BEFORE THE

RÉGIE DE L'ÉNERGIE

IN THE MATTER OF:

HYDRO QUÉBEC DISTRIBUTION

Demande relative à l'établissement des tarifs d'électricité pour l'année tarifaire 2005-2006

DOSSIER R-3541-2004

Prepared Evidence of:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, Massachusetts

On Behalf of:

l'Association québécoise des consommateurs industriels d'électricité (AQCIE)

Conseil de l'industrie forestière du Québec (CIFQ)

22 November 2004

1. Introduction and Summary of Conclusions

Industrial Economics, Incorporated (IEc) was retained by l'Association québécoise des consommateurs industriels d'électricité (AQCIE) and the Conseil de l'industrie forestière du Québec (CIFQ) to review the filing of Hydro Québec Distribution (HQD) regarding its proposals for the allocation of post-patrimonial energy costs, and for establishing a deferral account for all net generation cost variances. In particular, IEc was asked to evaluate the possibility of allocating post-patrimonial energy costs and variances on an incremental rather than rolled-in basis.

Based on our review, IEc concludes:

- Incremental allocation methods for post-patrimonial energy costs are not consistent with cost causation, with basic principles of fairness, or with significant regulatory precedents, and would likely result in complex and contentious allocation analyses. HQD's proposal to allocate generation costs on a rolled-in basis should be approved.

- While the current method for allocating patrimonial energy is not fully consistent with economic cost causation, it has been specified by the legislature and approved by the Régie. In that context, it is reasonable to apply the same methodology to post-patrimonial energy costs.

- HQD's proposal to adopt a deferral account for net generation cost variances will reduce its incentives to minimize costs and will impose significant risk on ratepayers. However, we recommend that the proposal be approved on a tentative basis, with the proviso that the deferral account be subject to a thorough prudence review at the time it is rolled into rates.

This evidence has been prepared by and under the direction of Mr. Robert D. Knecht of IEc. Mr. Knecht's *curriculum vitae* and a schedule of his expert testimony in regulatory proceedings are attached to this evidence as Exhibit IEc-1.

2. Allocation of Post-Patrimonial Energy Costs

a. Rolled-In Versus Incremental Cost Allocation Methodologies

With the forecast increase of domestic electricity demand above that provided for in the heritage pool, HQD faces the issue of how to allocate generation costs. Heritage pool generation costs are allocated pursuant to a methodology that is implicitly specified in the legislation, and which has been approved by the Régie.[1] The average generation rates for heritage pool energy are substantially below the current market prices for generation. HQD estimates the current retail market prices for power at $80.6 per MWh, compared to the legislated average rate for heritage pool energy of $27.7 per MWh. Thus, the growth in domestic load will cause HQD to incur *incremental* generating costs that far exceed *average* generating costs.

This economic situation has numerous precedents in regulatory economics. For example, in the 1970s and 1980s, new generating plants (particularly nuclear plants) provided power at substantially higher cost than existing generation plants. More recently, expansions of the electricity or gas transmission grids are more costly than existing assets per unit of demand, and cause average costs to increase.

Under these circumstances, the temptation, particularly for parties who represent existing customers, is to advocate the use of *incremental* cost allocation approaches. In an incremental approach, the high costs of the new power supplies are somehow allocated only to the new customers or to growing loads. The alternative methodology is to allocate all of the generating costs to all loads, regardless of their status as "old" or "new." This latter approach can be described as *rolled-in* cost allocation.

In our review of the relative attractiveness of these options for HQD, IEc considered the issues of cost causation, fairness, stability, simplicity, and regulatory precedent.[2] The object of this exercise is, in essence, to determine how the enormous benefit of the low-cost heritage pool should be shared among ratepayers.[3]

[1] Régie de l'Énergie, Décision D-2002-221, R-3477-2001, 21 October 2002.

[2] This list comprises the relevant characteristics of a sound rate structure, as outlined by Bonbright, et al. See, Principles of Public Utility Rates, Second Edition, Bonbright, Danielsen, Kamerschen, 1988, at 383-384.

[3] At a discount to market of $53 per MWh ($80.6 per MWh less $27.67 per MWh) and a heritage pool of 166.4 TWh per year, the value of the heritage pool is over $8,800 million per year. See HQD-12, Document 1 for adjustments to heritage pool volumes and costs associated with reduction in loss factor.

b. Cost Causation

Cost causation is generally regarded as the most important criteria for selecting a cost allocation methodology. As NARUC indicates:

> *"Cost analysts must devise methods to equitably allocate these costs among all customer classes such that the share of cost responsibility borne by each class approximates the costs imposed on the utility by that class."*[4]

While it may be tempting to blame new customers for energy demand that exceeds the limits of the heritage pool, it is simply wrong to conclude that "new load" is any more causally responsible than "old load" for increased demand. Each customer that decides to turn up the electric heater, to put on the store lights, or to smelt an additional ton of aluminum contributes to the overall demand. An increase in load associated with a new residential subdivision is no more responsible for post-patrimonial energy than is the load from an established paper mill. The incremental costs associated with the post-patrimonial energy could be avoided by either (a) the new subdivision not being built, or (b) energy efficiency measures being implemented by the paper mill. In short, all customers contribute to the need for post-patrimonial energy.

