

**STATE OF CONNECTICUT**  
**DEPARTMENT OF PUBLIC UTILITY CONTROL**

DPUC General Rate Review of	)	
Connecticut Natural Gas Corporation	)	Docket No. 06-03-04PH01
Pursuant to Conn. Gen. Stat.	)	
Section 16-19 – Revenue Requirements	)	

**DIRECT TESTIMONY OF**

**J. RICHARD HORNBY**

**ON BEHALF OF**

**STATE OF CONNECTICUT**  
**OFFICE OF CONSUMER COUNSEL**

November 21, 2006

1 **Q. Please state your name, position and business address.**

2 A. My name is J. Richard Hornby. I am a Senior Consultant at Synapse Energy  
3 Economics, Inc, 22 Pearl Street, Cambridge, MA 02139.

4 **Q. On whose behalf are you testifying in this case?**

5 A. I am testifying on behalf of the Connecticut Office of Consumer Counsel  
6 (“OCC”).

7 **Q. Please describe Synapse Energy Economics.**

8 A. Synapse Energy Economics ("Synapse") is a research and consulting firm  
9 specializing in energy and environmental issues.

10 **Q. Please summarize your work experience and educational background.**

11 A. I am a consultant specializing in planning, market structure, ratemaking and gas  
12 supply/fuel procurement in the electric and gas industries. Over the past twenty  
13 years I have presented expert testimony and provided litigation support on these  
14 issues in approximately 100 proceedings in over thirty jurisdictions in the United  
15 States and Canada. Over this period my clients have included staff of public  
16 utility commissions, state energy offices, consumer advocate offices and  
17 marketers. Prior to joining Synapse in 2006, I worked as a regulatory consultant  
18 with CRA International, formerly Tabors Caramanis & Associates, as well as with  
19 the Tellus Institute. Earlier in my career I served as Assistant Deputy Minister of  
20 Energy for the Province of Nova Scotia.

21 I have a Master of Science in Energy Technology and Policy from the  
22 Massachusetts Institute of Technology and a Bachelor of Industrial Engineering  
23 from the Technical University of Nova Scotia, now merged with Dalhousie  
24 University.

25 My resume is attached as Exhibit\_\_\_\_(JRH-1).

1 **Q. What is the purpose of your testimony?**

2 A. Synapse was retained by the OCC to review gas supply, cost allocation and rate  
3 design issues in the general rate case filed by Connecticut Natural Gas (“CNG” or  
4 “Company”) with the Department of Public Utility Control (“DPUC” or  
5 “Department”). My testimony addresses two issues covered in the pre-filed  
6 testimony of the Gross Margin Panel, CNG’s gas supply strategy and its proposed  
7 rate recovery prior to resolution of the Phase 2 Rate Design proceeding.

8 **Q. What data sources did you rely upon to prepare your testimony?**

9 A. My primary sources of data were the Direct Testimony filed by witnesses for the  
10 Applicants and responses to information requests.

11 **Q. Please summarize your testimony.**

12 A. CNG’s current strategy for satisfying its service obligation to firm sales customers  
13 consists essentially entirely of purchasing gas supply. There is evidence to  
14 suggest that an alternative strategy, incorporating cost-effective efficiency  
15 improvement measures in addition to gas supply, could satisfy that obligation at  
16 lower cost. If a future review of its gas supply costs results in such a finding,  
17 CNG should be expected to implement a strategy including cost-effective  
18 efficiency measures.

19 Until new rates are established in Phase 2, CNG is proposing to apply the  
20 percentage change in non-gas revenue requirements approved in this phase  
21 uniformly to each rate component of each firm service. That proposal rests upon  
22 an unsupported assumption that the DPUC will ultimately approve significant  
23 increases in the fixed charge components of those rate schedules in Phase 2.  
24 Instead, until rates are set in Phase 2, any percentage change in total non-gas  
25 revenue requirements approved in this phase should be applied uniformly to each  
26 firm service rate schedule and the delivery charge component in that schedule  
27 should be revised to reflect that incremental amount.

28

1 **Gas Supply Strategy**

2 **Q. What is the relationship between CNG's obligation to its firm sales service**  
3 **customers and its gas supply strategy?**

4 A. As a regulated utility, CNG has an obligation to provide reliable service at  
5 reasonable rates. CNG's current strategy for satisfying its obligation to firm sales  
6 service customers consists essentially entirely of purchasing gas to supply their  
7 consumption requirements.

8 **Q. What is the potential problem with a strategy that continues to rely almost**  
9 **exclusively on gas supply?**

10 A. By continuing to rely exclusively on a gas supply strategy, CNG may eventually  
11 fail to provide reliable service at reasonable rates. An alternative strategy that  
12 includes an appropriate emphasis on efficiency improvement measures, in  
13 addition to gas supply, may be the optimal approach.

14 **Q. Is there evidence to support consideration of an alternative strategy**  
15 **incorporating cost-effective efficiency improvement measures?**

16 A. Yes.

17 The Gross Margin Panel spends a considerable portion of their pre-filed testimony  
18 on three major points relevant to CNG's future strategy. Those points are that:

- 19 • gas supply prices are approximately four times higher than they were in  
20 the 1990's, an all-time high, and are not expected to decline materially in  
21 the next several years;
- 22 • existing capacity to bring supply from producing areas to Connecticut is  
23 fully subscribed and incremental capacity will be expensive and require  
24 long lead-times; and
- 25 • demand is projected to continue to grow.

1 In light of these market conditions one must question how CNG will meet future  
2 demand for firm service from existing and new load and at what cost.

3 There is ample evidence that improvements in efficiency can reduce consumption  
4 requirements, without reducing service quality or comfort, and thereby delay or  
5 avoid the need to acquire new production and/or capacity resources. Some gas  
6 utilities in other jurisdictions have recognized the benefits of including efficiency  
7 improvement measures in their strategy. A recent review prepared for the  
8 Canadian Association of Members of Public Utility Tribunals (“CAMPUT”)  
9 indicates that spending on gas DSM ranging between 1% and 2% of annual  
10 revenues is consistent with industry practice<sup>1</sup>. By way of comparison, a 1%  
11 spending level applied to CNG’s proforma net cost of firm gas would mean an  
12 efficiency measure budget of \$2.6 million, as compared to CNG’s current budget  
13 of \$0.75 million.

14 **Q. Did CNG consider cost-effective efficiency improvement measures as part of**  
15 **its strategy when preparing this filing?**

16 A. No. CNG does not know the remaining potential for cost-effective efficiency  
17 measures in its service territory (OCC-123) and did not take such measures into  
18 consideration in its supply plan (OCC-121). CNG does plan to evaluate supply  
19 costs versus conservation costs in its 2006 Integrated Resource Plan pursuant to  
20 an August 9, 2006 Department Decision in Docket No. 04-10-02, DPUC Review  
21 of the Connecticut Gas Utilities’ Forecasts of Conservation, Demand and Supply  
22 2005-2009. In that Decision the DPUC directed CNG, and the other Connecticut  
23 LDCs, to provide better quantification and analyses of their conservation  
24 programs.

