. Gentile: I didn't want to wait too long . . .
Mr. Gentile	46:23	As I read the penalty factors in 12.01	As I read the penalty factors in 1201
Mr. Gentile	51:5	. . . before the polar vortex, because we were just looking months, January through April, correct?	. . . before the polar vortex, because we were just looking at months, January through April, correct?
Mr. Gentile	51:12	. . . about what refunds had already provided to	. . . about what refunds had already been

Speaker	Page:Line No.	Transcript	Correction
		those customers?	provided to those customers?
Mr. Mumford	51:23-24	There was no precedent that could find or think of.	There was no precedent that I could find or think of.
Mr. Gentile	52:21-22	Well, how many times have you ever testify in support of a penalty?	Well, how many times have you testified in support of a penalty?
Mr. Gentile	54:8	And so the question I have is, isn't relevant to . . .	And so the question I have is, isn't it relevant to . . .
Mr. Gentile	73:17	Kline	Klein
Mr. Gentile	76:7	But you didn't take that into at all in setting . . .	But you didn't take that into account at all in setting . . .
Mr. Gentile	78:10	Kline	Klein
Mr. Gentile	78:23	Kline	Klein
Mr. Gentile	82:7	Kline	Klein
Mr. Mumford	83:22-23	Well, yeah, I had a general idea based no the fact that there were over . . .	Well, yeah, I had a general idea based on the fact that there were over . . .
Mr. Gentile	111:6-7	And do you know that the civil penalty in that case is going to be?	And do you know what the civil penalty in that case is going to be?
Mr. Swindler	140:12	Kline	Klein
Mr. Swindler	140:14	Kline	Klein

Speaker	Page:Line No.	Transcript	Correction
Judge Barnes	140:17	Kline	Klein
Mr. Gentile	140:19	Kline	Klein
Judge Barnes	141:6	Kline	Klein
N/A	141:9	Kline	Klein
Mr. Swindler	141:13	Kline	Klein
Mr. Swindler	141:17	Kline	Klein
Mr. Klein	141:19	Kline	Klein
Mr. Swindler	141:24	Kline	Klein
Mr. Swindler	142:17	Kline	Klein
Mr. Swindler	143:1	Kline	Klein
Mr. Swindler	143:10	Kline	Klein
Mr. Swindler	143:17	Kline	Klein
Mr. Swindler	146:19	Kline	Klein
Mr. Klein	150:24	State date or service date	Start date or service date
Mr. Gentile	154:4	Kline	Klein
Mr. Swindler	154:10	Kline	Klein

Speaker	Page:Line No.	Transcript	Correction
Mr. Swindler	155:5	Kline	Klein
Judge Barnes	155:10	Kline	Klein
Judge Barnes	155:11	Chevy Simmons	Shevy Simins
Mr. Gentile	155:20	Kline	Klein
N/A	155:24	Kline	Klein
Mr. Shulman	156:3	Kline	Klein
Mr. Shulman	156:10	Kline	Klein
N/A	156:13	Kline	Klein
Mr. Shulman	156:23	Kline	Klein
Mr. Shulman	157:5	Kline	Klein
Mr. Shulman	157:7	Kline	Klein
Mr. Shulman	160:2	Kline	Klein
Judge Barnes	160:16	Kline	Klein
N/A	161:2	Kline	Klein
Mr. Swindler	161:10	Kline	Klein
Mr. Swindler	163:5	Kline	Klein

Speaker	Page:Line No.	Transcript	Correction
Mr. Swindler	163:15	Kline	Kline
Mr. Swindler	166:6	Kline	Kline
Mr. Swindler	166:15	Kline	Kline
Judge Barnes	166:17	Kline	Kline
Mr. Swindler	169:6	Kline	Kline
Judge Barnes	171:21	Kline	Kline
N/A	173:3	Kline	Kline
Judge Barnes	173:6	Kline	Kline
Mr. Gentile	181:5	Which in my view, in our view, makes that other . . .	Which in my view, in our view, makes what other . . .
Dr. Cicchetti	184:5	A tariff if something that . . .	A tariff is something that . . .
Dr. Cicchetti	184:17	. . . those marketing letters where the customers were signed up.	. . . those marketing letters when the customers were signed up.
Dr. Cicchetti	188:23	. . . long run and customer benefits, and I said I'd better long run and customer benefits, and I said I'm better . . .
Dr. Cicchetti	192:11	. . . the sense that they were doing to benefit themselves the sense that they were doing it to benefit themselves . . .
Dr. Cicchetti	193:20-22	I don't think it was something that happened with HIKO being aware that they were doing it.	I don't think it was something that happened with HIKO being unaware that they were doing

Speaker	Page:Line No.	Transcript	Correction
			it.
Dr. Cicchetti	193:23	Kline	Klein
Dr. Cicchetti	195:19	Kline	Klein
Dr. Cicchetti	201:11	Kline	Klein
Dr. Cicchetti	208:22-23	... I don't think that HIKO came out of this better of I don't think that HIKO came out of this better off ...
Dr. Cicchetti	210:10	I think \$3 million is still to steep ...	I think \$3 million is still too steep ...

ATTACHMENT B

EX.-HIKO-Cicchetti-1

***Curriculum Vitae* for Charles J. Cicchetti, Ph.D.**

2015
CHARLES J. CICHETTI

PROFESSIONAL EXPERIENCE

2011-2014 Senior Advisor to Rothstein Kass & Company as Independent Consultant;

2008-present Senior Advisor to Navigant Consulting, Inc. as Independent Consultant;

1996-present Co-Founder, Pacific Economics Group, a California LLC;

1998-2006 Jeffrey J. Miller Professor in Government, Business, and the Economy, University of Southern California;

1992-1996 Managing Director, Arthur Andersen Economic Consulting;

1991-2008 Adjunct Professor, University of Southern California

1991-1992 Co-Chairman, Putnam, Hayes & Bartlett, Inc.;

1988-1991 Managing Director, Putnam, Hayes & Bartlett, Inc.;

1987-1990 Deputy Director, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University;

1984-1987 Senior Vice President, National Economic Research Associates;

1980-1984 Co-Founder and Partner, Madison Consulting Group;

1979-1986 Professor of Economics and Environmental Studies, University of Wisconsin-Madison;

1977-1979 Chairman, Public Service Commission of Wisconsin, Appointed by Governor Patrick J. Lucey (member until 1980);

1975-1976 Director, Wisconsin Energy Office and Special Energy Counselor for Governor Patrick J. Lucey, State of Wisconsin;

1974-1979 Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison;

1972-1974 Visiting Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison;

1972 Associate Lecturer, School of Natural Resources of the University of Michigan;

1969-1972 Resources for the Future, Washington, D.C.;

1969 Post Doctoral Research: Ph.D., Economics, Rutgers University;

1968-1969 Instructor, Rutgers University;

1965 B.A., Economics, Colorado College;

1961-1964 Attended United States Air Force Academy.