As Professor Kahn explains in his seminal text on regulatory economics:

> *"Suppose, for example, the utility has two groups of customers, one, A, whose demand is stable, another, B whose demand is increasing. And suppose expansion of the latter demand finally requires expansion of capacity. Does that mean, following our rules of peak responsibility pricing, that B are the marginal buyers on whom capacity costs alone should be imposed? Obviously not. True, it is the increase in B's purchases that precipitates the additional investment; but the additional costs could just as well be saved if A reduced their purchases as if B refrained from increasing theirs. So A's continuing to take service is just as responsible, in proportion to the amount they take, for the need to expand investment as B's increasing needs, and A should therefore be forced just as much as B to weigh the marginal benefits of the capacity to them against the marginal costs they impose on society by continuing to make demands. This reasoning clearly applies even when incremental investment costs per unit of capacity are rising and where, again, it might appear on first consideration that since it is the expansion of the B demands that it is responsible for the supplier's incurring the higher costs, it is that group that ought to bear the additional burden. Even though B's demand is 'marginal' in the temporal sense, both groups are marginal*

[4] "Electric Utility Cost Allocation Manual," National Association of Regulatory Utility Commissioners, January 1992, page 33.

in the economic sense. Both should be forced to match those higher capacity costs against the satisfaction they derive from continuing to use the service.[5]

Therefore, the cost causation principle dictates that a rolled-in cost allocation method should be adopted in the circumstances facing HQD.[6]

c. Fairness

As noted above, the key implication of the generation cost allocation methodology chosen is how the economic benefits of the heritage pool are shared between customer classes and between customers themselves. The implication of incremental methods of cost allocation is that existing customers are entitled to low-cost heritage pool power for all of their current loads, presumably in perpetuity, and that new loads have no such entitlement. The implication of the rolled-in method is that all customers, new and old, have an equal entitlement to the low-cost energy.

Which approach is more fair? Professor Bonbright defines fairness as avoiding "arbitrariness and capriciousness" and to ensure that "equals are treated equally" and "unequals are treated unequally."[7]

In evaluating the fairness of the methods, it is important to recognize that if energy costs are allocated to rate classes using incremental methods, it is only reasonable to pass those costs on to individual customers using the same methodology. Thus, for example, for the Rate L class, if post-patrimonial energy costs are assigned to incremental load, it is only reasonable to pass all those costs onto the industrial customers who are just starting up new facilities or who have expanded their existing facilities.

From that perspective, incremental cost allocation methods fail the fairness test. It is hard to contemplate how existing customers would be more deserving of the benefits of the patrimonial energy pool than new customers are. Both existing and new customers live and work in Québec, and both sets of customers contribute to the vitality of the economy. Moreover,

[5] The Economics of Regulation, Principles and Institutions, Kahn, Alfred E., 1988, page 140.

[6] Note that incremental pricing has its place in utility ratemaking. Consider the idea of customer contributions. When the tariff rates from a new customer are not sufficient to justify the expansion cost needed to serve that customer, utilities may impose a charge on the new customers to protect existing customers. Note, however, the key cost causation differences between the customer contribution example and the heritage pool example. For customer contributions, the new customer is the *only* user of the new facilities and is therefore causally responsible for it; in the Québec heritage pool case, all customers are using the resource and therefore all customers contribute to causation.

[7] Principles of Public Utility Rates, Second Edition, Bonbright, Danielsen, Kamerschen, 1988, at 383-384.

incremental cost methods must necessarily result in equals being treated unequally. Consider some of the fairness implications of incremental methods:

- New residential subdivisions would face higher rates than existing customers; in effect, equals are treated unequally;
- A residential customer who moves from a "grandfathered" residence to a new home may face a large increase in electric rates (unless HQD establishes complex systems for tracking individuals' eligibility);
- HQD would charge different rates to businesses that compete with each other, thereby implicitly providing a competitive advantage to existing businesses;
- By providing competitive advantages to existing businesses, HQD would implicitly discourage the replacement of older, less efficient firms by newer more efficient firms.[8]

Thus, not only do incremental methods fail the fairness test, they can create inefficient competitive advantages and disadvantages between business customers.

d. Stability and Simplicity

The criteria for sound utility rates usually emphasize the advantages that rates are reasonably stable over time, and that they are simple to develop and understand. Consider, however, the implications of incremental cost methodologies. First, HQD would need to determine exactly which customers are entitled to the low cost energy. Immediately questions arise.