---

<sup>1</sup> Violette, Dan and Sedano, Richard; *Demand-Side Management : Determining Appropriate Spending Levels and Cost-Effectiveness Testing*, CAMPUT, January 30, 2006. www.camput.org

1 **Q. What do you recommend?**

2 A. I recommend that future reviews of CNG's gas supply strategy and costs  
3 determine whether an alternative strategy, incorporating an appropriate emphasis  
4 on efficiency improvement measures in addition to gas supply, would meet firm  
5 customer requirements with the same reliability at lower cost. If such a  
6 determination is made, CNG should be expected to implement such a strategy.

7

8 **Rate Recovery Prior To Resolution Of Phase 2**

9 **Q. Please describe the Company's proposal for recovering its requested rate**  
10 **increase on an interim basis.**

11 A. As an interim measure, the Company is proposing to collect the level of  
12 incremental non-gas revenue ultimately approved in this proceeding by applying  
13 the percentage change uniformly to each rate component of each firm service  
14 schedule (Gross Margin Panel, page 52). In Phase 2 of this proceeding CNG will  
15 file a cost of service study ("COSS") and propose the final levels at which each of  
16 these rate components should be set based upon the results of that COSS.

17 **Q. Is the Company's interim rate recovery proposal reasonable?**

18 A. No. CNG maintains that its interim proposal provides an opportunity to  
19 implement "...two moderate and progressive increases to fixed charge rate  
20 components rather than one larger fixed charge rate increase in Phase 2 of this  
21 case." This statement indicates that CNG is assuming it will convince the DPUC  
22 to approve increases of more than 34% for the fixed charge components of each  
23 rate schedule in Phase 2. However, CNG has not provided any analyses in this  
24 proceeding to support that assumption (OCC-133). Moreover it is not appropriate  
25 for CNG to rely on the results of its COSS filed in the rate design phase of its last  
26 general rate proceeding as support for its proposal in this proceeding. As noted  
27 earlier, CNG will file a new COSS in this proceeding that will receive a new  
28 review.

1 **Q. Is the Company's interim rate recovery proposal supported by the DPUC**  
2 **decision in Docket No. 05-09-09?**

3 A. No. CNG characterizes the DPUC decision of January 18, 2006 in Docket No.  
4 05-09-09 ("Decoupling Docket") as encouraging "...progressive, moderate  
5 increases to fixed charges." The actual text from the DPUC's conclusions in that  
6 Docket reads:

7 *Based on the Department's analysis and the current incentives and*  
8 *practices of the electric DCs, the Department would not recommend any*  
9 *additional regulatory changes at this time, except to explore making*  
10 *modest increases to fixed charges in each electric DC's next rate case.*

11 The DPUC, in reference to electric distribution companies, is not encouraging  
12 changes but is instead simply indicating a willingness to explore such changes.

13 **Q. What other approach could CNG use to recover any change in non-gas**  
14 **revenue requirements approved in this phase on an interim basis?**

15 A. CNG could recover any change in revenue requirements approved in this phase by  
16 applying the percentage change uniformly to each firm rate schedule and then  
17 setting the delivery charge to collect that incremental amount. Exhibit\_\_\_(JRH-2)  
18 presents an illustration of this approach, and a comparison to the Company's  
19 proposed approach. My use of data from the Company's filing in this Exhibit  
20 should not be interpreted as an acceptance that the Company's requested increase  
21 is justified. That data is simply presented for purposes of illustration and  
22 comparison.

23 **Q. What do you recommend?**

24 A. Any change in total non-gas revenue requirements approved in this phase should  
25 be applied uniformly to each firm rate schedule and recovered on an interim basis  
26 by changing the delivery charge component to reflect that incremental amount.

27 **Q. Does this complete your testimony at this time?**

28 A. Yes.

## **James Richard Hornby**

**Senior Consultant**

**Synapse Energy Economics, Inc.**

**22 Pearl Street, Cambridge, MA 02139**

**(617) 661-3248 ext. 243 • fax: (617) 661-0599**

**www.synapse-energy.com**

**rhornby@synapse-energy.com**

### **PROFESSIONAL EXPERIENCE**

**Synapse Energy Economics, Inc.**, Cambridge, MA. *Senior Consultant*, 2006 to present.

Analysis and expert testimony regarding planning, market structure, ratemaking and contracting issues in the electricity and natural gas industries.

**Charles River Associates (formerly Tabors Caramanis & Associates)**, Cambridge, MA.

*Principal*, 2004-2006.

*Senior Consultant*, 1998-2004.

Provided expert testimony and litigation support in several energy contract price arbitration proceedings, as well as in electric and gas utility ratemaking proceedings in Ontario, New York, Nova Scotia and New Jersey. Managed a major productivity improvement and planning project for two electric distribution companies within the Abu Dhabi Water and Electricity Authority. Analyzed a range of market structure and contracting issues in wholesale electricity markets.

**Tellus Institute**, Boston, MA.

*Vice President and Director of Energy Group*, 1997–1998.

Presented expert testimony on rates for unbundled retail services in restructured retail markets and analyzed the options for purchasing electricity and gas in those markets.

*Manager of Natural Gas Program*, 1986–1997.

Prepared testimony and reports on a range of gas industry issues including market structure, unbundled services, ratemaking, strategic planning, market analyses, and supply planning.

**Nova Scotia Department of Mines and Energy**, Halifax, Canada; 1981–1986

*Member*, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986

Member of a federal-provincial board responsible for regulating petroleum industry exploration and development activity offshore Nova Scotia.

*Assistant Deputy Minister of Energy* 1983–1986

Responsible for analysis and implementation of provincial energy policies and programs, as well as for Energy Division budget and staff. Directed preparation of comprehensive energy plan emphasizing energy efficiency and use of provincial energy resources. Senior technical advisor on provincial team responsible for negotiating and implementing a federal/provincial fiscal, regulatory, and legislative regime to govern offshore oil and gas. Directed analyses of proposals to develop and market natural gas, coal, and tidal power resources. Also served as Director of Energy Resources (1982-1983) and Assistant to the Deputy Minister (1981-1982).

---



**Nova Scotia Research Foundation**, Dartmouth, Canada, Consultant, 1978–1981  
Edited Nova Scotia's first comprehensive energy plan. Administered government-funded industrial energy conservation program—audits, feasibility studies, and investment grants.

**Canadian Keyes Fibre**, Hantsport, Canada, Project Engineer, 1975–1977

**Imperial Group Limited**, Bristol, England, Management Consultant, 1973–1975

### **SELECTED TESTIMONY**

Testimony before an arbitration panel in Toronto, Ontario, on behalf of a cogeneration plant regarding a dispute over a component of the price for steam under a 20-year contract. January 2006.

Testimony before an arbitration panel in Halifax, Nova Scotia, on behalf of Nova Scotia Power against Shell Canada regarding the determination of a new price under their ten year natural gas supply contract. October 2005.