ADVISORY BOARDS

Faculty Advisor to Campus Republicans at USC, 2002 to 2005
Alliance for Energy Security; Former Member;

Association of Environmental and Resource Economics, Former Executive Committee, Former Member;
California ISO Market Advisory Group –Former Member appointed by Governor Gray Davis;
Center for Public Policy Advisory Committee, Former Member;
Department of Energy, Fuel Oil Marketing Advisory Committee, Former Member;
Graduate School of Public Policy at the University of California, Berkeley; Former Board Member;
National Association of Regulatory Utility Commissioners, Executive Committee and Chairman of the Ad Hoc Committee on the National Energy Act, Former Member;
Public Interest Economics Center, Board of Directors, Former Member;
Rutgers University, Energy Research Advisory Board;
U.S. Chamber of Commerce Energy and Natural Resources Committee, Former Member.

EDITORIAL BOARDS

Journal of Environmental Economics and Management, Former Member
Energy Systems and Policy, Former Member;
Land Economics, Former Editor.

PUBLICATIONS

Books and Monographs

“Why EPA’s Mercury and Air Toxics Rule is Good for the Economy and America’s Workforce”, July 2011.

The Results in Context: A Peer Review of EEL’s “Potential Impacts of Environmental Regulation in the U.S. Generation Fleet.: May 11, 2011.

Expensive Neighbors: The Hidden Cost of Harmful Pollution to Downwind Employers and Businesses; by Charles J. Cicchetti, Ph.D., prepared for Exelon in response to EPA’s proposed Transport Rule under the Clean Air Act; January 2011.

“The True Cost of Harmful Pollution to Downwind Families and Business”, written by Charles J. Cicchetti, Ph.D., prepared for Exelon in response to EPA’s proposed Transport Rule under the Clean Air Act, November, 2010.

“Economic Regulation and the Development of Integrated Energy Systems”, with Mike Cleland and Sean Conway, ICES Literary Series, v.1 September 2012.

Going Green and Getting Regulation Right: "A Primer for Energy Efficiency",
PUR Publishers, March 2009.

Natural Gas: the Other California Energy Crisis, Pacific Economics Group
Working Paper with Colin M. Long, November 2006.

The California Electricity Crisis: What, Why, and What's Next, with Jeffrey A.
Dubin and Colin M. Long, Kluwer Academic Publishers, July 2004.

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its Electricity Supply System, with Colin M. Long, August 2003.

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Energy Deregulation: The Benefits of Competition Were Undermined by
Structural Flaws in the Market, Unsuccessful Oversight and Uncontrollable
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J.A. Wright. California State Auditor, Bureau of State Audits, Sacramento,
California, March 2001.

Restructuring Electricity Markets: A World Perspective, with Kristina M. Sepetys,
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American Film Marketing Association, with W.E. Peale, Stefan Boedeker,
Jeffrey Dubin, Jeff Truitt, January 1995.

The Application of U.S. Regulatory Techniques to Spain's Electric Power
Industry, with Irwin M. Stelzer, prepared for Unidad Electrica, S.A.,
Cambridge: Energy and Environmental Policy Center, Harvard University,
March 1988.

The Economic Theory of Enhanced Natural Gas Service to the Industrial Sector:
An Applied Approach, Vol. II with L.D. Kirsch, for the Gas Research Institute,
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The Economic Theory of Enhanced Natural Gas Service to the Industrial Sector:
An Applied Approach, Vol. I with L.D. Kirsch and R. Shaughnessy, for the
Gas Research Institute, Contract No. 5080-380-0349, May, 1981.

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Lowry, M. Post and R. Schmidt, prepared for the Northeast Coalition for
Energy Equity, Madison: MCG Monograph, 1981.

The Marginal Cost and Pricing of Electricity: An Applied Approach, with W. Gillen and P. Smolensky, Cambridge: Ballinger Publishing Company, 1977.

The Costs of Congestion: An Econometric Analysis of Wilderness Recreation, with V.K. Smith, Cambridge: Ballinger Publishing Company, 1976.

Energy System Forecasting, Planning and Pricing, ed. with W. Foell for the National Science Foundation, Madison: University of Wisconsin Monograph, 1975.

Studies in Electric Utility Regulation, ed. with J. Jurewitz for the Ford Foundation Energy Policy Project, Cambridge: Ballinger Publishing Company, 1975.

Perspective on Power: A Study of the Regulation and Pricing of Electric Power, with E. Berlin and W. Gillen for the Ford Foundation Energy Policy Project, Cambridge: Ballinger Publishing Company, 1974.

A Primer for Environmental Preservation: The Economics of Wild Rivers and Other Natural Wonders, New York: MSS Modular Publication, 1973.

Forecasting Recreation in the United States: An Economic Review of Methods and Applications to Plan for the Required Environmental Resources, Lexington: Lexington Books, June 1973.

Alaskan Oil: Alternative Routes and Markets, for Resources for the Future, Baltimore: Johns Hopkins University Press, December 1972.

The Demand and Supply of Outdoor Recreation: An Econometric Analysis, Ph.D. Thesis: Rutgers University, 1969. Also, with J.J. Seneca and P. Davidson, Washington, D.C.: U.S. Department of Interior, Bureau of Outdoor Recreation, Contract No. 7-14-07-4, 1969.

A Neo Keynesian Equilibrium Analysis For an Open Economy, A.B. Thesis, Colorado College, Colorado, Springs, Colorado, May, 1965.

PUBLICATIONS

Journal Articles

“Inflated Numbers; Erroneous Conclusions: The Navigant Wind Jobs Report”, American Energy Alliance, The National Center for Public Policy Research, March 2013.

“Economic Regulation and the Development of Integrated Energy Systems”, with Mike Cleland and Sean Conway, ICES Literary Series, v.1 September 2012.