- What historical period should be used for this entitlement?
- Should it be a warm winter, cold winter or average winter?
- Should it recognize extraordinary plant shutdowns or strikes?
- Should it be an economic up-cycle or down-cycle?

[8] Granting saleable entitlements to existing customers can potentially mitigate this problem. However, such an entitlement scheme would still inequitably benefit existing customers, and would require complex administrative procedures.

Even assuming that is possible to make such an allocation of entitlements, how would HQD then address a situation in which residential demand is extraordinarily high due to cold weather, but industrial demand is relatively low due to plant shutdowns? Should the excess residential demand be assigned higher rates, even if HQD does not incur post-patrimonial energy costs?

Or, to make the problem even more complex, suppose that HQD decides to maximize its use of patrimonial energy during peak winter and summer periods when prices are high, and implicitly buy post-patrimonial energy in off-peak hours and seasons.[9] Should these off-peak purchases of post-patrimonial energy apply only to users during those off-peak periods? As HQD indicates, any effort to try to match the incremental loads with the post-patrimonial supply would be extraordinarily complex.[10]

Turning to the stability criterion, incremental cost allocation has the advantage of preserving price stability for existing loads, at the expense of wildly unstable prices for new loads. As HQD details, its incremental costs per kWh of post-patrimonial load will vary significantly, depending on which resources are being used at any particular time, the fixed nature of the costs under some contracts, and the overall volume of post-patrimonial energy. Under these circumstances, it would be virtually impossible for a new customer to have any reasonable expectation of what his rates will look like more than one year out. This uncertainty and instability in rates will assuredly discourage investment in the province, in all sectors of the economy.

In short, incremental cost allocation methods will likely result in rates that are complex and unstable.

e. Regulatory Precedent

IEc generally does not advocate the use of precedent as a key factor in making cost allocation recommendations, as the precedent can often be found to support both sides of an issue. Nevertheless, the use of a rolled-in cost allocation methodology in circumstances similar to those faced by HQD is well established.

First, consider the example of the traditional regulation of generation. During the 1970s and 1980s, the capacity costs for new plants implied that new generating costs (particularly for nuclear power plants) were substantially higher than those of the existing power plants. In general, regulators rolled in the costs of the new facilities and recovered them in rates to all customers, and did not attempt to assign the high cost facilities only to new loads.

[9] HQD indicates that it has some flexibility for following such a strategy. See, for example, HQD-14, Document 5.1, item 1(e).

[10] See HQD 14, Document 1, item 31.

Second, the NEB took on this issue in a key case relating to the expansion of TransCanada Pipeline (TCPL) capacity. Specifically, some of TCPL's domestic customers were advocating that they retain entitlements to existing lower-cost capacity, and that the higher incremental costs be assigned only to new load (much of which was export load). The NEB indicated:

> *"The Board has decided that all facilities in the GH-5-89 proceedings, whether approved under section 52 or exempted under section 58 of the Act, will be rolled into TransCanada's rate base for toll purposes. With respect to future expansions, the Board did not make its finding respecting rolled-in methodology to be generic, but it expects that there would have to be a clear demonstration of radically changed circumstances before the issue of tolling methodology would warrant reexamination."* . . .
>
> *"In this regard, the Board agrees with those who submitted that the payment of tolls confers no future benefit on tollpayers beyond the provision of service. In other words, previous tollpayers have no acquired rights. Therefore, they cannot expect to be exempted from a toll increase simply because they have paid tolls in the past."* . . .
>
> *"With regard to the debate as to who caused the need for the new facilities, the Board is persuaded by the argument that it is the aggregate demand of all shippers that gives rise to the need for additional pipeline capacity."*[11]

Third, the deregulation of electricity generation in some jurisdictions, combined with the regionalization of transmission operation, have given rise to rolled-in versus incremental costing issues. In particular, regulators face the question as to whether rolled-in or incremental methodologies should be used for assigning the benefits of, or rights to, existing lower-cost transmission assets. The Alberta Energy & Utilities Board, after an extensive review of this issue, determined that a rolled-in approach was superior:

> *"The Board considers that it would be fair to charge the locational price to both new and existing customers, since both new and existing generators contribute to the congestion on congested transmission paths. The Board considers that both generators who decide to enter the market and generators who decide not to exit the market benefit from the transmission upgrade, and therefore both new and old generators should bear the supply portion of the upgrade costs."*[12]

[11] National Energy Board, Reasons for Decision, In the Matter of TransCanada PipeLines Limited, GH-5-89, November 1990, Volume 1 Tolling and Economic Feasibility.