State of New York, Public Service Commission, Case 00-M-0504, September 2002 and October 2002. Review of estimates of embedded costs of unbundled services (e.g., supply, distribution, metering, billing), and associated proposed rates, filed by Consolidated Edison of New York and New York State Electric and Gas respectively.

State of New Jersey Board of Public Utilities, BPU Docket GM00080564, April 2001. Analysis of the proposed transfer of gas supply and capacity contracts from Public Service Electric and Gas to an unregulated affiliate, and the full requirements supply contract associated with that transfer.

Nova Scotia Utility and Review Board, NSUARB-NG-SEMPRA-SEM-00-08, February 2001. Review of proposed distribution service tariff, including methodology for setting market-based rates, rates for large customers and default supply.

State of New Jersey Board of Public Utilities, BPU Docket EX99009676, March 2000. Analysis of the design and pricing of customer account services to be offered by utilities on an unbundled basis.

United States of America Bonneville Power Administration, BPA Docket WP-02, (TCA #391), November 1999. Functionalization of Communication Plant.

South Carolina Public Service Commission, 99-006-G, South Carolina Electric and Gas, October 1999. Reasonableness of purchased gas costs.

State of New Jersey Board of Public Utilities, BPU Dockets GO99030122–GO99030125, July 1999 and sur-rebuttal September 1999. Analysis of service unbundling policies and rates proposed in filings of Public Service Electric & Gas, South Jersey Gas, New Jersey Natural Gas, and Elizabethtown Gas.

Maine Public Utilities Commission, Docket 97-393, Northern Utilities Inc., September 1998 and rebuttal December 1998. Review of request for approval of rate redesign and partial unbundling proposal.

Pennsylvania Public Utility Commission, R-00984281, A-12250F0008, Peoples Natural Gas, May 1998. Analysis of the reasonableness of 1998 1307(f) filing and proposal to transfer production assets to affiliate.

State of New Jersey, Board of Public Utilities, BPU E09707 0465, OAL PUC-7309-97, BPU E09707 0464, OAL PUC-7310-97, January 1998 with Supplemental and Sur-rebuttal March 1998. Analysis of rate unbundling filing of Rockland Electric Company.

State of New Jersey, Board of Public Utilities, BPU EO9707 0459, OAL PUC- 7308-97, BPU E09707 0458, OAL PUC-7307-97, November 1997. Analysis of rate unbundling filing of Jersey Central Power & Light Company d/b/a GPU Energy.

Pennsylvania Public Utility Commission, R-00963858, Equitable Gas Company, June 1997 with rebuttal and sur-rebuttal July 1997. Analysis of the reasonableness of rate structure proposals.

Pennsylvania Public Utility Commission, R-00973896 and A-0012250F-0007, (Tellus 97-065) Peoples Natural Gas Company, May 1997. Review of 1997 1307(f) filing, proposal to transfer producing assets to CNG Producing Company, and proposed Migration Rider.

South Carolina Public Service Commission, 97-009-G, South Carolina Pipeline Corporation, April 1997. Reasonableness of proposal to acquire an additional 75,700 Mcf/day of capacity from Transco.

Federal Energy Regulatory Commission, RP95-197-001, RP97-71-000, March 1997. Review of proposed rolled-in ratemaking for Leidy Line incremental facilities.

Arkansas Public Service Commission 95-401-U, Arkla, September 1996. Review of proposed gas purchasing and transportation plan.

Maine Public Utilities Commission, 95-480, 95-481, April 1996, proposed Precedent Agreement between Northern Utilities, Inc. and Granite State Gas Transmission, Inc. for LNG Storage Service (95-480); and PNGTS for Transportation Service (95-481).

Rhode Island Public Utilities Commission, 2025, November 1995, Settlement Agreement reached between ProvGas and the Division of Public Utilities and Carriers.

Pennsylvania Public Utility Commission, R-953406, October 1995, application of T.W. Phillips Gas and Oil Co. for increase in rates and changes in rate and tariff design.

Illinois Commerce Commission, 95-0219, August 1995, application of Northern Illinois Gas Company for increase in rates and changes in rate and tariff design.

Pennsylvania Public Utility Commission, R-953316, May 1995, purchased gas costs and gas procurement of Columbia Gas of Pennsylvania with Supplemental Direct Testimony and Sur-Rebuttal Testimony.

Pennsylvania Public Utility Commission R-943252, (Tellus 95-039), May 1995, application of Peoples Natural Gas Company for increase in rates and changes in rate and tariff design.

South Carolina Public Service Commission, 94-007-G, (Tellus 95-038), April 1995, reasonableness of 1994 purchased gas costs of South Carolina Pipeline Corporation.

Pennsylvania Public Utility Commission R-943207, (Tellus 95-014), March 1995, 1995 Purchased Gas Adjustment filing of National Fuel Gas Distribution Corp.

Pennsylvania Public Utility Commission, R-00943063, (Tellus 94-271), December 1994, design of FERC Order 636 transition cost tariff of UGI Utilities, Inc.

South Carolina Public Service Commission, 94-008-G, (Tellus 94-173), October 1994, 1994 Purchased Gas Adjustment of South Carolina Electric and Gas Co.

Oklahoma Corporation Commission, PUD 920, 001342, (Tellus 93-250) September 1994, reasonableness of gas supply strategy of Public Service of Oklahoma, including payments to Transok, Inc. for transportation and agency services and rate mechanism for cost recovery. November 1994 Rebuttal testimony in above docket.

Pennsylvania Public Utility Commission, R-943078, (Tellus 94-155), September 1994, Market Sensitive Sales Service proposed by Pennsylvania Gas and Water Company (PG&W).

Massachusetts Department of Public Utilities, D.P.U. 93-141-A, (Tellus 94-184), September 1994, response to questions regarding policies on interruptible transportation and capacity release in DPU IT/CAPACITY RELEASE SCOPE document dated June 16, 1994. October 1994 Comments in above docket.

Hawaii Public Utilities Commission, 7259, (Tellus 94-020), August 1994, HELCO'S proposed DSM programs for competitive energy end-use markets and its multi-attribute analysis.

Pennsylvania Public Utility Commission, R-00943066, (Tellus 94-135), July 1994, 1994 Purchased Gas Adjustment of Pennsylvania Gas and Water Company. August 1994 Sur-rebuttal testimony in above docket.

Pennsylvania Public Utility Commission, R-942993, R-942993 C0001-C0004, (Tellus 94-110), May 1994, proposal of Pennsylvania Gas and Water Company for recovery of FERC Order 636 transition costs. May 1994 Rebuttal testimony in above docket.

Pennsylvania Public Utility Commission, R-943001, (Tellus 94-018), May 1994, application of Columbia Gas of Pennsylvania for an increase in rates and changes in rate design, specifically Negotiated Sales Service.

Pennsylvania Public Utility Commission, R-943029, (Tellus 94-093), May 1994, 1994 Purchased Gas Adjustment of Columbia Gas of Pennsylvania.