PROFESSIONAL EXPERIENCE

- "Technology for the Masses: The Consumer-centric Smart Grid and its Challenge for Regulators" with Philip Mause, Public Utilities Fortnightly, October 2011.
- "Duke's Fifth Fuel", Public Utilities Fortnightly, January 2008.
- "Public Service Commission of Wisconsin, 1977-1980" Charles J. Cicchetti, The NRRRI Journal of Applied Regulation, Volume 4, December 2006
- "A Brief History of Rate Base: Necessary Foundation of Regulatory Misfit" with Charles J. Cicchetti, Public Utilities Fortnightly, July 2006.
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- "Mergers and the Convergence of the Electric and Natural Gas Industries," Natural Gas, March 1997.
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- "A Micro-Econometric Analysis of Risk-Aversion and the Decision to Self-Insure," with Jeffrey Dubin, in Journal of Political Economy, Revised, July 1993. (Volume 102, No. 1, February 1994.)

- "Energy Utilities, Conservation, Efficiency," with Vinayak Bhattacharjee and William Rankin, Contemporary Policy Issues, Volume XI, Number 1, January 1993.
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- "A Micro-Econometric Analysis of Risk Aversion and the Decision to Self-Insure," California Institute of Technology, with Jeffrey A. Dubin, January 1992.
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- "Incentive Regulation: Some Conceptual and Policy Thoughts," Energy and Environmental Policy Center, Harvard University, Discussion Paper E-89-09, June 1989.
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- "Evaluating Federal Water Projects: A Critique of Proposed Standards," with R.K. Davis, S.H. Hanke and R.H. Haveman, Science, Vol. 181, August 1973.
- "The Mandatory Oil Import Quota Program: A Consideration of Economic Efficiency and Equity," with W. Gillen, Natural Resources Journal, Vol. 13, No. 3, July 1973.
- "Congestion, Quality Deterioration and Optimal Use: Wilderness Recreation in the Spanish Peaks Primitive Area," with V.K. Smith, Social Sciences Research, Vol. 2, 1, March 1973 (reprinted July 1973).
- "The Economics of Environmental Preservation: A Theoretical and Empirical Analysis," with A.C. Fisher and J.V. Krutilla, American Economic Review, Vol. 62, No. 4, September 1972.
- "Recreation Benefit Estimation and Forecasting: Implications of the Identification Problem," with V.K. Smith, J.L. Knetsch and R. Patton, Water Resources Research, Vol. 8, No. 4, August 1972.
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- "Option Demand and Consumer Surplus: Further Comment," with A.M. Freeman III, Quarterly Journal of Economics, Vol. 85, August 1971.
- "Some Economic Issues Involved in Planning Urban Recreation Facilities," Land Economics, February 1971.
- "A Note on Jointly Supplied Mixed Goods," with V.K. Smith, Quarterly Review of Economics and Business, Vol. 10, No. 3, Autumn 1970.
- "A Gravity Model Analysis of the Demand for Public Communication," with J.J. Seneca, Journal of Regional Science, Vol. 9, No. 3, Winter 1969.

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- "Meeting the Nation's Future Electricity Needs: Cogeneration, Competition and Conservation," in 1989 Electricity Yearbook, New York: Executive Enterprises, 1989.
- "Environmental Litigation and Economic Efficiency: Two Case Studies," with R. Haveman in Environmental Resources and Applied Welfare Economics: Essays in Honor of John F. Krutilla, V.K. Smith ed., Washington, DC: Resources for the Future, 1988.
- "Electricity and Natural Gas Rate Issues," with M. Reinbergs, in The Annual Energy Review, Palo Alto: Annual Reviews Inc., Vol. 4, 1979.
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- "Measuring the Price Elasticity of Demand for Electricity: The U.S. Experience," with V.K. Smith, in Energy System Forecasting, Planning and Pricing, ed. C.J. Cicchetti and W. Foell, Madison: University of Wisconsin Press, 1975.
- "Public Utility Pricing: A Synthesis of Marginal Cost, Regulatory Constraints, Averch-Johnson Bias, Peak Load and Block Pricing," with J. Jurewitz, in Studies in Electric Utility Regulation, ed. C.J. Cicchetti and J. Jurewitz, Cambridge: Ballinger Publishing Company, 1975.
- "Congestion, Optimal Use and Benefit Estimation: A Case Study of Wilderness Recreation," with V.K. Smith, in Social Experiments and Social Program Evaluation, ed. J.G. Albert and M. Kamrass, Cambridge: Ballinger Publishing Company, 1974.
- "Electricity Growth: Economic Incentives and Environmental Quality," with W. Gillen, in Energy: Demand, Conservation and Institutional Problems, ed. M. Macrakis, Cambridge: MIT Press, 1974.
- "Some Institutional and Conceptual Thoughts on the Measurement of Indirect and Intangible Benefits and Costs," with John Bishop, in Cost-Benefit Analysis and Water Pollution Policy, ed. H. Peskin and E. Seskin, Washington, D.C.: Urban Institute, 1974.

"The Trans-Alaska Pipeline: An Economic Analysis of Alternatives," with A.M. Freeman III, in Pollution, Resources and the Environment, ed. A.C. Enthoven and A.M. Freeman III, New York: W.W. Norton and Co., 1973.

"Alternative Uses of Natural Environments: The Economics of Environmental Modification," with A.C. Fisher and J.V. Krutilla, in Natural Environments: Studies in Theoretical and Applied Analysis, ed. J.V. Krutilla, Baltimore: Johns Hopkins University Press, 1972.

"A Multivariate Statistical Analysis of Wilderness Users in the United States," in Natural Environments: Studies in Theoretical and Applied Analysis, ed. J.V. Krutilla, Baltimore: Johns Hopkins University press, 1972.

"Benefits or Costs? An Assessment of the Water Resources Council's Proposed Principles in Standards," with R.K. Davis, S.H. Hanke, R.H. Haveman and L. Knetsch, in Benefit-Cost and Policy Analysis, ed. W. Niskanen, *et al*, Chicago: Aldine Publishing Company, 1972.

"Observations on the Economics of Irreplaceable Assets: Theory and Method in the Social Sciences," with J.V. Krutilla, A.M. Freeman III and C. Russell, in Environmental Quality Analysis, ed. A. Kneese and B.T. Bower, Baltimore: Johns Hopkins University Press, 1972.

"Outdoor Recreation and Congestion in the United States," in Population, Resources and the Environment, ed. R. Ridker, Washington, D.C.: U.S. Government Printing Office, 1972.

Less Technical Articles

"Still the Wrong Route," Environment, Vol. 19, No. 1, January/February, 1977.