[12] Alberta Energy and Utilities Board, Decision 2002-099: Transmission Administrator; Congestion Management Principles, Application No. 1248859, page 84.

f. The HQD Generation Cost Allocation Methodology

Having determined that a rolled-in methodology is the economically preferable option, we turn to the cost allocation methodology. HQD proposes to apply and extend the methodology that was approved by the Régie in R-3477-2001 for heritage pool energy costs. IEc prepared a report analyzing that methodology, which was subsequently filed as evidence in that proceeding. As detailed in that report, HQD's methodology is mathematically equivalent to a cost allocation process that consists of:

- Classifying total costs into energy and demand components, based on the system-wide load factor;
- Allocating energy-related costs on the basis of loss-adjusted energy consumption;
- Allocating demand-related costs on the basis of loss-adjusted peak demands, where peak demand consists of the top 300 hourly peaks during the course of the year.

As detailed in IEc's report in R-3477-2001, HQD's methodology is not fully consistent with cost causation principles, and it tends to allocate more costs to industrial rate classes than methods traditionally used by other Canadian electric utilities. For example, the load factor classification split assigns a relatively high share of generation costs to energy, compared to the historical practices of regulated Canadian utilities. Also, HQD's use of a 300-hour peak further increases the cost responsibility of large industrial customers, despite the fact that generating capacity must be retained that is sufficient to meet a single peak. In addition, the load-factor classification scheme penalizes the industrial classes for improvement in system load factor, despite the fact that improved system load factor should reduce costs for all rate classes.

In that proceeding, the Régie determined that the allocation methodology used by HQD was, for legal reasons, required by the Act. The Régie therefore approved that approach without addressing the economic or equity issues in detail. Thus, it is IEc's understanding at this stage that the HQD methodology must be applied to heritage pool costs for legal reasons. Because IEc recommends a rolled-in approach to generation cost allocation, HQD's proposal to expand the application of this methodology to all generation costs is not unreasonable. However, if the issue of overall allocation of generation costs is legally "on the table" in these proceedings, IEc respectfully reiterates support for the economic modifications to the HQD methodology that we made in the R-3477-2001 proceedings.

3. Deferral Account for Generation Costs

In its filing, HQD proposes to establish a deferral account for all net generation costs. That is, HQD will defer any difference between actual generation costs and the forecast generation costs, net of any difference in revenues. In effect, the HQD proposal will include both price and volume variances. HQD further proposes that the net variance be added to the forecast generation cost pool, and allocated to the rate classes using the generation cost allocation methodology.

HQD's primary reasons for adopting a complete deferral account are that it has no control over the variation in volume, and that the difference between the incremental revenues and incremental generation costs are significant. HQD is particularly concerned because its incremental revenues are likely to be based on average generation costs, most of which are determined by the heritage pool costs, while its incremental costs are likely to be the higher post-patrimonial costs.

As a general rule, regulators try to avoid using deferral accounts except in specific circumstances. The primary disadvantage of a deferral account is that it eliminates the incentives for the utility to attempt to minimize costs. If the utility is assured that it will recover the costs through the deferral account, it has little incentive to try to keep costs under control. In the case of HQD, such cost controls could include aggressive procurement efforts with generation suppliers, aggressive management of suppliers to insure that they meet their contractual obligations, and optimal use of the low-cost heritage pool resource. HQD's proposal eliminates any incentives that it might otherwise have to keep total generating costs down.

An additional disadvantage to deferral accounts is that they shift weather, volume and poor management risks from the utility to the ratepayer. In the case of HQD, this reduction in risk cannot be matched by any corresponding reduction in rates of return, since there are no generation assets on which HQD earns a return.[13] Thus, under HQD's proposal, the risk of weather variations, macroeconomic cycles and plant shutdowns will be borne by ratepayers rather than the utility. In effect, industrial customers will bear risks associated with climatic changes that affect residential and commercial demands, and residential customers will bear the risks associated with industrial plant closures and strikes. Of course, imposing these risks on business customers makes business planning that much more difficult, and it reduces the economic attractiveness of Québec as an investment option.

[13] Note that even in the unlikely event that such a risk shift is explicitly reflected in HQD's rate of return, large industrial customers will benefit only slightly, because industrial customers do not use the distribution assets that comprise most of HQD's rate base. Thus, industrial customers would assume significant risks in exchange for little benefit.

For those reasons, regulators generally use deferral accounts only for those costs that are out of the control of the utility, and for which the utility faces significant risks. In HQD's case, much of the volume variation is beyond its control, and HQD does face significant financial risk associated with the volume variation. Nevertheless, HQD does have significant control over the costs of post-patrimonial energy.

Finally, note that one disadvantage of rejecting HQD's proposal for a deferral account is that it will create an incentive for HQD to over-forecast costs. For example, having no deferral account for HQD could give it the incentive to present relatively optimistic forecasts for energy sales to the Régie, which would increase its net generation costs by overstating the post-patrimonial high-cost energy. Unless the Régie and the intervenors have unfettered access to all HQD's load forecasting analyses and its post-patrimonial energy contracts, it will be difficult to insure that the forecast is fair and equitable.