Pennsylvania Public Utility Commission, R-932866, R-932915, (Tellus 93-243), 1994, Direct and rebuttal testimony on application of Peoples Natural Gas Company for increase in rates and changes in rate design. March 1994 Rebuttal testimony in above docket.

Kansas Corporation Commission, 180,056-U, (Tellus 92-105), February 1994, Oral Testimony on IRP Rules for gas utilities.

Arizona Corporation Commission, E-1032-93-111, (Tellus 93-099), December 1993, application of Citizens Utility Company, Arizona Gas Division, for an increase in rates, and changes in rate design. January 1994 Sur-rebuttal testimony in above docket.

Hawaii Public Utilities Commission, 7257 (Tellus 93-144B5), December 1993, proposed DSM programs for end-use markets, specifically HECO's residential sector water heating program.

Hawaii Public Utilities Commission, 7261 (Tellus 93-171), September 1993, GASCO IRP. December 1993 Rebuttal testimony in above docket.

Pennsylvania Public Utility Commission, R-932655, R-932655 C001, R-932655 C002, (Tellus93-149), September 1993, balancing service charge proposed by PG&W.

Pennsylvania Public Utility Commission, R-932676, (Tellus 93-092), July 1993, 1993 Purchased Gas Adjustment filing of Pennsylvania Gas and Water Company. July 1993 Rebuttal Testimony in above docket.

Public Utilities Commission of Rhode Island, 2025, (Tellus 93-018), April 1993, Providence Gas Company Integrated Resource Plan.

Pennsylvania Public Utility Commission, I-900009, C-913669, (Tellus 91-074), March 1993, Equitable's charges for transportation service and cost allocation methods in general.

Arkansas Public Service Commission, 92-178-U, (Tellus 92-014), August 1992, Stipulation and Agreement concerning gas cost and purchasing practices issues in Dockets No.91-093-U (Arkla Energy Resources) and No. 92-032-U (Arkansas Louisiana Gas).

Colorado Public Utilities Commission, 91R-642EG, (Tellus 91-203), August 1992, Draft, proposed gas integrated resource planning (IRP) rule.

Pennsylvania Public Utility Commission, R-00922324, (Tellus 92-117), July 1992, 1992 Purchased Gas Adjustment filing of PG&W. July 1992 Supplemental Testimony in above docket.

Pennsylvania Public Utility Commission, R-922180, (Tellus 92-039), May 1992, application of Peoples Natural Gas Company for an increase in rates and accompanying changes, in rate design. June 1992 Rebuttal Testimony in above docket. June 1992 Sur-rebuttal Testimony in above docket

Michigan Public Commission, U-10030, (Tellus 91-120), April 1992, 1992 Gas Cost Recovery Plan submitted Service by Consumers Power Company, specifically the role of demand-side management as a resource in five-year forecast and supply plan.

Pennsylvania Public Utility Commission, R-912140, (Tellus 92-038), March 1992, review of 1992 Purchased Gas Adjustment of T.W. Phillips.

Federal Energy Regulatory Commission, RP91-161-000 et al., RP91-160-000 et al., (Tellus 91-175), February 1992, review of cost allocation and rate design issues in rate case application of Columbia Gas Transmission and Columbia Gulf Transmission (on behalf of PA OCA).

Arkansas Public Service Commission, 91-093-U, (Tellus 92-014), February 1992, establishment of a base cost of gas for Arkla Energy Resources (AER), modification of Purchased Gas Adjustment (PGA). June 1992 Sur-rebuttal Testimony in above docket.

New Hampshire Public Utilities Commission, DR90-183, (Tellus 91-164), January 1992, role of embedded cost-of-service studies, level of customer charges, seasonal differential in commodity rates; and class revenue requirements (Energy North Natural Gas, Inc.).

Arizona Corporation Commission, U-1551-89-102 & U-1551-89-103, U-1551-91-069, (Tellus 90-203) September 1991, Gas Procurement Practices and Purchased Gas Costs (January 1986 – November 1990) of Southwest Gas Corporation. December 1991. Rebuttal Testimony in above docket.

Maryland Public Service Commission, 8339, (Tellus 91-79), July 1991, cost allocation and rate design issues in rate case application of Baltimore Gas and Electric Company.

Public Utilities Commission of Rhode Island, 1727, (Tellus 90-135), June 1991, review of gas procurement practices of Bristol and Warren Gas Company. Sept. 1991, (Tellus 91-165), Supplemental Direct Testimony in above docket.

New Mexico Public Service Commission, 2367, (Tellus 91-030), June 1991, analysis of gas transportation policies proposed by Gas Company of New Mexico.

Pennsylvania Office of Consumer Advocate, R-911889, (Tellus 91-025), March 1991, review of gas supply strategy and purchasing practices of T.W. Phillips.

Michigan Public Service Commission, U-9752, (Tellus 90-099), March 1991, review of 1991 Gas Cost Recovery Plan submitted by Michigan Gas Company to Michigan PSC.

Arkansas Public Service Commission, 90-036-U, (Tellus 90-041), August 1990, reasonableness of certain gas supply contracts, of Arkla, Inc. and its various subsidiary companies including the Arkla-Arkoma transactions. September 1990. Prepared Rebuttal Testimony.

Arizona Corporation Commission, U-1240-90-051, (Tellus 90-059), August 1990, application of Southern Union Gas Company for a change in tariffs.

Public Utility Commission of Utah, 89-057-15, (Tellus 89-242), July 1990, Cost Allocation and Rate Design, Mountain Fuel Supply. August 1990 Rebuttal and Sur-rebuttal Testimony.

Pennsylvania Public Utility Commission, R-901595, (Tellus 90-043), June 1990, application of Equitable Gas Company for changes to its tariffs.

West Virginia Public Service Commission, 90-196-E-GI, 90-197-E-GI, (Tellus 90-025), May 1990, expanded Net Energy Cost, coal supply strategy and contracting practices, APS.

Pennsylvania Public Utility Commission, R-891572, (Tellus 90-08B), March 1990, Purchased Gas Costs and Gas Procurement, T.W. Phillips Gas and Oil Co.

Public Utilities Commission of Colorado, 89R-702G, (Tellus 89-30A), January 1990, policies and rules for gas transportation service offered by public utilities regulated by the Commission. January 1990, (Tellus 89-30B), Supplemental Testimony

Arizona Corporation Commission, U-1551-89-102 and U-1551-89-103, (ESRG 89-01), October 1989, Regulatory Oversight of Purchased Gas Costs.

Public Utilities Commission of Rhode Island, 1938, (ESRG 89-139), October 1989, Sales Forecast, Cost Allocation, Rate Design, Narragansett Electric Company.

Pennsylvania Public Utility Commission, R891293, (ESRG 89-92), July 1989, Purchased Gas Costs & Gas Procurement, Pennsylvania Gas and Water. July 1989 Rebuttal Testimony.

Pennsylvania Public Utility Commission, R891236, (ESRG 89-48), May 1989, Take-or-Pay Cost Recovery, Columbia Gas of Pennsylvania.

New Jersey Board of Public Utilities, GR 88070-877, (ESRG 88-150A), February 1989, Take-or-Pay Cost Recovery, Public Service Electric and Gas.