"National Energy Policy Plans: A Critique," Transportation Journal, Winter 1976.

"The Mandatory Oil Import Program: A Consideration of Economic Efficiency and Equity," with W. Gillen, Joint Economic Committee of the U.S. Congress, 1974.

"The Political Economy of the Energy Crisis," with R. Haveman in Carroll Business Review, Winter 1974.

"The Wrong Route," Environment, Volume 15, No. 5, June 1973.

"Benefit-Cost Analysis and Technologically Induced Relative Price Changes: The Case of Environmental Irreversibilities," with J.V. Krutilla, Natural Resources Journal, 1972.

"A Review of the Empirical Analyses that Have Been Based Upon the National Recreation Surveys," Journal of Leisure Research, Vol. 4, Spring 1972.

"How the War in Indochina is Being Paid for by the American Public: An Economic Comparison of the Periods Before and After Escalation," Public Forum, July 1970, (reprinted in the Congressional Record, August 13, 1970).

"User Response in Outdoor Recreation: A Reply," with J.J. Seneca, Journal of Leisure Research, Vol. 2, No. 2, Spring 1970.

"User Response in Outdoor Recreation: A Production Analysis," with J.J. Seneca, Journal of Leisure Research, Vol. 1, No. 3, Summer 1969.

Miscellaneous Articles

"Competitive Battlefield: A View from the Trenches," Northeast Utilities 1987 Annual Report, Competition: A Matter of Choices, 1987.

SPEECHES

Speeches Since 1984

"California: Going Green and Getting Regulation Right", Law Seminars International 11th Annual Conference on Energy in California, San Francisco, California, September 15, 2009.

"The Business Case For Energy Efficiency", CS Week Conference, Washington, D.C., May 21, 2009.

"Back to The Future: Energy Planning and Lessons for the 1970's", Third Annual Nelson Institute Earth Day Conference, Madison, Wisconsin, April 22, 2009.

"Energy Efficiency and Regulatory Incentives," EUEC 11th Annual Energy and Environment Conference, Tucson, Arizona, January 27-30th, 2008.

"Conservation Reconsidered: A First Row Seat," Reconsidering "Conservation Reconsidered": A 40-Year Legacy, Resources for the Future, October 3, 2007.

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- "State Regulation Is Here to Stay: Financing the Future," NARUC 113th Annual Convention, Philadelphia, Pennsylvania, November, 2001.
- "Deregulation Revisited: The Power Crisis in California," New York University's Energy Forum, New York, New York, 26 February 2001.
- "The Changing Face of Utilities," Author Anderson's 21st Annual Energy Symposium, Houston, Texas, 28 November 2000.
- "Lessons for Bangladesh: Thinking Globally While Acting Locally," The World Bank's Bangladesh Power Sector Reforms Workshop, Dhaka, Bangladesh, 1 October 2000.
- "Diversification and Shareholder Value," The Energy Daily's 27th Annual Conference: Lighting the World, Williamsburg, Virginia, 2 December 1999.
- "Challenges for Government-Owned Utilities," The Bond Buyer Public Power Conference, Santa Monica, California, 7 October 1999.
- "Restructuring America's Electricity Industry and Public Power or Customer Owned Utilities," APPA's CEO Roundtable, Scottsdale, Arizona, 3 March 1998.
- "Electricity Restructuring: The Future Role of Regulation (Woulda, Shoulda, Coulda)' American Bar Association's Annual Electricity Conference, Denver, Colorado, 13 February 1998.
- "Mergers in the Utility Industry," Arthur Anderson's 18th Annual Energy Symposium, Houston, Texas, 9 December 1997.

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- "Convergence, Competition, Mergers and Marketing: Are You Getting Ready for the Millennium?" California Foundation on the Environment and the Economy, Santa Cruz, California, 4 December 1997.
- "Electric Utility Strategy: Regulation, Restructuring and Competition," The Fourth Annual Power Industry Forum: "A View Toward the New Energy Corporation," San Diego, California, 7 March 1997.
- "Restructuring Energy Markets: A World Perspective," The Energy Daily's 22nd Annual Conference: The One-Stop Energy Stop, Williamsburg, Virginia, 12 December 1996.
- "Mergers in the Utility Industry," Arthur Anderson's Energy Symposium, Houston, Texas, 10 December 1996.
- "Political, Economic, and Regulatory Challenges when Transforming Privately-Owned Utilities to Competitive Enterprises," Presentation at the Economist Conferences, Bilbao, Spain, 12 November 1996.
- "Transmission, Divestiture, and the Future," Panelist at the EEI Strategic Planning Conference, Seattle, Washington, 14 October 1996.
- "Cost-of-Service Regulation: The Old Dog Won't Hunt, and Recently, It Wasn't Very Good," Presentation to the Board of Wisconsin Electric Power Company, Belize, Central America, 3 April 1996.
- "Primary Mergers: An Insider's Guide," Presented at Electricity Utility Week Conference, March 15, 1996.
- "Merger Policy Issues—When is a Proposed Electric Utility Merger in the Public Interest?" Panelist at the 3rd Annual DOE-NARUC National Electricity Forum, 5 December 1995.
- "Measuring the Effects of Natural Resources Damage and Environmental Stigma on Property Value," Presented to Morgan, Lewis & Bockius, 29 November 1995.
- "Strategy for a Natural Gas Distributor: Competition, Consolidation, Cost Cutting," for Washington Gas Light, 23 October 1995.
- "Strategic Issues Facing the Electric Utility Industry," AIS Symposium, St. Charles, IL, 9 October 1995.
- "Worldwide Electricity Restructuring: Regulation, Competition or Both?" presented at the 4th World Economic Development Congress, Washington, DC, 6 October 1995.

