

CURRICULUM VITAE
DES EXPERTS DE GAZ MÉTRO

TÉMOINS

EN RÉFÉRENCE À LA PIÈCE

Bruce Henning, ICF International	Gaz Métro-2, Document 1, annexe 13
James M. Stephens, Sussex Economic Advisors	Gaz Métro-2, Document 16, annexe 1
Ruben Moreno, Concentric Energy Advisors	Gaz Métro-6, Document 1
Christian Dupuis, Extract recherche marketing	Gaz Métro-6, Document 2, annexe D

Bruce Henning
Vice President

ICF International

EDUCATION

B.S., Economics, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1978

PROFESSIONAL CREDENTIALS

Instructor, Gas Rate Fundamentals, University of Wisconsin, Madison, Wisconsin, 1995-1996

Instructor, Advanced Utility Ratemaking, University of Maryland, College Park, Maryland, 1995-1996

Instructor, Introduction to Utility Accounting, University of Richmond, Richmond, Virginia, 1996

Member, FERC Pipeline Competition Task Force, 1993

Member, NARUC Technical Advisors, Gas Integrated Resource Planning, 1993.

EXPERIENCE OVERVIEW

Bruce Henning has worked in the area of natural gas and energy economics for 32 years. Mr. Henning re-joined Energy and Environmental Analysis, Inc (EEA) in January of 1997. EEA was acquired by ICF International in January 2007. Mr. Henning provides clients with regulatory analysis, support and testimony, strategic and competitive analysis, gas supply planning, and natural gas pricing analysis and forecasting. Mr. Henning testified before the United States Senate Committee on Energy and Natural Resources on the relationship between gas and electric markets in California and the Senate Committee on Governmental Affairs on the impact of the Enron bankruptcy on electricity and gas markets. Mr. Henning's work is cited in FERC Order Nos. 637 and 637-a.

Project areas include analysis of short-term natural gas markets, analysis of LDC rate design alternatives, LDC gas supply planning and gas-electric interdependency. In addition, Mr. Henning conducted a study of the impacts of growing power generation demand for natural gas on gas industry infrastructure requirements and the impact of a single Northeast RTO in electricity markets. Mr. Henning developed a framework for applying Decision-based Cost Analysis for a Midwest LDC service and rates evaluation and has provided analysis of innovative rate design alternatives including price cap regulation, performance-based rates, and benchmarked rates.

Prior to returning to EEA, Mr. Henning served as the Chief Economist for the American Gas Association. In his 15 years at AGA, he was responsible for economic analysis of gas utility regulation and FERC pipeline regulation, short and long term energy and economic forecasts and modeling, and the statistics publications and analysis of AGA. He was a member of the FERC Pipeline Competition Task Force and the NARUC Technical Advisors Groups for Gas Integrated Resource Planning. He has served as an instructor for Gas Rates Fundamentals at the University of Wisconsin and Advanced Ratemaking for Gas Utilities at the University of Maryland. Mr. Henning received his B.S. in economics at the Massachusetts Institute of Technology, completing his thesis under Robert Solow, Nobel Laureate in Economics.

PROJECT EXPERIENCE

Gas-Electric Interdependency and Harmonization

White Paper prepared for NERC for inclusion in the 2013 Special Reliability Assessment: Accommodating an Increasing Dependence on Natural Gas for Electric Power 10 months. Mr. Henning was a principal author of the white paper prepared for the North American Reliability Corporation for the Phase II assessment. The white paper described the differences between the regulatory framework and operating practices of in the gas industry and electric industry. The white paper presented the analysis framework for including gas fuel supply reliability into electric reliability and resource adequacy assessment that was presented in the 2013 Special Reliability Assessment.

Analysis of methods to evaluate and interpret natural gas pipeline operational capacity data in the assessment of reliability of service to power generation and other gas shippers, four months. Working with natural gas pipeline representatives, Mr. Henning has evaluated the operational capacity data required by FERC for public disclosure to consider how this data should be collected, analyzed and interpreted in the context of the availability of gas pipeline service. The objective is to provide a statically valid data set for use in evaluating electric industry reliability and resource adequacy.

Gas Supply Planning

Analysis, review of proposals, and recommendation and regulatory support for the award of the primary gas purchase contract, two years. Mr. Henning directed the analysis for Centra Gas Ltd (LDC owned by Manitoba Hydro) in the review analysis and regulatory defense of the primary gas purchase contract for the utility. Factors considered included the changing dynamics of natural gas production and LNG deliveries as well as the interface of system gas purchases with the operation of the utility's customer choice program.

Natural Gas Storage Optimization, 18 months. Mr. Henning designed and directed the analysis of the optimal level of natural gas storage as a component to the overall natural gas portfolio for Michigan Consolidated Natural Gas, the natural gas utility owned by DTE Energy. Mr. Henning submitted direct and rebuttal testimony in the gas cost recovery proceeding defending the proposed approach to storage management.

Strategic Planning for Natural Gas Utilities

Mr. Henning provides clients with natural gas pricing analysis and forecasts. Working with EEA's modeling group, Mr. Henning incorporates forecast results into risk management and estimates the economic value of natural gas transmission, distribution, and storage assets.

Union Gas Limited, 11 Years. Mr. Henning has worked with Union Gas Limited, to evaluate the market value of new and existing gas transportation and storage assets. These analyses assess the risks to these assets due to weather and oil price uncertainty as well as the development of competing projects.

Mr. Henning was the principal author of "Restructuring Activity of Natural Gas Local Distribution Companies" published by GRI. The analysis compiled information regarding current restructuring activity, identified the key forces that will shape future restructuring trends, and developed scenarios describing the industrial organization of gas distribution services in future years. The analysis considered the functional requirements of LDC activities, the core competencies of LDCs, and the assets available to LDCs.