In light of these consideration, and recognizing that this is the first year in which significant post-patrimonial energy costs will be incurred, IEc recommends that the Régie approve the proposed deferral account for the current proceeding. However, IEc suggests that the Régie require that HQD provide a full analysis of that variance at the time the deferral amount is passed on to ratepayers, and that HQD's efforts to control costs are subject to a prudence review at that time.

Evidence Prepared By and Under the Direction of:

Robert D. Knecht

1 November 2004

Date

EXHIBIT IEc-1

CURRICULUM VITAE AND EXPERT TESTIMONY SCHEDULE

ROBERT D. KNECHT

ROBERT D. KNECHT

Robert D. Knecht specializes in the practical application of economics, finance and management theory to issues facing public and private sector clients. Mr. Knecht has more than twenty years of consulting experience, focusing primarily on the energy, metals, and mining industries. He has consulted to industry, law firms, and government clients, both in the U.S. and internationally. He has participated in strategic and business planning studies, project evaluations, litigation and regulatory proceedings and policy analyses. As Treasurer of IEc, Mr. Knecht is responsible for the firm's accounting, finance and tax planning, as well as administration of the firm's retirement plans. Mr. Knecht's recent consulting assignments include the following projects:

- For the Pennsylvania Office of Small Business Advocate, Mr. Knecht provides analysis and expert testimony in industry restructuring, base rates and purchased energy cost proceedings involving electric, steam and natural gas distribution utilities. Mr. Knecht has analyzed the economics and financial issues of electric industry restructuring, stranded cost determination, industry economics, cost allocation methods and rate design issues.

- For the New Jersey Board of Public Utilities, Mr. Knecht audited the cost and rate unbundling, cost allocation and rate design aspects of the industry restructuring filing of an investor-owned electric utility.

- For the U.S. Department of Justice, Mr. Knecht participated in an evaluation of the economic damage claims of a large forest products concern, in a breach of contract lawsuit. Mr. Knecht's analysis included a review of the economic claims of the plaintiff, and an evaluation of settlement alternatives.

- For the Independent Power Producers Society of Alberta and the Senior Petroleum Producers Association, Mr. Knecht provides analysis and recommendations regarding electric industry restructuring strategies. Mr. Knecht also provided expert testimony with respect to industry restructuring, cost allocation, rate unbundling methodologies and rate design.

- For a major South American iron ore mining company, Mr. Knecht assembled and managed an international team of consultants to review and evaluate the company's strategic plan. Mr. Knecht oversaw the development of recommendations in the areas of markets, the resource base, development of the resource, processing operations and finance.

Mr. Knecht holds a M.S. in Management from the Sloan School of Management at M.I.T., with concentrations in applied economics and finance. He also holds a B.S. in Economics from M.I.T. Prior to joining Industrial Economics as a principal in 1989, Mr. Knecht worked for seven years as an economic and management consultant at Marshall Bartlett, Incorporated. He also worked for two years as an economist in the Energy Group of Data Resources, Incorporated.

ROBERT D. KNECHT

Regulatory Economics

- Mr. Knecht consults and provides expert testimony in the field of regulatory economics, focusing primarily on issues of industry restructuring, cost allocation and rate design. His clients include both utilities and the consumers, competitors, and regulators of public utilities. Representative assignments are listed below.
- For the Independent Power Producers Society of Alberta and the Senior Petroleum Producers Association, in a variety of regulatory proceedings, analysis and expert testimony regarding electric industry restructuring, market power mitigation, stranded cost determination, cost allocation, rate unbundling and tariff design for transmission and distribution utilities.
- Participation in an audit of the electric industry restructuring filing of the Atlantic City Electric Company, for the NJ Board of Public Utilities, evaluating the company's rate unbundling filing.
- For the Pennsylvania OSBA, evaluation of all aspects of the electric industry restructuring filings of Pennsylvania Power & Light and West Penn Power, focusing on impacts to customers in general and small businesses in particular.
- Analysis and expert testimony regarding system expansion and related customer contribution requirements of Centra Gas Manitoba, for a large industrial customer.
- For the Industrial Gas Users Association, analysis and expert testimony of the cost unbundling methods of Gaz Metropolitain.
- Analysis and expert testimony of cost allocation and rate design practices of the three major Ontario natural gas distribution utilities over several years, on behalf of the Ontario Energy Board staff and the Canadian Independent Gas Marketing Association.
- Cost allocation and rate design study and expert testimony for a small Ontario gas distribution utility.
- Analysis and litigation support regarding accounting, financial and capacity planning procedures of New Brunswick Power Corporation, and presentation of expert testimony on cost allocation and rate design, in a series of generic regulatory hearings, on behalf of a group of large industrial customers.
- Analysis of the cost allocation and rate design procedures of Consumers' Gas, Ltd., for the Canadian Independent Gas Marketing Association.
- Analysis of the cost allocation and rate design procedures of the three major Ontario natural gas utilities, for the staff of the Ontario Energy Board.
- Economic analysis and modeling of U.S. Postal Service proposals for allocation of peak load labor and equipment costs in 1987 and 1990, for the American Newspaper Publishers Association.
- Evaluation of the cost allocation and cost recovery procedures of a domestic telecommunications firm providing aircraft to ground data communications.
- Assessment of alternative methodologies for defining the electric rate classes of Maritime Electric Corporation, for the Prince Edward Island Ministry of Energy and Forestry.