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- "Competition, Consolidation, Restructuring: A Program for Expanding Utility Consulting," Western Region Utility Presentation, 28 September 1995.
- "North/South Estimated Savings Compared to Recent Merger Claimed Savings," for PSCo information only, July 28, 1995.
- "California PUC Plans for Restructuring the Electric Industry," Utilities Overheads, 3 July 1995.
- "Public Utility Holding Company Act (PUHCA) Current Issues," Utilities Overheads, 3 July 1995.
- "Power Industry Restructuring: Competition and Deregulation are Not Synonyms," Utilities Overheads, 3 July 1995.
- "The FERC's Role in Electric Utility Industry Restructuring," Utilities Overheads 3 July 1995.
- "Where to Regulation? Slice and Dice Supplants Command and Control," HARC Presentation, 8 August 1995/
- "Strategic Issues Facing the Electric Utility Industry," US West Presentation, 1 August 1995.
- "Proposal to Provide Consulting Services to Assist with An Alternative Ratemaking Proposal," Boston Gas Presentation, 27 July 1995.
- "Strategic Issues Facing the Electric Utility Industry," ConEd Presentation, 26 July 1995. (Also "Power Thinking")
- "Generic NU Slides"
- "Strategic Issues Facing the Electric Utility Industry," NU Board of Trustee Presentation, 25 July 1995.
- "Public Utility Holding Company Act (PUHCA)" Presentation to Southwest Gas Corporation, 19 June 1995.
- "FERC Activity-Gas Industry Update," Presentation to Southwest Gas Corporation, 19 June 1995.
- "Electric Industry Restructuring Recent FERC and CPUC Developments," Presentation to Southwest Gas Corporation, 19 June 1995.

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- "Power Marketing and Bulk Power Markets: Power Marketing and its Impact on the Electric Power Industry," Infocast's Power Marketing and Bulk Power Markets, 8 June 1995.
- "Energy Industry in Transition," Yankee Energy Systems presentation, 23 May 1995.
- "State Regulation in an Era of Regulated Competition," American Enterprise Energy Policy Forum, 16 May 1995.
- "Natural Resource Damages Latest Developments and Future Focus," The CVM Controversy. Executive Enterprises NRDA Conference, 5 May 1995, San Francisco.
- "Restructuring the Electric Industry," Prepared for Georgia Power Company, 28 March 1995.
- "Electric, Gas and Telephone Industry Insights and Outlooks," Prepared for Peoples Energy Corporation Officers' Planning Retreat, 12 March 1995.
- "The Driving Forces Reshaping the Electric Power Industry," Presentation to Northeast Utilities Management, 27 February 1995.
- "Electricity Markets: Yesterday, Today, and Tomorrow," and "The Driving Forces Reshaping the Electric Power Industry," Presentation to General Electric, 13 February 1995.
- "Power Marketing and Its Role in the Competitive Energy Industry: Projecting Future and International Power Needs," EEI Conference, 27 January 1995.
- "Evolution or Revolution: Whoever Gets the Customers Wins!" Energy Daily Conference, 1 December 1994.
- "Natural Resource Damages Latest Developments and Trends: CVM Controversy," Executive Enterprise's NRDA Conference, 15 November 1994.
- "The Current Natural Gas Transportation Issues that Affect the North American Market," IGUA/ACIG Natural Gas Conference, 15 November 1994.
- "Power Marketing and Its Role in the Competitive Energy Industry: Projecting Future and International Power Needs," Infocast-New York, 28 October 1994.
- "FERC and State Regulatory Incentives: Restructuring the Electric Utility Industry," Arthur Andersen's Financial Symposium, 27 September 1994.

- "Restructuring the Electric Utility Industry," Arthur Andersen's Financial Symposium, 27 September 1994.
- "What Do We Want to Get Out of the CPUC Restructuring Process," Aspen Institute Presentation Materials, 6 July 1994.
- "The Debate over Retail Competition in California: A Prescriptive Suggestion," Aspen Institute Presentation Materials, 6 July 1994.
- "A Review and Critique of Internal Revenue Service Economist Report Regarding Electricity Conservation Program Expenditures and Related Tax Deductions," EEI Taxation Committee Meeting, 14 June 1994.
- "The Expanding Competition in Power Markets," Environmental Law, Liability & Litigation Director's Roundtable, 18 May 1994.
- "Paul Keglevic's Group Presentation to The Gas Company: Customer Values Initiative."
- "NRDA and Property Valuation Analysis," presented to Fennemore Craig, P.C., 28 February 1994.
- "Commentary on the Future of Regulation: Pro or Kahn?" (To Regulate or Not to Regulate: That is the Question," NARUC/DOE presentation, 15 February 1994.
- "Latin America Assertion of Membership in Pacific Basin," Aspen Institute, Pac Rim Workshop, 31 January 1994.
- "Utility Rate Regulation in the 1990s and Beyond," 1993 Utilities Financial Symposium, 14 September 1993.
- "Natural Resource Damages: An Economic Critique," Presented to Beveridge & Diamond (w/J. Dubin), 8 September 1993.
- "Understanding Economic Damage Valuations Under NRDA," Presented to Occidental USA, (w/L/ Wilde), 17 August 1993.
- "Allocating Costs in Superfund Cases," Presented to Waste Management, July 1993.
- "Understanding Economic Damage Valuations Under NRDA," Presented to Sidley & Austin, 29 June 1993.
- "Allocating Cost in Superfund Cases," Presented to Keck, Mahin & Cate, 23 June 1993.

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- "Draft RCRA Corrective Action Regulatory Impact Analysis (RIA)," Presented to Beveridge & Diamond, 18 June 1993.
- Chicago Energy Economic Association Speech, (CJC used notes/speech from UC Berkeley/RFF speech of 10 May 1993), 10 June 1993.
- "Understanding Economic Damage Valuations Under NRDA," AAEC Corporate Counsel Symposium Series (Dallas & Houston), May 18-19, 1993.
- "The Regulatory Triad for the 90s: Integrated Resource Planning, Incentive, Regulation and Social Costing," UC Berkeley/RFF Briefing, 10 May 1993
- "Understanding Economic Damage Valuation Under NRDA," AA/Perkins Coie Presentation, 4 May 1993.
- "DSM & Shareholder Incentive," 1993 Rate Symposium, April 25-27, 1993.
- "Twenty Years Since Earth-Day I: What Have We Learned?" USC Economic Honor Society Omicron, Delta Epsilon, 15 April 1993.
- "The Clinton Economic Plan," USC Panel Discussion, 26 February 1993.
- "The Good, The Bad & The Ugly," USC, 25 February 1993.
- "Incorporating Externalities in Utility Least-Cost Planning," Edison Electric Institute, 10 February 1993.
- "Incorporating Externalities in Utility Least-Cost Planning," A Presentation to the ABA Mid-Year Meeting, 7 February 1993.
- "Understanding Economic Damage Valuations Under NRDA," Presented at "OPA-On the Gulf Coast," Seminar, sponsored by Haight, Gardner, Poor & Havens, 27 January 1993.
- "DSM and Shareholders Incentives," Prepared for Southern California Edison, January 1993.
- "DSM and Shareholders Incentives," Prepared for the Allied Social Science Association 1993 Annual Meetings, 5 January 1993.
- "The Economic Effect of the Clean Air Act on the US Economy: Tradable Emissions Allowances," National Clean Air Conference, Houston, Texas, May 20, 1992.