New York Gas Group. Mr. Henning authored a study of the liquidity gas market. In that study, Mr. Henning devised a quantitative metric to evaluate the relative market liquidity at different market centers that considers trading volume, price behavior, number of participants, and the physical characteristics of the market center.

Multi-Client Study: American Gas Association and Interstate Natural Gas Association of America. Mr. Henning's analysis of "Short-term Natural Gas Markets" was widely cited in FERC Order 637. The analysis was used by FERC to provide quantitative support for the removal of price caps in the short-term capacity release market.

Electricity Market Structure and Design, Mirant. In conjunction with Mr. E. Harry Vidas of EEA, Mr. Henning conducted an analysis of the efficiency benefits of a single Northeast Regional Transmission Organization (RTO). Mr. Henning and Mr. Vidas submitted testimony detailing this analysis to the FERC.

Mr. Henning has served as an expert witness in a civil litigation proceeding providing analysis of pipeline services, pipeline expansion, and natural gas markets. Mr. Henning has provided testimony before the Missouri Public Service Commission in gas supply incentive program proceedings and prudence reviews. Mr. Henning assisted an LDC client in the preparation of rate design testimony for the "green field" construction of a gas distribution system.

Gas Market Design

Design of Australian Natural Gas Short-term Trading Market (STTM), one year. As a senior member of the project team, Mr. Henning provided analysis and advice on the structure and design of proposed the STTM. The market was designed for initial implementation in South Australia and New South Wales, but allows for implementation throughout Eastern Australia. The design approach successfully incorporated the elements of the physical structure of the Australian natural gas industry, the business relationships between the entities, and current laws, regulations and contract terms. Mr. Henning was the principle liaison with the Board Level members of the Australian Gas Market Leaders Group.

Regulatory Analysis and Support

Economic Advisor, American Gas Association, 9 years. The national trade association of natural gas distribution companies currently retains Mr. Henning to provide economic analysis and market impact analysis. The work

focuses on the interaction between federal and state regulatory initiatives and is directly involved in the policy development of the LDC community.

Expert Witness, Union Gas Ltd. and Eastern Distributor Group, 5 years. Testimony before the National Energy Board of Canada and the Ontario Energy Board regarding natural gas markets and market structure, and market competition and market power.

Evaluation of fuel procurement hedging in terms of industry “Best Practices.” Mr. Henning has performed “best practices” analysis and review of the hedging practices for a large Florida utility with annual gas and oil purchases in excess of \$6 billion dollars. The report was submitted to the State regulatory authority and accepted as demonstrating prudence.

Natural Gas Hedging Strategy, Piedmont Natural Gas et.al. Mr. Henning has provided analysis of gas supply hedging programs including seminars for the North Carolina Public Service Commission, the Tennessee Regulatory Authority, and a session at the 2001 Annual Meeting of the National Association of Regulatory Utility Commissioners.

Congressional Testimony. In June 2001, Mr. Henning testified before the United States Senate Committee on Energy and Natural Resources on the interaction of natural gas and electricity markets in California. In January 2002, Mr. Henning testified before the United States Senate Committee on Governmental affairs on the impact of the Enron bankruptcy on natural gas and electricity markets. Mr. Henning has provided testimony before the Federal Energy Regulatory Commission on natural gas and electricity issues and before the Canadian National Energy Board on the structure of the gas market and market liquidity.

Investment Analysis and Due Diligence

Mr. Henning and the ICF Team have been engaged by firms to provide analysis of investment opportunities including the acquisition of natural gas transmission and storage facilities, contracting for capacity, commodity contracts and fuel supply plans and forecasts for electric generation. Mr. Henning is the lead analyst focusing on regulatory and market risk.

TESTIMONY

1. “Surrebuttal Testimony of Bruce B. Henning”, LaClede Gas Co., Case No. GT-2001-329 (dated March 2001). Mr. Henning submitted testimony on behalf of LaClede before the Missouri Public Service Commission. Mr. Henning’s testimony concerned the firm transportation discount component of LaClede Gas Company’s Gas Supply Incentive Plan.
2. “Statement of Bruce B. Henning Before the United States Senate Committee on Energy and Natural Resources” (dated June 19, 2001). Mr. Henning’s statement addressed the natural gas and electric markets in California and its relation to the North American gas and electricity markets.
3. “Affidavit of E. Harry Vidas and Bruce B. Henning”, Regional Transmission Organizations, Docket No. RT01-99-000, (dated October 8, 2001). Mr. Henning submitted comments on behalf of Mirant, et al. before FERC. Mr. Henning’s comments concerned the efficiency benefits of a single Northeast Regional Transmission Organization.
4. “Supplemental Affidavit of E. Harry Vidas and Bruce B. Henning”, Regional Transmission Organizations, Docket No. RT01-99-000, (dated October 26, 2001). Mr. Henning submitted comments on behalf of Mirant, et al. before FERC. Mr. Henning’s comments concerned the efficiency benefits of a single Northeast Regional Transmission Organization.
5. “Statement of Bruce B. Henning: Before the United States Senate Committee on Governmental Affairs” (dated January 24, 2002). Mr. Henning’s statement addressed the impact of the Enron bankruptcy on natural gas and electricity markets.
6. “Written Evidence of Bruce B. Henning and Michael D. Sloan”, TransCanada PipeLines Limited, Hearing Order RH-1-2002 (dated May 2002). Mr. Henning submitted written evidence before the National Energy Board on behalf of Enbridge Gas Distribution Inc., Societe En Commandite Gaz Metro, and Union Gas

Limited. Mr. Henning's written evidence concerned the proposed establishment of the Southwest Z and its impact on market liquidity.