New Jersey Board of Public Utilities, GR 88080-913-Phase II (ESRG 88-150C), February 1989, Take-or-Pay Cost Recovery, South Jersey Gas Company.

New Jersey Board of Public Utilities, GR 88081-019-Phase II (ESRG 88-150D), February 1989, Take-or-Pay Cost Recovery, Elizabethtown Gas Company.

New Jersey Board of Public Utilities, 88080913, (ESRG 88-102), December 1988, Take-or-Pay Cost Recovery, Elizabethtown Gas Company.

Montana Public Service Commission, 87.7.33, 88.2.4, 88.5.10, 88.8.23, (ESRG 88-117), December 1988, Gas Procurement, Transportation Service, Gas Adjustment Clause, Montana-Dakota Utilities Company.

New Jersey Board of Public Utilities, GR 88081-019, (ESRG 88-103), November 1988, Take-or-Pay Cost Recovery, South Jersey Gas Company.

New Jersey Board of Public Utilities, GR 88070-877 (ESRG 88-89), October 1988, Take-or-Pay Cost Recovery, Public Service Electric and Gas.

Public Service Commission of District of Columbia, Formal Case 874, (ESRG 88-58), September 1988, Gas Acquisition, Gas Cost Allocation, Take-or-Pay Cost, Regulatory Oversight; District of Columbia Natural Gas.

Illinois Commerce Commission, 88-0103, (ESRG 88-68), July 1988, Take-or-Pay Cost Recovery.

Public Service Commission of West Virginia, 240-G, (ESRG 88-42), June 1988, Gas Transportation Rate Design.

Pennsylvania Public Utility Commission, R-880958, (ESRG 88-29), June 1988, Purchased Gas Adjustment, Pennsylvania Gas & Water Company.

Public Service Commission of Utah, 86-057-07, (ESRG 87-111), March 1988, Gas Transportation Rate Design; Mountain Fuel Supply.

South Carolina Public Service Commission, 83-126-G, 86-217-G, (ESRG 87-106), January 1988, Gas Supply and Rate Design, Piedmont Gas Company.

South Carolina Public Service Commission, 87-227-G, (ESRG 87-64), September 1987, Gas Supply and Rate Design, South Carolina Electric and Gas.

Arizona Corporation Commission, U-1345-87-069, (ESRG 87-48), September 1987, Fuel Adjustment Clause.

## **SELECTED RESEARCH AND CONSULTING, PUBLICATIONS, AND PRESENTATIONS**

Research and analysis underlying testimony filed before the Ontario Energy Board by Mr. Ralph Luciani on behalf of Greater Toronto Airport Authority regarding rates for standby and distribution service to customers with load displacement generation, Docket No. RP-2005-0020, January 2006. CRA # DO8676-00.

Consulting services to Abu Dhabi Water and Electricity Authority on electric distribution system performance. Identify metrics for technical, economic and service quality performance, establish benchmarks, develop and help implement, a decision-making framework and a set of decision-support tools for identifying and evaluating measures to improve productivity. (2003–2004)

Litigation support, research and analysis underlying testimony filed by Dr. Richard Tabors and Dr. Assef Zobian on behalf of ProGas in two gas supply contract arbitration proceedings regarding the interpretation of, and arbitration proceedings regarding, the pricing provisions in their long-term gas supply contracts with Ocean States Power. (2000 –2004)

*Review of Initial Report on Company-Specific Separate Proceedings and Generic Reevaluations; Published Natural Gas Price Data; and Enron Trading Strategies, August 2002.* Co-author of report to Powerex Corporation, filed in FERC Docket A02-2.TCA # 592. (2002)

Consulting to the Nova Scotia Petroleum Directorate regarding interpretation of fiscal arrangements in the Canada-Nova Scotia Offshore Petroleum Resources Accord. TCA #781. (2002)

Research and analysis underlying testimony filed before the Federal Energy Regulatory Commission by Dr. Richard Tabors on behalf of Powerex Corporation and the Transaction Finality Group regarding the need for price mitigation in the Pacific Northwest, Docket Nos. EL01-10-000; EL01-10-001, October 2001. TCA # 592.

Research and analysis underlying testimony filed before the Michigan Public Service Commission by Dr. Richard Tabors regarding methodologies for calculating stranded costs and the market value of the generating units of DECo and of Consumers Energy Company based on sales of comparable units. Case No. U-12639, April 2001. TCA # 516.

Consulting to the Houston-Galveston Area Council on the formation of an electric aggregation for city and county governments. TCA #585. (2001)

Consulting to Staff of the Arkansas Public Service Commission regarding gas-purchasing practices of local gas utilities. TCA #582. (2001–2002)

Consulting to the South Carolina Department of Consumer Affairs on a range of gas utility ratemaking issues. TCA #548. (2001–2002)

Review of the cost-benefit analysis of RTO West, and the challenges to that analysis. TCA #646 (2001–2002).

Consulting to an independent power plant regarding the reasonableness of the rate it was being charged for utility standby service. TCA #518 (2000).

Consulting to an energy marketer regarding a strategy for energy service providers to replace utilities as providers of standard offer and default services. TCA #517. (2000)

Consulting to the Nova Scotia Petroleum Directorate on the tariff for gas distribution service and on policies to govern the licensing of retail gas suppliers. TCA #461. (2000)



Assistance to the National Association of State Utility Consumer Advocates (NASUCA) in reviewing, and preparing comments on, *Regulation of Short-Term Natural Gas Transportation Services* (FERC Docket RM98-10-000) and *Regulation of Interstate Natural Gas Transportation Services* (FERC Docket RM98-12-000). Tellus 98-014. Principal investigator, 1998.

Assistance to the Oklahoma Attorney General's Office re: Oklahoma Corporation Commission's Rulemaking Proceedings on Gas Unbundling in Oklahoma. OCC Case No. RM9700009. Tellus No. 97-105, 1997.

Assistance to the Province of Nova Scotia re: The Sable Offshore Energy Project and related pipeline projects. Assessment of U.S. market for Nova Scotia gas—demand, existing supply, proposed supply. Tellus 96-209, 1997.

Consulting to Massachusetts Division of Energy Resources re retail gas market restructuring, including proposals in Boston Gas rate case. Docket 96-50. Tellus 96-064 (1996–1998).

Consulting to Pennsylvania Office of Consumer Advocate. Gas Industry Restructuring in Pennsylvania. Tellus analyzed key issues raised by the proposed legislation for restructuring the gas industry in Pennsylvania. Tellus 95-323, 95-093, (1996–1998)

Consultant to Staff of the Georgia Public Service Commission as sub-contractor to Foster Associates. Atlanta Gas Light rate cases and rate unbundling filing. Tellus No. 97-099. (1997–1998)

Consultant to Consumers Gas and Nova Scotia Power Corporation regarding the preparation of an application for a gas distribution franchise in Nova Scotia. Tellus No. 97-209. (1997)

Consultant to Staff of the Colorado Public Service Commission regarding retail gas market restructuring. Tellus No. 97-150. (1997)

Consultant to Maine Office of Public Advocate regarding retail gas market restructuring. Docket No. 97-267. Tellus No. 97-132 (1997).