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- "Where Do We Go From Here: Bush or Clinton?" Presented at the Corporate Recovery Conference sponsored by Arthur Andersen & Co., Scottsdale, Arizona, September 17, 1992.
- "Social Cost of Electricity," Panel Discussant, Anaheim, California, January 5 & 6, 1993.
- "Environmental Externalities: Are There Any Left?" American Bar Association's Winter Meeting, Boston, Massachusetts, February 7, 1993.
- "Incorporating Externalities in Utility Least-Cost Planning," Edison Electric Institute Energy and Environmental Committee, San Francisco, California, February 10, 1993.
- "Environmental Policy: The Good, The Bad, The Ugly," University of Southern California, Los Angeles, February 25, 1993.
- "Incorporating Environmental Strategies into Your Corporation's Overall Strategy to Improve the Bottom Line," moderator, Arthur Anderson & Co's Energy 1993 Expo, Pittsburgh, Pennsylvania, March 2-3, 1993.
- "Resource Planning, Incentives, and Pricing for Electric, Natural Gas, and Telecommunications Services: New Products and Regulations," University of Missouri's 1993 Rate Symposium, Kansas City, Missouri, April 26, 1993.
- "Understanding Economic Damage Valuations Under Natural Resource Damage Assessments," Environmental Presentation Series with Perkins Coie, Seattle, Washington, May 4, 1993.
- "The Regulatory Triad for the 90's," Resources for the Future/UC Berkeley Briefing, Berkeley, California, May 10, 1993.
- "Understanding Economic Damage Valuations Under Natural Resource Damage Assessments," Arthur Andersen & Co. Corporate Counsel Symposium Series, Dallas, Texas, May 18, 1993.
- "Understanding Economic Damage Valuations Under Natural Resource Damage Assessments," Arthur Andersen & Co. Corporate Counsel Symposium Series, Houston, Texas, May 19, 1993.
- "An Economist's View of Demand Side Management," Chicago Energy Economists Association, Chicago, Illinois, June 10, 1993.
- "Presentation to the Board of Southwest Gas," Las Vegas, Nevada, June 14, 1993.

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- "Draft RCRA Corrective Action Regulatory Impact Analysis (RIA)," Beveridge & Diamond, June 18, 1993-Charlie Cicchetti.
- "Relative Economic Benefit as a Factor in Cost Allocation," Keck, Mahin & Cate Cost Recovery and Contribution Litigation Seminar, Chicago, Illinois, June 23, 1993.
- "Where Do We Go From Here: Bush or Clinton?" Presented at the Corporate Recovery Conference sponsored by Arthur Andersen & Co., Scottsdale, Arizona, September 17, 1992.
- "The Economic Effect of the Clean Air Act on the U.S. Economy: Tradable Emissions Allowances," National Clean Air Conference, Houston, Texas, May 20, 1992.
- "National Resource Damages: What Does the Proposed Final DOI Rule Mean?," Presented at the Workshop on Natural Resource Damages, Washington, DC, May 30, 1991.
- "When Green Turns Mean: Pollution as a Crime", Presented at the Third Annual Law and Economics Seminar of Putnam, Hayes & Bartlett, Inc., The Arizona Biltmore Hotel, Phoenix, Arizona, November 7-11, 1990.
- "The Legal and Economic Consequences of 1992." Presented at the Second Workshop on Post Keynesian Economics, Knoxville, Tennessee, July 3, 1990.
- "Environment: A Green Gimmick or a New Game Plan?," Presented at Pacific Gas & Electric Company's Managers Meeting, San Francisco, California, May 31, 1990.
- "Can the Gas Business Fulfill Its New Promise?" Presented at "Inside F.E.R.C.", San Francisco, California, April 20, 1990.
- "Energy Firms and Global Environmental Policy." Presented at Pacific Gas & Electric's Management Committee Retreat, Santa Cruz, California, March 17-26, 1990.
- "Electric Utility Mergers and Reorganization: Antitrust Meets Regulation." Presented at the Third Annual Conference on Electric Law and Regulation, Denver, Colorado, March 9, 1990.
- "Infrastructure, Regulatory, Risk/Reward Issues." Presented at the Portland General Symposium, Portland, Oregon, November 6, 1989.

- "Belated and Expensive: How Utilities Have Reacted to New Economic Imperatives in the Last Two Decades," Conference Sponsored by the Energy Daily, The Watergate Hotel, Washington, D.C., November 3, 1989.
- "Competitive Building: Price, Time, Location and Uncertainties." Presented at the Coopers & Lybrand Annual Electric & Gas Conference, Crystal Gateway Marriot, Arlington, VA, November 2, 1989.
- "Electric Utilities: New Markets, New Challenges," Speech before the Interstate Natural Gas Association of America Seminar, The Greenbrier, White Sulphur Springs, West Virginia, October 17, 1989.
- "Sweetening the Pot: Plaintiff Devices to Maximize Claims" (Contingent Value Surveys Hedonic Price Measures), Second Annual Law and Economics Seminar a Putnam, Hayes & Bartlett, Inc, The Arizona Biltmore Hotel, Phoenix, Arizona, October 11-14, 1989.
- "Incentive Regulation and Conservation Policy," Presented at the New England Conference of Public Utility Commissioners, Kennebunkport, Maine, September 2, 1989.
- "Incentive Regulation and Conservation Policy," Presented at the New England Conference of Public Utility Commissioners (NARUC) Least-Cost Planning Conference, Charleston, South Carolina, September 11, 1989.
- "The Role of Rate Reform: The Bundling of Services," International Association of Energy Economists, North American Gas Supply and Markets Conference, The Hyatt Regency, Denver, Colorado, September 7, 1989.
- "Incentive Regulation: What Works and What Doesn't." Presented at the Great Lakes Conference of Public Utility Commissioners, The Greenbrier, White Sulphur Springs, West Virginia, July 11, 1989.
- "New Proposals for Incentive Regulation in the Electric Utility Industry," Chief Executives' Forum, Key Largo, Florida, Sponsored by the First Boston Corporation and Putnam, Hayes & Bartlett, Inc., February 9-12, 1989.
- "Current Trends in Regulation and Some New Proposals to Alter Incentives in the Electric Utility Industry," Harvard Utility Forum Meeting, Cambridge, MA, February 1, 1989.
- "Some New Proposals to Introduce Incentive Tariffs in the Electric and Natural Gas Industries," Utility Discussion Group, Held by Putnam, Hayes & Bartlett, Inc., Capital Hilton, Washington, D.C., January 5, 1989.