7. "Rebuttal Testimony of Bruce B. Henning", Aquila, Inc. d/b/a Aquila Networks, Case Nos. GR-2000 and GR-2001-461 (dated November 2002). Mr. Henning submitted testimony on behalf of Aquila Networks before the Missouri Public Service Commission ("MPSC"). Mr. Henning's testimony addressed the Actual Cost Adjustment for Aquila Networks.
8. "Rebuttal Testimony of Bruce B. Henning on Behalf of Atmos Energy Corporation", In the Matter of Atmos Energy Corporation's Purchased Gas Adjustment Factors to be Reviewed in Its 2000-2001 Actual Cost Adjustment, Case Nos. GR-2001-396 and GR-2001-397 (dated February 28, 2003). Mr. Henning submitted testimony on behalf of Atmos Energy Corporation before the MPSC. Mr. Henning's testimony addressed the Actual Cost Adjustment for Atmos Energy Corporation.
9. "Analysis of FERC Staff Report Investigating California Natural Gas and Electricity Prices", San Diego Gas & Electric Co., Docket Nos. EL00-95-045 and EL00-98-42, prepared by Bruce B. Henning and Michael Sloan, (dated October 15, 2002). Mr. Henning submitted a report on behalf of Energy and Environmental Analysis, Inc. ("EEA") before the Federal Energy Regulatory Commission ("FERC"). Mr. Henning's report concerned issues related to FERC's investigation of natural gas and electricity prices.
10. "Written Evidence of Bruce B. Henning and Michael D. Sloan on Behalf of Union Gas Limited", Hearing Order RP-2000-0005 (dated October 29, 2003). Mr. Henning submitted written evidence on behalf of Union Gas Limited before the Ontario Energy Board. Mr. Henning's written evidence addressed issues related to the compensation of landowners for the use of natural gas storage pools located on their property.
11. "Written Evidence of Bruce B. Henning and Michael D. Sloan", TransCanada PipeLines Limited, Hearing Order RH-3-2004 (dated June 21, 2004). Mr. Henning submitted written evidence before the National Energy Board on behalf of Enbridge Gas Distribution Inc., Societe En Commandite Gaz Metro, and Union Gas Limited. Mr. Henning's written evidence concerned the impact of the proposed North Bay Junction on Eastern Canadian Natural Gas Markets.
12. "Statement of Bruce B. Henning on Behalf of American Gas Association", Price Discovery in Natural Gas and Electric Markets, Docket Nos. PL03-3-005, et al. (dated June 25, 2004). Mr. Henning submitted a statement on behalf of American Gas Association ("AGA") before FERC. Mr. Henning's comments concerned the AGA's response to a FERC Staff report on price indices used in pipeline tariffs.
13. "In Response to the Notice of Inquiry on FERC Policy Regarding Selective Discounting", Notice of Inquiry Policy for Selective Discounting by Natural Gas Pipelines, Docket Nos. RM05-2-000 and RM07-7-000 submitted by Bruce B. Henning, (dated March 31, 2005). Mr. Henning submitted comments on behalf of INGAA before FERC. Mr. Henning's comments concerned FERC's selective discounting policy.
14. "Expert Report of Bruce B. Henning", California Department of Water Resources v. Sempra Energy Resources, AAA Case No. 74 198 Y 00193 04 VSS (dated May 25, 2005). Mr. Henning submitted a report on behalf of Hennigan, Bennet and Dorman LLP before the American Arbitration Association. Mr. Henning's report concerned his review of an energy purchase agreement between the California Department of Water Resources and Sempra Energy Resources.
15. "Rebuttal Expert Report of Bruce B. Henning", California Department of Water Resources v. Sempra Energy Resources, AAA Case No. 74 198 Y 00193 04 VSS (dated July 19, 2005). Mr. Henning submitted a report on behalf of Hennigan, Bennet and Dorman LLP before the American Arbitration Association. Mr. Henning's report concerned his review of an energy purchase agreement between the California Department of Water Resources and Sempra Energy Resources.
16. "Report: The Impact of Rabaska LNG Imports on Quebec and Ontario Natural Gas Markets", authored by Bruce B. Henning and Michael Sloan (dated November 2005). Mr. Henning submitted a report on behalf of Rabaska Limited Partnership before the Canadian Environmental Assessment Agency. Mr. Henning's report concerned a market study to assess the impacts of imports into Québec on the Ontario and Quebec natural gas markets. "Presentation of Bruce B. Henning: Determinants of Natural Gas Commodity Prices in the Alabama Gas Market", Docket U-4708 (dated January 31, 2006). Mr. Henning made a presentation to the Alabama Public Service Commission regarding the factors influencing gas markets in Alabama gas service territories.

17. “Prepared Direct Testimony of Bruce. B. Henning on Behalf of Marathon Oil Company”, Docket U-06-02, (dated March 10, 2006). Mr. Henning submitted testimony on behalf of Marathon Oil Company to the Regulatory Commission of Alaska supporting the approval of a gas supply contract between Alaska Pipeline Company and Marathon Oil Company.
18. “Prepared Direct Testimony of Bruce. B. Henning on Behalf of PPM Energy”, Docket RP-06-407-000, (dated June 14, 2007). Mr. Henning submitted testimony on behalf of PPM Energy to the Federal Energy Regulatory Commission on the Policy and Economic Efficiency issues associated with “Rolled-in” rate treatment of facilities expansion costs.
19. “Prepared Cross-Answering Testimony of Bruce. B. Henning on Behalf of PPM Energy”, Docket RP-06-407-000, (dated August 7, 2007). Mr. Henning submitted testimony on behalf of PPM Energy to the Federal Energy Regulatory Commission on the Policy and Economic Efficiency issues associated with “Rolled-in” rate treatment of facilities expansion costs.
20. “Prepared Direct Testimony of Bruce. B. Henning on Michigan Consolidated Natural Gas ”, Docket U-15451, (dated December 28, 2007) Mr. Henning submitted testimony and Exhibits presenting an analysis of optimal storage utilization.
21. Initial Expert Report of Mr. Bruce B. Henning In the matter of Howell Petroleum Corp. v. Williston Basin Interstate Pipeline Co. v. Anadarko Petroleum Corp. (Civil Action 24024, District Court, Fifth Judicial District, Park County, Wyoming) Mr. Henning submitted a report quantifying damages from the unauthorized removal of natural gas from a natural gas storage facilities totaling more than \$100 million dollars.
22. “Meeting Natural Gas Requirements in Ontario, Canada, and the United States: Supply Source Forecast to 2030”, Docket EB-2007-0707 (dated July 30, 2008) Mr. Henning submitted exhibits examining natural gas supply, flow patterns and infrastructure adequacy to meet North American gas requirements.
23. “Evidence of Bruce B. Henning”, TransCanada Pipeline 2012-2013 Toll Application, Hearing Order RH-003-2011, March 9, 2012 before the National Energy Board. Mr. Henning submitted evidence regarding TCPL’s Business and Services Restructuring Proposal and Mainline Final Tolls 2012-2013 and the impact on gas markets in Canada.
24. “Reply Evidence of Bruce B. Henning,” Nova Scotia Power, Fuel Adjustment Mechanism Audit, Docket P-893, Nova Scotia Utility and Review Board, August 27, 2012. Mr. Henning submitted evidence regarding the structure and performance of natural gas markets in the Canadian Maritimes Provinces and the Northeast United States.