Consulting to So. Carolina Division of Consumer Advocate re: future structure and regulation of gas services in South Carolina. Docket No. 94-719-G. Tellus No. 96-025 and 95-120 (1995–1996).

Consulting to Pennsylvania Office of Consumer Advocate regarding pilot programs of retail choice for gas, Borough of Pleasant Hills, Allegheny County, et al. Docket No. P-00950980. Tellus 95-323. (1996–1997)

Comments of the Pennsylvania Office of Consumer Advocate on FERC's Notice of Proposed Rulemaking dated February 14, 1995, regarding Alternatives to Traditional Cost-of-Service Ratemaking for Natural Gas Pipelines. (FERC Docket no. RM95-6-000.) Tellus No. 95-092. Principal investigator, 1995

*Natural Gas Growth in the State of Florida—Barriers and Benefits.* A report to Florida Energy Office Department of Consumer Affairs, Tellus No. 94-236, Principal Investigator, 1995.

*Analysis of Cost Implications of the Proposed LNG Facility in Wells, Maine, on Northern Utilities' Ratepayers.* Tellus Study No. 95-015. Co-author, 1995.

Comments of Joint Consumer Advocates on Issues Raised by the FERC Notice of Public Conference dated October 28, 1993, specifically (1) rate and valuation treatment to be accorded the profits or losses associated with the sale or abandonment of gathering facilities, and (2) appropriate rate design for gathering and related production expenses. (FERC Docket No. RM94-4-000) Tellus No. 93-264. Principal investigator. (1993–1994)

*A Framework for Future Regulation of Gas Services in Maryland.* Recommendations of Staff of the Maryland Public Service Commission. Tellus Study No. 93-273. Principal investigator, 1994.

*Projections of Fuel Prices in Vermont: Summer 1993.* Technical Report 28 to Vermont Department of Public Service. Tellus Study No. 93-026. Principal investigator, 1993.

*GASCO, Inc. Integrated Resource Plan Report.* Volume 1 and 2. Before the Public Utilities Commission, State of Hawaii. Docket No. 7261. Project manager and principal investigator, 1993.

Position Paper on Gas Integrated Resource Planning, N.Y.P.S.C. Docket No. 93-G-0326. Assistance to Pace Energy Project et al. in developing comments on gas integrated resource planning. Tellus No. 93-163. Co-author, 1993.

*Advertising Costs in Demand-Side Management Programs.* A report to: The Corporation Commission Staff, Phoenix, Arizona. Tellus Study No. 93-103. Co-author, 1993.

Proposed Rules Governing Integrated Resource Planning for Electric and Natural Gas Utilities Regulated by the State of Kansas. In collaboration with Kansas Corporation Commission Staff. Tellus Study No. 92-105. Co-author, 1993.

Consultant to Pennsylvania Office of Consumer Advocate regarding FERC Order 636, Impact on Purchased Gas Costs, T.W. Phillips Gas and Oil Co. (Tellus No. 93-021), 1993

Consultant to Staff of the Maryland Public Service Commission. Review and critique of the DSM Plans of five Maryland natural gas utilities. Tellus Study No. 91-222. Project manager and principal investigator, 1992/3.

*The Analysis of Residential Gas Heat Pumps as a DSM Measure from an Integrated Resource Planning Perspective.* A report to: The American Gas Cooling Center, Arlington, VA. Tellus Study No. 91-265. Co-author, 1992.

*Management Audit of Arkla, Inc. Regarding Its Compliance with the Least-Cost Purchasing Statute of the State of Arkansas.* A report to: The Staff of the Arkansas Public Service Commission. Tellus Study No. 91-080. Principal investigator. 1992

Preliminary Study on Integrated Resource Planning for the Consumers' Gas Company, Ltd. A report to: Consumers Gas Company, Ltd. Tellus Study No. 91-001. Co-author, 1992.

*Comments on Gas IRP Rule and Issues*, on behalf of: Pennsylvania Office of Consumer Advocate. Docket No. L-00920066. Tellus Study No. 92-141. Author, 1992.

Draft Comments to the New Mexico Attorney General in the Matter of an Inquiry by the New Mexico Public Service Commission into Integrated Resource Planning, for Natural Gas Utilities. Case No. 2449. Tellus Study No. 91-077. Principal investigator, 1992.

Projections of Fuel Prices in Vermont. Submitted to: Vermont Department of Public Service. Tellus Study No. 92-043. Principal investigator, 1992.

Informal and Preliminary Responses to Generic Questions on Gas Utility Demand Side Management Cost Recovery Issues. Before the Pennsylvania Public Utility Commission, on behalf of: Office of Consumer Advocate. Tellus No. 91-252. Author, 1992.

Consultant to District of Columbia Office of People's Counsel. Analysis and critique of the least-cost integrated plan of District of Columbia Natural Gas. Tellus Study No. 90-149. Project manager and principal investigator, 1991/2.

*America's Energy Choices: Investing in a Strong Economy and a Clean Environment* In collaboration with the Union of Concerned Scientists, the American Council for an Energy Efficient Economy, the Natural Resources Defense Council, and the Alliance to Save Energy. Tellus Study No. 90-067. Co-author, 1991.

Assistance to Wisconsin Gas Company regarding appropriate avoided cost calculations. Tellus No. 89-145, 1990.

Environmental Impacts of Long Island's Energy Choices: The Environmental Benefits of Demand-Side Management. A report to: Long Island Power Authority. Tellus Study No. 90-028A. Co-author, 1990.

Review of Southern Connecticut Gas Company's Conservation Impact Model. Prepared for The Conservation Collaborative Group: Southern Connecticut Gas Company; Connecticut Department of Public Utility Control (DPUC); Prosecutorial Division, DPUC; Office of Policy and Management/Energy Division; Office of Consumer Counsel. Tellus Study No. 90-084. Co-author, 1990.

*Conservation and Capacity Optimization Alternatives to the PGT/PG&E Gas Pipeline Project.* Prepared for: California Public Utilities Commission, under contract to: Jones & Stokes Associates, Inc. Tellus Study No. 90-03. Principal Investigator, 1990.

*Evaluation of Repowering the Manchester Street Station.* A report to: Rhode Island Division of Public Utilities and Carriers, Rhode Island Division of State Planning, and Rhode Island Governor's Office of Housing Energy and Intergovernmental Relations. Tellus Study No. 90-010. Co-author, 1990.

Consultant to Pennsylvania Office of Consumer Advocate regarding cost allocation and rate design issues, T.W. Phillips Gas and Oil Co. (R-891566). (Tellus 90-008), 1990.

Evaluation of gas supply and non-utility generation regarding Vermont utilities, for the Vermont Public Service Board. Tellus No. 89-110B, 1989.