- "Privatization in Developing Countries: Case Studies of Electricity in Turkey and Pakistan," EESIG Brown-Bag Lunch, December 14, 1988.
- "Some New Proposals to Introduce Incentive Tariffs in the Electric and Natural Gas Industries," Harvard Utility Forum – Harvard Gas Forum Demand-Side Bidding/Alternatives to Rate Base Regulation Workshop, Cambridge, MA, December 13, 1988.
- "The March Towards a Competitive Gas Industry: Obligation to Serve, Incentive Regulation, and Risk Allocation," The Interstate Natural Gas Association of America Seminar, Washington, D.C., December 2, 1988.
- "Pricing and Contracting Issues and Experience." Presented at the AIT/ASEAN Senior Executive Seminar, Hua Hin, Thailand, November 9-11, 1988.
- "Meeting the Nation's Future Electricity Needs: Cogeneration, Competition and Conservation." Presented at the 100th Annual Convention and Regulatory Symposium of the National Association of Regulatory Utility Commissioners, San Francisco, California, November 2, 1988.
- Speech before the New Dimensions in Pricing Electricity Conference of Niagara Mohawk Power Corporation and the Electric Power Research Institute, "Cogeneration and Competition", Syracuse, New York, September 30, 1988.
- Speech before the Second Annual Conference of the American Cogeneration Association, "Cogeneration and Competition," Chicago, Illinois, September 26, 1988.
- Presentation before the American Bar Association Annual Meeting, Toronto, Ontario, Canada, August 8, 1988.
- Comments Before the American Bar Association First Annual Conference on Electricity Law and Regulation, Denver, Colorado, April 7-8, 1988.
- Speech at Inside F.E.R.C.'s Eight Annual Conference, "After the Chaos: Gas Strategies for the Long Term," New Orleans, Louisiana, March 21-22, 1988.
- "Wholesale Electricity, Old Scar-Tissue: New Wounds Versus New Solutions," before the National Governors' Association, Washington, D.C., December 10, 1987.
- "U.S. Economic Regulation of Electricity," with Miles Bidwell, NERA Seminar, London, England, June 26, 1987.

"State Regulation in the Natural Gas Revolution," presented at Proceeding of Gas Mart '87, The First National Trade Fair for Natural Gas, sponsored by Natural Gas Intelligence, Washington, D.C., May 3-5, 1987.

"Can Natural Gas Deregulation be a Model for the Electric Industry?" Speech given at the First Rutgers/New Jersey Department of Commerce Annual Conference on Energy Policy in the Middle Atlantic States, February 20, 1987 (also published in Energy Deregulation and Economic Growth).

"Marketing Strategies for Natural Gas Distributors in the 1900s," before the Gas Utility Managers Conference Sponsored by the New England Gas Association, September 7-9, 1986.

"Conservation and Cogeneration: The Utilities' Friends or Foes?" with M. Berkman, S. Curkendall and H. Parmesano, before the NERA Electric Utility Conference, Scottsdale, Arizona, February 12-15, 1986.

"The Future Competitive Environment for Utilities," remarks prepared for Dayton Power & Light Company 1985 Interdivisional Meeting, December 9, 1985.

Presentation before the Ohio Electric Association, Cincinnati, Ohio, October 23, 1985.

"The FERC's Recent Interest in Wheeling and Carriage," co-authored by Robert D. Obeiter, before the Ninth Annual News Media Seminar, Columbus, Ohio, and the Third NARUC Electric Research and Development Seminar, St. Charles, Illinois, October 22, 1985.

"The Regulatory World of Natural Gas: Are We Quitting the Game or Changing the Rules?" before the Natural Gas Supply Association 1985 Annual Meeting, Miami, Florida, October 10, 1985.

"Marginal Cost and Competition: Unbundling Natural Gas Carriage," before the Advanced Seminar in Gas Pricing Policies, Sponsored by the American Gas Association, College Park, Maryland, October 8, 1985.

"Commingle Competition with Regulation: Closing the Circle or Quitting the Game," before the Iowa Investor-Owned Utilities Management Conference, Waterloo, Iowa, October 7, 1985.

"The State Regulator in a Free Gas Market," Comments Presented at a Conference Sponsored by The Gas Daily, Chicago, Illinois, August 1985.

"Grafting Competition Onto Regulation: The Problems and The Promise," before the Iowa State Regulatory Conference, Ames, Iowa, May 1985.

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"Comments Before The Workshop on Current Antitrust Issues in Public Utility Industries, sponsored by the American Bar Association, Washington, D.C., March 1985.

"Yesterday, Today and Tomorrow," Comments before the IEEE Winter Power Meeting, New York, New York, February 5, 1985.

"Natural Gas: The Eggs Have Been Scrambled, Now What?" Before the National Association for Regulatory Utility Commissioners Annual Meeting, Los Angeles, California, November 1984.

"The Performance of the Regulation of Public Utilities in the U.S., "A NERA Seminar: Is American-Style Regulation Appropriate to the UK?," London, England, October 1984.

The At Rann II Symposium, Prepared Summary of NSF Study to Provide a Practical Guide for the Analysis of the Marginal Cost Structure of Electric Utilities for the Purpose of Designing Electricity Tariffs, Washington, D.C., November, 1976.

Prepared Remarks "Non-Waste Technology and Production," presented at the NWT Seminar, Seminar on the Principles and Creation of Non-Waste Technology, Paris, France, November, 1976

The Advest Seminar comments entitled "Meeting Experiments," at New York, New York, October, 1976.

The Annual Meeting of American Economics Association," Nixon-Ford National Policy Plans: A Critique." Atlantic City, New Jersey, September, 1976.

The NARUC annual Regulatory Studies Program, Prepared Remarks "Excerpt from the Marginal Cost and Pricing of Electricity: An applied Approach," East Lansing, Michigan, August, 1976.

Prepared Remarks before the 1976 Symposium on Rate Design Problems of Regulated Industries, "The Marginal Cost of Electricity and Continuing Rate Controversies," Kansas City, Missouri, February, 1976.

Prepared Remarks before the Wisconsin Manufacturing Association in Stevens Point, Wisconsin, September, 1975.

Prepared remarks "The Time has Come to Speak Out On Our Energy and Economic Crisis," Madison, Wisconsin, March, 1975.