PUBLICATIONS

1. Pipeline and Storage Infrastructure Requirements for a 30 Tcf U.S. Gas Market, INGAA Foundation, May 1999.
2. Natural Gas Storage Overview in a Changing Market Environment, Gas Research Institute, November 1999.
3. Multi-Client Study of Pipeline Capacity Contracts Held by Affiliated and Non-Affiliated Pipeline Customers and Managed by Assets Managers and Agents, Pipeline Data Report, Energy and Environmental Analysis, Inc. January 2001.
4. Restructuring Activities of Natural Gas Local Distribution Companies, GRI Baseline Center, Gas Research Institute, June 2000.
5. Supplying Natural Gas for Peaking in a 30+ Tcf Market, (Contributing Author), National Energy Technology Laboratory, U.S. Department of Energy, May 2002.
6. Analysis of Natural Gas Market Liquidity at Points Affecting New York LDC’s, New York Gas Group, February 2003.
7. Natural Gas and Energy Price Volatility, prepared for Oak Ridge National Laboratory, October 2003.
8. An Updated Assessment of Pipeline and Storage Infrastructure for the North American Gas Market; verse Consequences of Delays in the Construction of Natural Gas Infrastructure, INGAA Foundation, July 2004.

9. Discussion of Effects of Long-term Gas Commodity and Transportation Contracts on the Development of North American Natural Gas Infrastructure, INGAA Foundation, August 2005.
10. Can Regulators Do Anything about High Natural Gas Prices? Recommended Actions to Help Reduce Consumer Costs and Gas Price Volatility, INGAA Foundation, January 2007.
11. Assessment of Natural Gas Commodity Options for Centra Manitoba, Centra Manitoba, January 2007.
12. Storage Planning and Optimization for MichCon GCR Customers, DTE Energy, December 2007.
13. A Proposed Design for the Natural Gas Short Term Trading Market for Australia, Gas Market Leaders Group, January 2008.
14. Understanding Natural Gas Storage: What Creates Value for the Public and Gas Market Participants?, California Energy Commission, Public Interest Research Program, June 2008.
15. Long-term Contracting for Natural Gas: Examination of the Issues that Affect the Potential for the Increased Use of Contracting to Stabilize Consumer Prices, ICF, June 2011.
16. The Economy and Shale Play Pivotal Role in Price Outlook, Kevin R. Petak and Bruce B. Henning, The American Oil and Gas Reporter, December 2009.
17. Partners in Reliability: Gas and Electricity, Bruce Henning and Judah Rose, Power Magazine, September 1, 2012

EMPLOYMENT HISTORY

EEA, an ICF International Company	Vice President	1997–present
American Gas Association	Chief Economist	1991-1997
American Gas Association	Associate Director, Economic Analysis	1987-1991
American Gas Association	Manager, Economic Analysis	1985-1987
American Gas Association	Manager, TERA User Services	1981-1985
Energy and Environmental Analysis, Inc	Economic Professional	1978-1981

**James M. Stephens
Partner
Sussex Economic Advisors, LLC**

Mr. Stephens has twenty-five years of experience in the energy industry and he has held senior management positions at consulting firms, energy marketing companies and local distribution companies. He has assisted numerous clients with regulatory policy strategy/tactics and energy market analyses/assessments including: the analysis of regional energy market dynamics and the associated drivers for new natural gas infrastructure; the evaluation of new markets/opportunities; market entry/exit strategies; market implications of new energy infrastructure; integrated resource plans; natural gas supply portfolio evaluation and optimization; and management prudence. In addition to his consulting experience, Mr. Stephens served as the President of a retail energy marketing firm where he was responsible for all aspects of business unit management including front, mid and back office functions. Mr. Stephens was also responsible for Gas Supply Procurement and Portfolio Optimization for Colonial Gas Company, a National Grid subsidiary. Mr. Stephens holds a B.S. in Management and an M.B.A. with a concentration in Operations Management from Bentley College.

REPRESENTATIVE PROJECT EXPERIENCE

Energy Market Assessment

Develop regional energy market assessments throughout the U.S. and Canada. Such assessments have included development of electric and natural gas price forecasts, evaluation of market impacts associated with new infrastructure, analysis of power generation project entry and exit scenarios, assessment of natural gas transmission infrastructure, market structure and regulatory analysis, and assessment of competitive position. Market assessment engagements typically have been used as integral elements of business unit or asset-specific strategic plans or valuation analyses. In addition, certain market assessments have been submitted to the Federal Energy Regulatory Commission, National Energy Board of Canada and various state and provincial regulatory commissions.