Consultant to MCAAA on incentive ratemaking issues, Michigan Consolidated Gas Company, U-9475. (ESRG 89-213), 1989

Consultant to Maryland People's Counsel regarding review of three aspects of the application of Frederick Gas Company, Inc., for an increase in rates. (Study No. 89-137), 1989

*An Analysis of FERC Policy Statement Regarding Natural Gas Pipeline Rate Design.* A report prepared for the Maryland People's Counsel. ESRG Study No. 89-104. Principal Investigator, 1989.

Consultant to Staff of the Wisconsin Public Service Commission, Calculation of Avoided Natural Gas Costs. ESRG Project No. 89-80, 1989.

*Fuel Procurement Planning of Gas-Fired Cogeneration Projects Proposed for Massachusetts.* A report prepared for the Massachusetts Office of Energy Resources. ESRG Study No. 88-65. Principal Author, 1988.

Consultant to Staff of Arkansas Public Service Commission, Natural Gas Purchasing Practices. ESRG Project No. 87-03, 1987.

*A Review of Trends in Natural Gas Rate Design in the United States.* A report prepared for Gaz Metropolitan under subcontract to Econosult Limited. ESRG Study No. 87-24. Principal Author, 1987.

Towards an Energy Transition on Long Island: Issues and Directions for Planning. A report prepared for Nassau and Suffolk Counties. ESRG Study No. 87-05, 1987.

*An Evaluation of Kentucky's Fuel Adjustment Clause for Electric Utilities.* A report to the Kentucky Office of the Attorney General. ESRG Study No. 86-74. Principal author, 1986.

## SELECTED PUBLICATIONS AND PRESENTATIONS

*What If You Deregulated A Market And No One Shopped? Pricing Standard Offer Service in Electric Retail Markets.* Presented at the US Association of Energy Economists annual conference, Philadelphia, September 26, 2000.

*Developing an RFP for a Municipal Aggregation.* Presented at "Electric Deregulation: What's the Next Step for Municipalities", New Jersey State League of Municipalities, Iselin, New Jersey. May 5, 1999.

*Feasibility of Small Customer Aggregation for the Delivery of Comprehensive Energy Services in a Competitive Utility Environment.* An evaluation of the feasibility of alternative options for providing electricity and related services to residential customers in a competitive retail market. Project manager and principal author. Report prepared for the Department of Energy, Chicago Regional Office by Environmental Futures, Tellus Institute, and EUA Citizens Conservation. 1998.

*Natural Gas Price Volatility: Implications for Consumers.* Presented to National Association of State Utility Consumer Advocates, Boston, Massachusetts, November 11, 1997.

"Applying Performance-Based Ratemaking to Gas Utility Services," presented to: NASUCA 1996 Mid-Year Meeting, Chicago, Illinois. June 26, 1996.

"Unbundling: To be or not to be?" Fifth Annual DOE-NARUC Natural Gas Conference, Roundtable Moderator, 1996.

"New Approaches to Regulation of Gas Utilities: Unbundling and Performance-Based Ratemaking." A presentation to: National Association of Utility Consumer Advocates, Reno, Nevada. Co-author, 1994.

"Fuel Choice in Demand-Side Management: Creating a Level Playing Field for Gas and Electric DSM." A presentation to: New England Chapter—International Association for Energy Economics, MIT Faculty Club, 1994.

"Sensitivity Analysis of Avoided City-Gate Gas Costs." Presented at: NARUC/DOE Fifth National Conference of Integrated Resource Planning, Kalispell, MT, May 15-18. Co-author, 1994.

"Fuel Choice, Competition & DSM," *Energy Report*. Co-author, 1994.

"Fuel Choice in Demand-Side Management: Creating a Level Playing Field for Gas and Electric DSM." A presentation to: New England Chapter - International Association for Energy Economics, MIT Faculty Club, 1994.

"The Energy Policy Act of 1992 and Gas Integrated Resource Planning." Presented at: NARUC Workshop "Competition in the Energy Markets and its Impact on IRP", St. Louis, Missouri, May 25, 1993.

"Policy Issues Associated with Gas Integrated Resource Planning." Presented at: Natural Gas Seminar, Public Utilities Commission of the State of Colorado, Denver, Colorado, May 19, 1993.

"Sensitivity of Avoided City-Gate Gas Cost Estimates to Calculation Methods and Input Assumptions." A Working Paper presented at: Gas Integrated Resource Planning (IRP) Workshop, NARUC Gas IRP Subcommittee Meeting, NARUC Annual Conference, Los Angeles, CA, Co-author, November 15, 1992.

"Natural Gas Planning: An IRP Case Study." Presented at: The NARUC Conference on Integrated Resource Planning, Burlington, Vermont, Co-author, September 13-16, 1992.

"Major Sources of Controversy in Gas Least Cost Planning." Presented at: Washington Gas Least Cost Planning Conference, Washington, D.C., April 7-8, 1992.

"Calculating the Value of Avoided Gas Requirements: Methods and Results." Presented at: NARUC Third National Conference on Integrated Resource Planning, Santa Fe, NM, April 8-10, 1991.

"State Gas Issues in an Era of Open Access Transportation." A presentation to: National Association of State Utility Consumer Advocates, San Francisco, 1988.

"Setting Rates for Unbundled Services to Meet Competition," Proceedings of the Sixth NARUC Biennial Regulatory Information Conference, Columbus, Ohio, 1988.

"Offshore Gas and Oil: Progress and Prospects." A presentation to: Mining Society of Nova Scotia Annual Meeting, Ingonish, Nova Scotia, 1986.

*Energy Plan 1985.* Nova Scotia Department of Mines and Energy. Steering Committee Chairman, 1986.

*Nova Scotia Oil and Gas Report 1985.* Nova Scotia Department of Mines and Energy. Editor, 1985.

"The Canada-Nova Scotia Agreement on Offshore Oil and Gas Resource Management and Revenue Sharing." A presentation to: Canadian Bar Association Annual Meeting, Halifax, Nova Scotia, 1985.

*Coal in Nova Scotia.* Nova Scotia Department of Mines and Energy. Editor, 1985.

"Regulatory Approaches." A presentation to: Canadian Petroleum Association Offshore Operating Division Annual Workshop, Fairmont Hot Springs, British Columbia, 1985.

"Nova Scotia's Offshore Oil and Gas." A presentation to: Economic Council of Canada/University of Calgary Energy Conference, Calgary, Alberta, 1985.

*Nova Scotia Oil and Gas Report 1984.* Nova Scotia Department of Mines and Energy. Editor, 1984.

*Nova Scotia Natural Gas - An Alternative for the Northeast.* Nova Scotia Department of Mines and Energy. Editor, 1984.

*Oil and Gas Exploration in Nova Scotia 1982-83.* Nova Scotia Department of Mines and Energy. Editor, 1983.

*A Soft Energy Path for Nova Scotia.* Volume III of 2025: Soft Energy Futures for Canada. Report to Energy, Mines and Resources Canada by the Friends of the Earth. Co-author, 1983.

*Oil and Gas Exploration in Nova Scotia 1981-83.* Nova Scotia Department of Mines and Energy. Author, 1982.