Regulatory Economics (continued)

- Evaluation of the cost allocation and rate design procedures of the Nova Scotia Power Corporation, for a group of interruptible electricity consumers, and in a later proceeding, for a large industrial customer.
- Assessment of a proposed class-specific, risk-adjusted rate of return methodology for natural gas distribution utilities, for the staff of the Ontario Energy Board.
- Preparation of rebuttal analysis regarding management prudence in the construction of the River Bend Nuclear Generating Station, for Gulf States Utilities.

Economic Consulting

- Mr. Knecht's practice includes the application of economics, finance and decision analysis theory to practical problems facing businesses, law firms and government. His assignments include industry and company planning, market forecasting, policy analysis and economic damage assessment. Representative assignments are listed below.
- For the US Department of Justice Civil Division, analysis of economic damages and participation in settlement negotiations associated with alleged breach of contract involving long-term timber supply contracts between the U.S. government and a large forest products company in Southeast Alaska.
- For the Electric Power Research Institute, analysis and adaptation of models that compute the economic costs of environmental externalities associated with electric generating stations.
- Economic, market and cost analysis for a team of international consultants preparing a restructuring study of the Polish steel industry, in conjunction with the World Bank.
- Economic and policy analysis for a U.S. engineering firm preparing a strategic planning study for the state-owned steel company in Venezuela.
- For the U.S. Environmental Protection Agency, evaluation of the impact of Clean Air Act amendments on major industrial facilities that are closing or are threatened with closure.
- Econometric analysis of world steel consumption patterns for a major international iron ore producer.
- Litigation support services relating to the business planning activities of a major West Coast construction and fabrication concern, in a fraudulent conveyance lawsuit.
- Review and analysis of direct and rebuttal evidence regarding economic damages to recreational activities, for the U.S. Department of Justice.
- Decision analysis and calculation of economic damages in an ERISA discrimination lawsuit, for a major domestic manufacturing company.
- Financial, econometric and strategic planning analyses for an international engineering firm, engaged in the preparation of a strategic plan for the steel industry of Nigeria.

Economic Consulting (continued)

- Economic analysis and econometric modeling of import behavior in the domestic carbon steel and wire rope markets, for hearings before the U.S. International Trade Commission.
- Financial analysis and damage assessment for a major domestic law firm, in support of a major anti-trust suit involving the potential construction of a coal slurry pipeline.
- Economic analysis of imports of iron ore pellets into the U.S., for a major international iron ore producer.
- Construction of an economic model of domestic metallurgical coke demand, for the U.S. Environmental Protection Agency.
- Econometric analysis of energy demand, by energy type, region and sector, and management of a sectoral supply-demand model of energy production and use.

Management Consulting

Mr. Knecht has also provided management consulting services to various basic industrial clients, focusing primarily on planning and decision-making. Representative assignments are listed below.

- Competitive dynamics analysis of the world iron ore industry and preparation of strategic recommendations for a major South American mining company.
- Task leader in a management audit of a New Jersey natural gas local distribution company.
- Development of a strategic plan and various business plans for a domestic specialized producer of carbon and alloy steel bars.
- Economic analysis and financial modeling of labor and employee benefits costs for a large integrated steel producer. Preparation of recommendations for labor relations and bargaining strategies.
- Analysis for the restructuring of the marketing function of a large domestic manufacturing company, including market segmentation analysis, field interviews and competitor comparisons.
- Market survey and analysis of the domestic hot finished seamless steel tube markets, for a U.S. producer.
- Strategic and business plan development for a major Polish steel producer.