Representative engagements have included:

- On behalf of Spectra Corporation, developed a market assessment evaluating the impact of new pipeline infrastructure into the New York City, New Jersey and New England markets. The independent reports were filed at the Federal Energy Regulatory Commission and/or presented to state public utility commissions.
- For an international energy company, prepared an assessment of the market potential for distributed LNG, with a particular focus on the commercial and industrial sectors. The results of the analysis were presented to senior management.
- For a project developer, prepared a demand analysis of the current and projected natural gas market for the Southeast U.S. The independent report, which was filed at FERC, addressed the demand for natural gas in both the electric generation and traditional LDC markets.
- For an international energy company, prepared an analysis regarding LNG facility investment with a particular focus on LNG peaking facilities.
- Conducted due diligence for commercial banks regarding investments in natural gas pipelines, natural gas storage projects and LNG facilities.
- For a project developer, assisted with the evaluation of the market opportunity for an importation LNG terminal in the northeastern United States.
- For numerous clients, provided regional natural gas demand assessments to support energy infrastructure investment. The results of these studies have been submitted and supported in various jurisdictions, including the FERC and the NEB.
- For a natural gas producer, reviewed energy contract practices and pricing mechanisms to support a contract arbitration process.

- For an international natural gas distribution company, reviewed potential strategies associated with the optimization of natural gas storage withdrawals and injections.

Business Strategy and Operations

Retained by energy companies to provide services relating to the development of strategic plans and planning processes for both regulated and non-regulated entities. Specific services provided include: developing market entry strategies for retail and wholesale businesses; review of management practices and procedures; and business process redesign initiatives.

Representative engagements have included:

- Reviewed the investment potential of a greenfield LDC on behalf of a regional energy distributor
- Reviewed the natural gas supply alternatives (i.e., supply basin cost, transport basis and regulatory issues) for an integrated energy company
- Developed regional market assessments and associated market entry strategies for a wholesale energy marketing company
- Reviewed certain management practices and procedures for a wholesale energy marketing company;
- Performed due diligence on a retail electricity marketing firm in support of a third party investment;
- Prepared a competitive position analysis (i.e., SWOT analysis) for an interstate gas pipeline
- On behalf of a wholesale energy marketing company, reviewed federal and state requirements associated with entering certain natural gas markets
- Assessed the economic viability of gas distribution utility service expansion in Vermont
- Developed new service offerings, including firm transportation and stand-by service, for a mid-Atlantic utility
- Managed the re-engineering of a large Midwest LDC's gas supply procurement process
- Managed the re-engineering of a mid-Atlantic wholesale energy marketing company's gas operations
- On behalf of an interstate pipeline, conducted a customer outreach/survey program

Regulatory Analysis and Support

Provided services relating to the development of regulatory and ratemaking strategies, energy supply obligations, stranded cost assessment and recovery, rate design, and management prudence. Specific services provided include: assistance with open season process and procedures, FERC standard of conduct review, analysis of provider of last resort obligations in both electric and gas markets, develop new service offerings, and provide litigation support.

Representative engagements have included:

- Retained by Union Gas to conduct an independent review of the company's gas supply plan as well as its gas supply planning process and methodology
- Retained by Union Gas to perform a statistically based analysis of the various methodologies, which may be employed to determine the weather normal for a given year
- Assisted the Massachusetts Department of Energy Resources in evaluating the benefits, cost and challenges associated with natural gas expansion by local distribution companies
- Retained by a state agency to review the rate design associated with a potential natural gas pipeline project
- Retained by numerous LDCs to assist with natural gas demand forecasting
- Retained by an LDC to develop regulatory strategy associated with the funding of distribution expansion
- Retained by a Midwest U.S. interstate gas pipeline to assist with an open season including drafting of tariffs and precedent agreements, and interaction with potential shippers
- Retained by a Northeast energy company to review the FERC reporting requirements and standards of conduct for an interstate pipeline business unit

- Provided regulatory and litigation support to a natural gas pipeline regarding rate impacts of new infrastructure development
- Provided litigation support to a mid-west utility regarding proposed gas purchase disallowances for storage utilization, hedging activity, and pipeline capacity decisions
- On behalf of a Midwest utility, developed and implemented a third party transportation program
- Assisted several LDCs evaluate and implement regulatory strategy regarding declining use per customer
- Developed demand study to support the AES Sparrows Point LNG FERC application
- On behalf of Emera Brunswick Pipeline, assisted with the development of the demand and supply study submitted as part of the application to the National Energy Board of Canada
- Provided support to a Canadian LNG supplier regarding their NEB export license application

Energy Procurement

Directed and participated in the review of various energy procurement projects including demand modeling, portfolio review/optimization, procurement strategies and associated cost structures.

Representative engagements/experience has included:

- Retained by a natural gas utility to review the value achieved under an asset management agreement
- Provided a private company with a review of natural gas supply options and associated prices and risks
- On behalf of a large natural gas distribution company, evaluated the benefit associated with asset management opportunities
- On behalf of a regional combination utility, reviewed the appropriate jurisdiction for a natural gas pipeline asset
- On behalf of a natural gas utility, conducted a detailed audit of the gas supply, marketing, and accounting functions
- On behalf of several gas utilities, developed demand forecasts and supported those forecasts in regulatory proceedings
- For a multi-state utility, reviewed the demand forecast planning process and procedures and recommended certain process changes
- On behalf of a financial institution, reviewed the competitiveness of a storage project investment and quantified the impact of various new projects on the storage project financial performance

Financial and Economic Advisory Services

Involved in the sale or evaluation of several non-regulated energy companies including wholesale and retail energy marketing companies, on-line energy brokers and energy services' companies. Assisted clients with market strategy and the identification of partnership opportunities. Specific services provided include: business unit evaluation, development of sale materials, marketing of transaction, bid evaluation and negotiation support. These engagements have resulted in completed sales or strategy changes.