"The Future of Coal Utilization in Nova Scotia." A presentation to: Chemical Institute of Canada Annual Conference, Halifax, Nova Scotia, 1981.

*Nova Scotia Natural Gas—An Alternative for the Northeast.* Nova Scotia Department of Mines and Energy. Editor, 1984.

*Energy, A Plan for Nova Scotia.* A proposal from the Energy Planning Task Force 1979. Editor and Coordinator, 1979.

*An Assessment of Government Policies to Promote Investments in Energy Conserving Technologies.* Thesis, Massachusetts Institute of Technology. Author, 1978.

Illustration of alternative approaches for interim recovery of a change in delivery service revenue requirements

Line/ Column	Rate	Description	Proforma		at Present Rates		Changes in customer, demand and delivery rates (CNG proposal)			Changes in delivery rates (Synopsis proposal)		
			Units	a	Rates	Revenues	Rates	Revenues	Increase	Rates	Revenues	Increase
				b	c	d	e	f = e-c	g	h	l = h - c	
1.	<b>RSG</b>	<b>Residential Non-Heat</b>										
2.		No. of Bills - Service	212,508	\$12.50	\$2,656,350	\$16.79	\$3,568,009	34.32%	\$12.50	\$2,656,350	0.00%	
3.		All Ccf - Delivery	3,438,790	\$0.6171	\$2,122,077	\$0.8289	\$2,850,413	34.32%	\$1.0940	\$3,762,072	77.28%	
4.		Sub-Total			\$4,778,427		\$6,418,422	<b>\$1,639,995</b>		\$6,418,422	<b>\$1,639,995</b>	
5.	<b>RSH</b>	<b>Residential Heating</b>										
6.		No. of Bills - Service	1,470,082	\$10.25	\$15,068,341	\$13.77	\$20,243,029	34.34%	\$10.25	\$15,068,341	0.00%	
7.		All Ccf - Delivery	137,379,470	\$0.3588	\$49,291,754	\$0.4819	\$66,203,167	34.31%	\$0.5196	\$71,377,855	44.81%	
8.		Sub-Total			\$64,360,095		\$86,446,196	<b>\$22,086,101</b>		\$86,446,196	<b>\$22,086,101</b>	
9.	<b>RMDS</b>	<b>Residential Multi-Dwelling</b>										
10.		No. of Bills - Service	16,224	\$25.00	\$405,600	\$33.58	\$544,802	34.32%	\$25.00	\$405,600	0.00%	
11.		All Ccf - Delivery	15,033,110	\$0.3267	\$4,911,317	\$0.4388	\$6,596,529	34.31%	\$0.4481	\$6,735,731	37.15%	
12.		Sub-Total			\$5,316,917		\$7,141,331	<b>\$1,824,414</b>		\$7,141,331	<b>\$1,824,414</b>	
13.	<b>SE-R</b>	<b>Seasonal Rate - Residential</b>										
14.		No. of Bills - Summer	836	\$20.00	\$16,720	\$26.86	\$22,455	34.30%	\$20.00	\$16,720	0.00%	
15.		No. of Bills - Winter	1,038	\$12.50	\$12,975	\$16.79	\$17,428	34.32%	\$12.50	\$12,975	0.00%	
16.		Winter Ccf - Delivery	34,110	\$0.6171	\$21,049	\$0.8289	\$28,274	34.32%	\$1.1276	\$38,462	82.72%	
17.		Sub-Total			\$50,744		\$68,157	<b>\$17,413</b>		\$68,157	<b>\$17,413</b>	
18.	<b>SGS</b>	<b>Small General Service</b>										
19.		No. of Bills - Service	135,008	\$25.00	\$3,375,200	\$33.58	\$4,533,569	34.32%	\$25.00	\$3,375,200	0.00%	
20.		Demand - ADPM	2,651,311	\$0.1000	\$265,131	\$0.1343	\$356,071	34.30%	\$0.10	\$265,131	0.00%	
21.		All Ccf - Delivery	26,820,000	\$0.3813	\$10,226,466	\$0.5121	\$13,734,522	34.30%	\$0.5587	\$14,983,831	46.52%	
22.		Sub-Total			\$13,866,797		\$18,624,162	<b>\$4,757,365</b>		\$18,624,162	<b>\$4,757,365</b>	
23.	<b>GS</b>	<b>General Service</b>										
24.		No. of Bills - Service	25,499	\$50.00	\$1,274,950	\$67.16	\$1,712,513	34.32%	\$50.00	\$1,274,950	0.00%	
25.		Demand - MDQ	2,413,465	\$0.7500	\$1,810,099	\$1.0074	\$2,431,325	34.32%	\$0.75	\$1,810,099	0.00%	
26.		All Ccf - Delivery	24,839,630	\$0.2278	\$5,658,468	\$0.3060	\$7,600,927	34.33%	\$0.3486	\$8,659,716	53.04%	
27.		Sub-Total			\$8,743,517		\$11,744,765	<b>\$3,001,248</b>		\$11,744,765	<b>\$3,001,248</b>	
49.	<b>LGS</b>	<b>Large General Service</b>										
50.		No. of Bills - Service	6,204	\$100.00	\$620,400	\$134.31	\$833,259	34.31%	\$100.00	\$620,400	0.00%	
52.		Demand - MDQ	3,418,698	\$1.2970	\$4,434,051	\$1.7421	\$5,955,714	34.32%	\$1.30	\$4,434,051	0.00%	
53.		All Ccf - Delivery	42,949,380	\$0.1075	\$4,617,058	\$0.1444	\$6,201,890	34.33%	\$0.1848	\$7,936,412	71.89%	
57.		Sub-Total			\$9,671,509		\$12,990,863	<b>\$3,319,354</b>		\$12,990,863	<b>\$3,319,354</b>	
59.	<b>SE-C</b>	<b>Seasonal Rate - Commercial</b>										
60.		No. of Bills - Summer	106	\$58.00	\$6,148	\$77.90	\$8,257	34.31%	\$58.00	\$6,148	0.00%	
61.		No. of Bills - Winter	143	\$25.00	\$3,575	\$33.58	\$4,802	34.32%	\$25.00	\$3,575	0.00%	
63.		Winter Ccf - Delivery	282,300	\$0.3813	\$107,641	\$0.5121	\$144,566	34.30%	\$0.5239	\$147,902	37.40%	
66.		Sub-Total			\$117,364		\$157,625	<b>\$40,261</b>		\$157,625	<b>\$40,261</b>	
68.	<b>L</b>	<b>Lighting</b>	276	\$19.00	\$31,464	\$25.52	\$42,261	<b>\$10,797</b>	\$25.52	\$42,261	<b>\$10,797</b>	
70.												
<b>TOTAL</b>					<b>\$106,936,834</b>			<b>\$36,696,948</b>			<b>\$36,696,948</b>	

Note Data in columns a to e from Exhibit GMP-7, pages 2 and 3.  
 Delivery charges in column g = (revenue requirements - customer charge revenues)/ proforma delivery units in ccf