Prepared Remarks before The American Association for the Advancement of Science at the Minnesota Energy Agency Conference, 1975. "Energy Pricing in the United States: A Critique," 1975

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Columbia Circuit, Brief of Charles J. Cicchetti, as *Amici Curiae* in Support of Petitioners, July 14, 2009.

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U.S. v. Motorola. Prepared statistical analyses of property values and ground water for Phoenix metropolitan area (early 1990s).

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ATTACHMENT C

EX.-HIKO-Cicchetti-2

APPENDIX A

Statistical Analysis

Statistical Analysis of the Relationship Between Natural Gas Prices and the Severe Weather Coupled with Unfettered Price Discretion in Canada

I hypothesize that the TCP's unanticipated and unexpected price short term transportation price increases for natural gas on the TCP Mainline exacerbated the weather-related price increase for key hubs on and/or interdependent with the TCP system.

I examine the possibility of this potential effect at three hubs that would influence natural gas and, thus, electricity prices in the PJM and other electricity markets that very likely affected electricity markets in Pennsylvania. I selected three locations/markets on the TCP Mainline: Emerson, Dawn, and Iroquois. Emerson is the point where TCP crosses into the U.S. located at the border of Manitoba and North Dakota. The Dawn hub is a very liquid trading market just over the border in Ontario, Canada. This is where natural gas is traded and moves between the two nations. The Iroquois hub located at the U.S./Canadian border at Waddington, New York. The latter two hubs affect natural gas prices in the northeast, which in turn affect PJM electricity prices.

The minimum IT bid floor price increases were very high on about 10% of the days at these three nearby hubs. The minimum IT bid floor prices for transportation were sometimes more than 100% and, sometimes, even as high as about 400% greater than corresponding Henry Hub commodity prices. There were 316 days in the sample data I used.

On more than 90% of the days, there were no unusually high minimums for IT bid prices at these three locations. Therefore, I do not hypothesize that much would be happening in terms of any exceptional day-to-day percent change in the minimum IT bid

floors except for about 30 days, or less than 10% of the time, at each location that had atypical IT bid floors.

When these days occurred, I hypothesize there would be a corresponding subsequent effect on natural gas prices. I use Henry Hub prices along with the minimum IT bid floor prices to “explain”, i.e. test hypotheses related to, the natural gas commodity price movements at these three hubs. I test for the hypothesized change in commodity prices between atypical days with very high minimum IT bid floor prices, 200 percent above a thirty-day rolling average transportation price, and the more than 90 percent of typical days with no such minimum IT bid floor price jump.

I also adjust for weather using a weather index for Canadian locations. I use a measure of how much colder it was in Canada by dividing the 2013/14 cumulative heating degree-days for the November through March months by the corresponding value for the same cumulative degree-day index for 2012/13. (I use Winnipeg’s weather-related data for Emerson, Toronto’s data for Dawn, and Ottawa’s data for Iroquois.)

I express the price variables in logarithmic form in my statistical analyses. This allows me to interpret the regression coefficients for the price variables in the regressions as measuring the percent changes in prices in response to the percent change in the causal factors I hypothesized to matter.

I use a maximum likelihood estimation approach called an auto-regressive GLS method to estimate the statistics efficiently, while testing the hypotheses posed. I specify the direction of causation that the underlying facts and timing support. I rely on two things. First, TCP explained that it “posts bid floors in advance of actual trading. This allows the market the opportunity to analyze the bid floors posted and consider the

changing dynamics in the market.” Second, I emphasize the causal direction “with and without” using a one-day lag in the minimum IT bid floor prices.

The specific estimation is a Yule-Walker autoregressive regression analyses from the SAS statistical package. I attach the non-lagged results in Appendix B-1 for Emerson, Dawn, and Iroquois. The Yule-Walker method that I selected preserves the original specification, while improving statistical efficiency. I use both a restricted first order estimate, as well as an unrestricted approach with as many as five autoregressive orders of lag. My conclusions based on the two approaches do not change.

The model specification is that the logarithm of Day Ahead commodity prices, set later in the day of the corresponding logarithm of minimum IT bid floor prices, would track the logarithm of Henry Hub commodity prices and cumulative nearby heating degree day values. On days when the logarithm of the minimum IT bid floor prices exceeded the rolling 30-day average logarithm of minimum IT bid floor price by 200 percent, the atypical logarithm of the IT minimum bid floor price set earlier that same day would also affect the logarithm of the commodity price.

The natural logarithm specification means that the estimated regression coefficients measure the effect the independent or explanatory percent price changes have on the percent change in the dependent variables (i.e., commodity prices) at the specific locations. This specification also tests the significance of the relationship and reflects the central question related to what I call the “unintended consequence hypothesis.” The GLS estimate improves the efficiency of the regression and the underlying tests of significance compared to OLS and first difference OLS approaches.

The Yule-Walker autoregressive GLS regression method improves the t- statistics that test the confidence in, or significance of, the underlying coefficients. This approach also improves the R-squares when calculated correctly using the residuals for the original data and model specification. This is called the “Total R-square.”

The Durbin Watson statistics are close to 2.0. This means the method removes any inherent auto-correlation in the data. The GLS method estimates the coefficient that serially represents the relationship between residuals on day t and t-1. The SAS output shows the coefficient for the lagged first order residual is less than 1, and statistically significant.

I conclude, relying on the higher order results with very high statistical confidence, that:

- Commodity prices at the three Canadian hubs moved with the Henry Hub prices, which reflect broad market conditions in North America.
- I also find that the colder weather in 2013/14 caused greater commodity prices at Emerson and Iroquois.
- The days with high and unusual minimum IT bid floors had very statistically higher natural gas commodity prices.
- More than 90 percent of the variations in commodity prices were explained.

In order to remove any doubts about causality between minimum bid floors and commodity prices, I performed a similar analysis that used the previous day’s minimum IT bid floor to test its effect of the next day’s commodity price. I call this the Lag bid to distinguish it from the non-lag testing. This change accounts for the possible, but

unlikely, occurrence that the minimum IT bid floor on the same day may have been changed after that day's commodity prices were reported.

The so-called lagged results for the three selected locations are shown in Appendix B-2. The additional GLS results do not change much relative to the "same day" GLS analyses. In fact, they result in further confirmation that atypical minimum IT bid floors (i.e., more than 200% above a rolling 30-day average) provided to the market on the previous day affected local commodity price increases.

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