Representative engagements have included:

- Assisted a private company with business/market communication material and the identification of potential partners to support the commercialization of the client's patented intellectual property
- Performed an independent review of a retail energy marketer to value a third party investment
- Sale of Niagara Mohawk Power Corporation's non-regulated energy marketing affiliate
- Sale of Providence Energy Corporation's non-regulated marketing affiliate
- Performed an independent valuation of an on-line energy broker on behalf of an investor

PROFESSIONAL HISTORY

Sussex Economic Advisors, LLC (2012 – Present)

Partner

Concentric Energy Advisors, Inc. (2002 – 2012)

Executive Advisor
Senior Vice President
Vice President

Navigant Consulting, Inc. (2000 – 2001)

Director, Energy Market Assessment Practice Area

Providence Energy Services (1997 – 2000)

President (1998 – 2000)
President, Providence-Southern (1997 – 1998)

REED Consulting Group (1994 – 1997)

Assistant Vice President

Colonial Gas Company (1991 – 1994)

Director, Gas Supply Planning and Acquisition (1993 – 1994)
Manager, Gas Supply (1991 – 1993)

Boston Gas Company (1987 – 1991)

Senior Gas Supply Analyst (1990 – 1991)
Transportation and Exchange Analyst (1988 – 1990)
Business Analyst (1987 – 1988)

EDUCATION

M.B.A., Bentley College, 1991

B.S., Bentley College, 1987

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Member of the Northeast Gas Association
Member of the Gas Guild of Managers
Member of the Society of Gas Lighters
Member of the Northeast Energy and Commerce Association

TECHNICAL ANALYSIS OF RUBEN MORENO

1 ***IX. APPENDIX A – RESUME***

2 Ruben Moreno has been helping large consumers or producers of energy optimize expenditures,
3 revenues and investments for the past 19+ years in the US, Canada and South America. He is a
4 specialist in environmental security, risk management, quantitative methods and statistical
5 analysis. He has advised on the exposures of a US\$10 billion portfolio and also has broad
6 experience in management consulting and teaching. His experience includes a broad range of
7 fuels (oil, natural gas, coal, wind, solar and hydro), differing generating technologies and
8 extensive transactional experience supporting clients design and implement energy procurement
9 practices to identify how much to purchase, when and why.

10

11 **Representative Project Experience**

12

13 Expert Witness

14 • Evaluated Nova Scotia Power Inc. (NSPI) hedging strategy and provided expert witness
15 testimony on behalf of NSPI before the Nova Scotia Utility and Review Board
16 (NSUARB) under Docket M04972). An audit conducted on behalf of the NSUARB
17 recommended the deferral of \$12.8 million due to NSPI's alleged failure to hedge
18 Northeast Market basis during the Winter 2010-2011. On December 21, 2012, the
19 NSUARB published its decision on the case (2012 NSUARB 227) ruling that NSPI was
20 able to recover the full \$12.8 million.

21 • Evaluated Guam Power Authority's (GPA)'s energy risk management program in light of
22 unfavorable financial hedge settlements of \$64 million. Wrote report and presented a
23 defense before Guam's Public Utility Commission and its consultant.

24

25 Asset Valuation

26 • Designed, valued, supervised and implemented market transactions for more than 40 GW
27 of generation/load and the associated fuels;

TECHNICAL ANALYSIS OF RUBEN MORENO

- 1 • Created a risk-based analytical framework to evaluate the value of a power plant and
2 negotiated the value on behalf of the customer. Final result avoided 40% increase in the
3 cost of operating the plant;
- 4 • Audited the risk management function of Powerex (wholesale energy trader in Canada)
5 on behalf of its (regulated) owner BC Hydro. Involved the evaluation of VaR calculation
6 and portfolio aggregation;
- 7 • Asset Valuation and Risk Management Strategy to enhance/protect the value of a power-
8 generating asset in bankruptcy from the perspective of the holder of a long-term energy
9 contract;
- 10 • Risk Profiling of Operational Risk Exposures for Industrials and Power Producers in
11 Mexico, Canada, Europe and the U.S.; and
- 12 • Designed and implemented risk management and value-extraction derivative structures to
13 meet corporate objectives within a manageable (i.e. acceptable) risk profile. Market Risk
14 Management

15

16 Market Risk Management

- 17 • Designed, valued, supervised and implemented market transactions for more than 40 GW
18 of generation/load and the associated fuels;
- 19 • Created a risk-based analytical framework to evaluate the value of a power plant and
20 negotiated the value on behalf of the customer. Final result avoided 40% increase in the
21 cost of operating the plant;
- 22 • Audited the risk management function of Powerex (wholesale energy trader in Canada)
23 on behalf of its (regulated) owner BC Hydro. Involved the evaluation of VaR calculation
24 and portfolio aggregation;
- 25 • Asset Valuation and Risk Management Strategy to enhance/protect the value of a power-
26 generating asset in bankruptcy from the perspective of the holder of a long-term energy
27 contract;
- 28 • Risk Profiling of Operational Risk Exposures for Industrials and Power Producers in
29 Mexico, Canada, Europe and the U.S.; and

TECHNICAL ANALYSIS OF RUBEN MORENO

- 1 • Designed and implemented risk management and value-extraction derivative structures to
2 meet corporate objectives within a manageable (i.e. acceptable) risk profile.

3

4 Compliance to Accounting Standards

- 5 • Designed, implemented and audited compliance to standards for regulated and
6 unregulated energy companies;
- 7 • Conceptualized, systematized and implemented ad-hoc comprehensive risk management
8 metrics for government clients in pursuit of compliance to constituent's expectations;
- 9 • Commercial assistance to customers to interpret and implement the newly adopted
10 Federal Accounting Standard to determine Fair Value of derivative products (FAS-157);
- 11 • Commercial assistance to support hedge efficiency standards under the Federal
12 Accounting Standards for the registry of derivative products (FAS-133(7)); and
- 13 • Audited entire risk management and compliance functions for regulated utilities.