ROBERT D. KNECHT

EXPERT TESTIMONY SUBMITTED IN UTILITY REGULATORY PROCEEDINGS

Docket #	Regulator	Utility	Date of Testimony	Client	Topic of Testimony
R-049255	Pennsylvania Public Utility Commission	PPL Electric Utilities Corporation	June 2004	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design, automatic distribution increases.
P-042090 et al.	Pennsylvania Public Utility Commission	Philadelphia Gas Works	June 2004	Pennsylvania Office of Small Business Advocate	Collections and universal service cost issues.
RP-2003-0203	Ontario Energy Board	Enbridge Gas Distribution	May 2004	Vulnerable Energy Consumers Coalition et al.	Cost allocation, rate design for pipeline and storage costs
R-049157 P-042090	Pennsylvania Public Utility Commission	Philadelphia Gas Works	April 2004	Pennsylvania Office of Small Business Advocate	Cash receipts reconciliation clause
R-049108	Pennsylvania Public Utility Commission	National Fuel Gas Distribution	March 2004	Pennsylvania Office of Small Business Advocate	Uncollectible cost responsibility for standby charges
Application 1306819	Alberta Energy and Utilities Board	ENMAX Power Corporation	January 2004	Calgary Industrial Group Calgary Building Owners	T&D cost allocation, rate design, ratepayer equity funding
R-3492-2002 Phase 2	Régie de l'Énergie, Québec	Hydro Québec Distribution	November 2003	AQCIE, CIFQ	Rate policy, cross-subsidization
R-038168	Pennsylvania Public Utility Commission	National Fuel Gas Distribution	July 2003	Pennsylvania Office of Small Business Advocate	Cost allocation, deficiency assignment, rate design
R-3492-2002 Phase 1	Régie de l'Énergie, Québec	Hydro Québec Distribution	January 2003	AQCIE, AIFQ	Cost allocation; maintenance of historical cross-subsidization
M-021612	Pennsylvania Public Utility Commission	Philadelphia Gas Works	September 2002	Pennsylvania Office of Small Business Advocate	Natural gas restructuring, cost allocation, rate unbundling
R-027385	Pennsylvania Public Utility Commission	PG Energy (Southern Union)	July 2002	Pennsylvania Office of Small Business Advocate	Purchased gas cost incentive mechanisms.

ROBERT D. KNECHT

EXPERT TESTIMONY SUBMITTED IN UTILITY REGULATORY PROCEEDINGS

Docket #	Regulator	Utility	Date of Testimony	Client	Topic of Testimony
1250932	Alberta Energy and Utilities Board	Aquila Networks Canada (Alberta) Ltd.	July 2002	Senior Petroleum Producers Association	Distribution plant and cost allocation, rate design.
R-027204	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	May 2002	Pennsylvania Office of Small Business Advocate	Purchased gas cost incentive mechanisms, rate design
R-3477-2001	Régie de l'Énergie, Québec	Hydro Québec Distribution	May 2002	AQCIE, AIFQ	Classification/allocation of generation costs, subject to constant unit cost constraint.
1248859	Alberta Energy and Utilities Board	ESBI Alberta Limited	March 2002	IPPSA	Transmission congestion management principles
R-016378	Pennsylvania Public Utility Commission	Philadelphia Gas Works	August 2001	Pennsylvania Office of Small Business Advocate	Cost of gas; commodity price forecasting
R-016179	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	May 2001	Pennsylvania Office of Small Business Advocate	Recovery of CAP costs; PGC treatment of pipeline credits
R-005277	Pennsylvania Public Utility Commission	PFG Gas Inc. and North Penn Gas Company	November 2000	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design.
R-3443-2000	Régie de l'Énergie, Québec	Société en commandite Gaz Métropolitain	November 2000	Industrial Gas Users Association (ACIG)	Tariff unbundling
990005	Alberta Energy and Utilities Board	ESBI Alberta Limited	November 2000	IPPSA	Location-based credits for transmission rates
R-005119	Pennsylvania Public Utility Commission	PG Energy (Southern Union)	July 2000	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design, weather normalization

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EXPERT TESTIMONY SUBMITTED IN UTILITY REGULATORY PROCEEDINGS

Docket #	Regulator	Utility	Date of Testimony	Client	Topic of Testimony
R-994788	Pennsylvania Public Utility Commission	PFG Gas, Inc. and North Penn Gas Company	February 2000	Pennsylvania Office of Small Business Advocate	Natural gas restructuring, retail access, tariff design
R-994785	Pennsylvania Public Utility Commission	National Fuel Gas Distribution Corp.	December 1999	Pennsylvania Office of Small Business Advocate	Natural gas restructuring, retail access, tariff design
R-994783	Pennsylvania Public Utility Commission	PG Energy, Inc.	November 1999	Pennsylvania Office of Small Business Advocate	Natural gas restructuring, retail access, tariff design
99005	Alberta Energy and Utilities Board	ESBI Alberta Limited (Transmission Administrator)	September 1999	IPPSA	Transmission tariff cost allocation, rate design, industry restructuring
RE95080	Alberta Energy and Utilities Board	Alberta Power Limited	December 1998	Independent Power Producers Society of Alberta and SPPA	Electric industry restructuring, rate unbundling, cost allocation and rate design.
RE95081	Alberta Energy and Utilities Board	TransAlta Utilities Corporation	November 1998	IPPSA and Senior Petroleum Producers Assn.	Industry restructuring, cost allocation, rate design.
Expansion Feasibility Test	Public Utilities Board of Manitoba	Centra Gas Manitoba	August 1998	Simplot Canada Limited	Expansion feasibility and customer contribution methodology
R-984280	Pennsylvania Public Utility Commission	PG Energy, Inc.	August 1998	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue deficiency assignment, rate design
EO97070455	New Jersey Board of Public Utilities	Atlantic City Electric Company	February 1998	New Jersey Board of Public Utilities	Industry restructuring, audit of unbundled rates
R-973981	Pennsylvania Public Utility Commission	Allegheny Power (West Penn Power)	January 1998	Pennsylvania Office of Small Business Advocate	Industry restructuring, cost unbunding, cost allocation, and rate design.