14

15 Operational Risk Management

- 16 • Designed, implemented and audited policies, procedures and programs to avert non-
17 compliance to standards or business goals;
- 18 • Created essential risk reporting position report to inform client on the risk exposure and
19 its management;
- 20 • Trained 20+ project managers on risk management principals and how to apply them to
21 project management and budget protection;
- 22 • Risk Management Strategy (structuring and implementation) to protect the Cost of
23 Service expectation (i.e. Budget) for Energy for a \$623m portfolio;
- 24 • Lead expert and project manager in risk quantification, measurement and integration or a
25 risk management function and compliance function on behalf of consulting companies
26 (R.W. Beck, SAIC and Pace Global) and regulated utilities (e.g. NYPA, LIPA, Santee
27 Cooper, CDWR);
- 28 • Responsible for risk management practice that supports a \$10 billion portfolio of
29 different projects;

TECHNICAL ANALYSIS OF RUBEN MORENO

- 1 • Created and managed a business practice that has allowed my staff to achieve above
2 average salary growth rates YOY;
- 3 • Supervised eight analytical staff and help them translate quantitative work into products
4 that are sellable and valuable to the client; and
- 5 • Created, managed and presented weekly publication distributed to large industrials and
6 power producer on Operational Risks affecting the Energy industry.

7

8 Enterprise Risk Management

- 9 • Designed, implemented and audited enterprise risk management functions and insurance
10 structures;
- 11 • Designed and implemented the enterprise risk management for a large generation and
12 transmission company in the Colorado Area. The assignment included creating a
13 framework for understanding and measuring the risk, identifying a plan forward on how
14 to implemented and the design of a set of executive-level reporting structure;
- 15 • Evaluated the aggregate risk exposure for a large transmission, distribution and
16 generation company in South California and identified all aspects that may generate a
17 legal implication; and
- 18 • Evaluated the insurance adequacy associated with operational and market exposure. The
19 analysis evaluated a tiered approach to the acquisition of insurance and a comparison
20 with cost of money to determine self-insurance levels.

21

22 Transactional Experience

- 23 • Designed and implemented market-specific transactions;
- 24 • Assisted a purchaser of debt from distressed assets with an option for converting to equity
25 (debtquity). The analysis identified generic market areas and identified opportunities to
26 purchased distressed debt assets;
- 27 • Advised customer on \$75M pre-payment of natural gas and heating oil contracts and
28 participation to softer energy prices on behalf of customer;
- 29 • Assisted energy producers and buyers to structure, formulate, bid, qualify and negotiate
30 energy structures to satisfy a business requirement within a risk management context; and

TECHNICAL ANALYSIS OF RUBEN MORENO

- 1 • Evaluation and enhancement of the risk management function of a major utility in the
2 Northeast from the point of view of the takers of 25% of the total output.
3

4 Statistics and Load Growth

- 5 • Expert-level statistic practitioner with the ability to translate the impact of energy load
6 growth and energy-specific risks to the demographics.
7 • Assisted multiple clients to statistically characterize their growth in energy use, design
8 strategies to supply that growth typically in a long-term scenario (30-year strategic
9 energy plans).
10 • Technical expert in productivity measurement and cross-industry comparisons.
11 • Assisted the City of Quincy Florida to understand the behavioral impact in the
12 deployment of smart grid technology and how to best implement in the context of very
13 specific demographic constraints.
14

15 Finance and Budget Analysis

- 16 • Technical expert in finance at the operational, academic and strategic level.
17 • Asset Valuation and Risk Management Strategy to enhance/protect the value of a power-
18 generating asset in bankruptcy from the perspective of the holder of a long-term energy
19 contract.
20 • Commercial assistance to support hedge efficiency standards under the Federal.
21 • Overall financial and creditworthiness analysis of firms to determine financial capability
22 to undertake design-build infrastructure projects.
23

24 Environmental Security

- 25 • Subject Matter Expert supporting the U.S. Southern Command (“USSOUTHCOM”) Science,
26 Technology and Experimentation Directorate (“J7”) to capitulate and transition
27 services for implementation. The end result is a database with relevant documents, a
28 final report describing how the DoD can positively affect environmental security;
29 • Project Manager to Create the Energy Assurance Plan for the Virginia Department of
30 Mines, Minerals and Energy. This includes conducting an inventory and providing a

TECHNICAL ANALYSIS OF RUBEN MORENO

1 vulnerability and risk assessment of energy infrastructure and distribution systems;
2 revising the energy assurance plan; and conducting exercises that will educate public and
3 private officials and test their knowledge of the revised energy assurance plan; and

- 4 • Subject Matter Expert on Risk and Vulnerability Assessment for Massachusetts, New
5 York, Oregon, Missouri, Salt Lake City and Columbia MO.

6 7 Renewable Resources

- 8 • Designed and implemented the procurement of 38 million gallons of ultra-low sulfur
9 diesel in the New York area. The process incorporated a staged approach to low-sulfur
10 compliance and the mandate for a dedicated fleet transporting the fuel;
- 11 • Evaluated the pricing and procurement of white-tags in the context of environmental
12 compliance;
- 13 • Designed and currently implementing a consulting approach to services associated with
14 managing a CO2 account. The approach incorporates a quantitative rigor similar to
15 traditional financial metrics;
- 16 • Assisted a large Spanish company looking to purchase between 500 and 1,000 MWs of
17 renewable energy in the U.S. over the next five years; and
- 18 • Recently developed an approach to estimate the extrinsic value of a compressed-air
19 energy storage facility either as a stand-alone unit or as it integrates with other resources.

20 21 County, State and Federal Government/Military

- 22 • Subject matter expert in how the confluence of energy, food, water, health and climate
23 change affect security.
- 24 • Hosted and led a team to evaluate the investment of an aluminum smelter and associated
25 power generation in Bolivia to take advantage of the natural gas reserved in the area. The
26 project included the preliminary feasibility for the aluminum smelter, setting up a series
27 of visits to Bolivia, and a final assessment of the investment to include factors such as
28 infrastructure, political stability, investment climate and poverty impact.
- 29 • Project Manager to Create the Energy Assurance Plan for the Virginia Department of
30 Mines, Minerals and Energy. This includes conducting an inventory and providing a

TECHNICAL ANALYSIS OF RUBEN MORENO

1 vulnerability and risk assessment of energy infrastructure and distribution systems;
2 revising the energy assurance plan; and conducting exercises that will educate public and
3 private officials and test their knowledge of the revised energy assurance plan.

- 4 • Subject Matter Expert on Risk and Vulnerability Assessment for Massachusetts, New
5 York, Oregon, Missouri, Salt Lake City and Columbia MO.

7 Professional History

- 9 • **Concentric Energy Advisors, Inc. (2012 – Present)**
10 • Assistant Vice President
11
- 12 • **R.W. Beck (an SAIC Company) (2007 – 2011)**
13 • Senior Director, Risk Management
14
- 15 • **Science Applications International Corporation (2006 – 2007)**
16 • Director, Risk Management
17
- 18 • **Pace Global Energy Risk Management, LLC (1998 – 2005)**
19 • Executive Director, Risk Management
20
- 21 • **Center for Strategic Studies, ITESM (1991 – 1995, 1997 – 1998)**
22 • Consultant/Researcher
23
- 24 • **Department of Economics, ITESM (1992 – 1998)**
25 • Associated Professor
26
- 27 • **Equifax de Mexico, S.I.C.S.A (1996 – 1997)**
28 • Financial Manager
29

30 Education

TECHNICAL ANALYSIS OF RUBEN MORENO

- 1
- 2 • Leadership Acceleration Program, University of Notre Dame, July 2004
- 3 • MS, Economics, University of Texas, 1995
- 4 • MBA, Finance, ITESM (Mexico), 1992
- 5 • BA, ITESM (Mexico), 1990
- 6 • Technician – Accounting, ITM (Mexico), 1986
- 7
- 8 **Other**
- 9
- 10 • Languages: English, Spanish (native speaker) and conversational German (mittelstufe)
- 11 • Security: Top Secret security clearance granted in December 2011.
- 12

CHRISTIAN DUPUIS

Nom de la firme : EXTRACT RECHERCHE MARKETING **Nb. d'années avec firme :** 10
Nom de la ressource : DUPUIS, Christian **Nb. d'années d'expérience :** 20
Profession : Associé
Date de naissance : 17 novembre 1969
Nationalité : Canadienne

SOMMAIRE PROFESSIONNEL :

Après avoir complété une maîtrise marketing à l'Université de Sherbrooke en 1994, Christian Dupuis a agi à titre de consultant en recherche marketing chez Léger Marketing (anciennement Groupe Léger & Léger).

En 1999, il joint l'équipe du marketing de Gaz Métro à titre de chef du service, recherche et stratégies marketing pour une période de 4 années. Ses responsabilités étaient de gérer la recherche commerciale, le développement et la mise en œuvre des stratégies marketing de Gaz Métro auprès des marchés résidentiel, commercial, industriel et institutionnel. Il était responsable du développement et de la mise en œuvre du Plan global en efficacité énergétique de Gaz Métro de 1999 à 2003. Il a ainsi été à l'origine de nombreux programmes de sensibilisation et d'économie d'énergie.

En 2003, il fonde Extract recherche marketing avec Alexandre Meunier et offre une gamme complète de services en génération, traitement et intégration d'informations marketing avec une spécialisation en énergie. Christian Dupuis a dirigé et réalisé plus de 1 100 études de marché au cours de sa carrière.

Enfin, en 2009, Christian Dupuis fonde Dialog, un centre d'appels spécialisé en sondage et service clientèle dans le secteur de l'énergie.

FORMATION UNIVERSITAIRE :

1994 **Maîtrise en administration des affaires (M.Sc.)**
Université de Sherbrooke, Québec, Canada

1993 **Baccalauréat en sciences de la consommation (B.A.)**
Université Laval, Québec, Canada

LANGUES :

	<i>Parlée</i>	<i>Lue</i>	<i>Écrite</i>
Français	Excellent	Excellent	Excellent
Anglais	Bon	Très bon	Bon

CHEMINEMENT PROFESSIONNEL :

Depuis 2003 **Extract recherche marketing**

Associé

- Direction d'entreprise
- Gestion d'une équipe de 12 professionnels
- Direction des projets de recherche marketing dans le secteur de l'énergie

Depuis 2009 **Dialog (centre d'appels)**

Associé

- Direction d'entreprise
- Gestion d'une équipe de 60 employés

1999 - 2003 **Gaz Métro**

Chef de service, recherche et stratégies marketing

- Gestion du Service de recherche et stratégies marketing (équipe de 10 spécialistes en marketing)
- Production et exécution du plan marketing annuel (stratégies commerciales d'entreprise, programmes de promotion saisonnière, analyse de rentabilité)
- Développement et mise en œuvre d'une approche de gestion de la relation clientèle (*Customer Relationship Management*)
- Gestion du plan d'efficacité énergétique de l'entreprise
- Porte-parole des chroniques télévisées de Gaz Métro
- Conférencier

1994 - 1999 **Léger Marketing**

Conseiller, analyste puis chargé de recherche

- Développement des ventes
 - Réalisation des projets d'étude de marché
 - Direction d'équipe projet
-

SOMMAIRE DE L'EXPERIENCE PERTINENTE :

Depuis 2003, Christian Dupuis a dirigé plus de 125 projets d'études spécialisées dans le marché de l'énergie principalement pour le compte du Bureau de l'efficacité et l'innovation énergétiques, Gaz Métro et Hydro-Québec.