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R-973954	Pennsylvania Public Utility Commission	Pennsylvania Power & Light	August 1997	Pennsylvania Office of Small Business Advocate	Restructuring, stranded costs, market price forecasting, cost allocation, and rate design.
1996 Electric Utility Tariff Applications	Alberta Energy & Utilities Board	TransAlta Utilities, Alberta Power Edmonton Power, Grid Company of Alberta	October 1996	Independent Power Producers Society of Alberta (IPPSA)	Industry restructuring; transmission cost allocation and rate design.
R-963612	Pennsylvania Public Utility Commission	PG Energy, Inc.	October 1996	Pennsylvania Office of Small Business Advocate	Cost allocation and rate design -- direct and rebuttal.
R-953444	Pennsylvania Public Utility Commission	Trigen-Philadelphia Energy Corp.	November 1995	Pennsylvania Office of Small Business Advocate	Steam energy cost rate -- direct and rebuttal.
R-953406	Pennsylvania Public Utility Commission	T.W. Phillips Gas & Oil Company	October 1995	Pennsylvania Office of Small Business Advocate	Weather normalization, cost allocation and rate design.
R-953297	Pennsylvania Public Utility Commission	UGI Utilities, Inc. (Gas Division)	May 1995	Pennsylvania Office of Small Business Advocate	Cost allocation and rate design -- direct and surrebuttal.
R-943271	Pennsylvania Public Utility Commission	Pennsylvania Power & Light	April/May 1995	Pennsylvania Office of Small Business Advocate	Cost allocation and rate design -- direct and rebuttal
EBRO 488	Ontario Energy Board	Natural Resource Gas Limited	November 1994	Natural Resource Gas Limited	Customer classification, cost allocation and rate design.
RE92071	Alberta Public Utilities Board	Alberta Power Limited	November 1994	Independent Power Producers Society of Alberta	Cost allocation and rate design for export transmission service.
R-942986	Pennsylvania Public Utility Commission	West Penn Power Company	August 1994	Pennsylvania Office of Small Business Advocate	Cost allocation and rate design.

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Docket #	Regulator	Utility	Date of Testimony	Client	Topic of Testimony
R-932862	Pennsylvania Public Utility Commission	UGI Utilities, Inc. (Electric Division)	March 1994	Pennsylvania Office of Small Business Advocate	Cost allocation and rate design -- direct, rebuttal and surrebuttal.
EBRO 485, and Generic Direct Purchase Hearings	Ontario Energy Board	Consumers' Gas Company, Ltd.	August 1993, September 1993.	Canadian Independent Gas Marketing Association	Classification and allocation of marketing and administrative costs.
Hearings for Cost of Service and Rate Design	Nova Scotia Utility and Review Board	Nova Scotia Power, Inc.	May 1993	Bowater Mersey Paper Company, Ltd.	Classification of bulk power costs, rate design for interruptible service and other rate design issues.
Generic Hearing #4	Board of Commissioners of Public Utilities, Province of New Brunswick	New Brunswick Power Corporation	November 1991	Large Power Users Group	Review of cost allocation and rate design.
EBRO-473	Ontario Energy Board	Consumers' Gas Company, Ltd.	October 1991	Ontario Energy Board Staff	Cost allocation and rate design
EBRO-470	Ontario Energy Board	Union Gas, Ltd.	February 1991	Ontario Energy Board Staff	Cost allocation and rate design; evaluation of load shifting study.
Rate Area Boundaries Hearings	Prince Edward Island Public Utilities Commission	Maritime Electric Co., Ltd.	February 1991	Prince Edward Island Department of Energy and Forestry	Customer classification by geographical area.
EBRO-467	Ontario Energy Board	Centra Gas, Ltd.	January 1991	Ontario Energy Board Staff	Cost allocation and rate design for technology, cogen and bypass.
Arbitration Hearings	Arbitrator	ARINC, Inc.	July 1990	ARINC Inc.	Cost allocation and rate design for aircraft to ground data communications service.

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Docket #	Regulator	Utility	Date of Testimony	Client	Topic of Testimony
EBRO-462	Ontario Energy Board	Union Gas, Ltd.	January 1990	Ontario Energy Board Staff	Seasonal cost allocation study, and allocation of costs to export markets.
NSPC-857	Nova Scotia Board of Commissioners of Public Utilities	Nova Scotia Power Corp.	February 1989	Interruptible industrial customers	Cost allocation and rate design of interruptible electric service.

June 2004