Charles J. Cicchetti, Ph.D.
Jeffrey A. Dubin, Ph.D.
Blaine Gilles, Ph.D.
Lawrence R. Kaufmann, Ph.D.
Colin M. Long, J.D.
Mark N. Lowry, Ph.D.

Pacific Economics Group Research, LLC

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Guy Sarault,
Bissonnette Fortin Giroux
490 Laviolette
St-Jérôme, Qc
Canada J7Y-2T9

Hi Guy,

This letter revises the proposal that I sent you on July 8 to assist AQCIE, CIFQ, and possibly other Quebec consumer groups in Phase I of the Régie's proceeding on the méchanisme de réglementation incitative ["I*ncentive Regulation*" ("IR")] for Hydro Quebec Distribution ("HQD") and Trans-Energie ("HQT"). The revisions are in response to our conversation of Thursday July 16th following your meeting with other Quebec intervenors. I begin with a general introduction to IR and then discuss likely issues in the upcoming proceeding. There follow discussions of our credentials to provide expert advice and testimony and a project proposal.

Introduction to IR

IR is an approach to utility regulation that is expressly designed to strengthen utility performance incentives. Salient approaches to IR include the following :

Incentivized Cost Trackers

Cost trackers are commonly employed in traditional regulation to address costs of fuel, purchased power, and conservation and demand management ("CDM") programs. They are occasionally used to address rapidly rising costs like those of capital expenditure ("capex") surges. Incentives to contain tracked costs can be strengthened by permitting only a partial true up of revenue, when it is initially based on forecasts of tracked costs, to actual costs.

Relaxed Earnings/Use Link

Relaxing the link between earnings and system use reduces a utility's disincentive to promote conservation and demand management ("CDM") when rates feature the high usage charges that encourage CDM. Two kinds of mechanisms are commonly used to accomplish this: revenue decoupling and lost revenue adjustment mechanisms ("LRAMs"). Decoupling can in principle apply to some services and LRAMs to others.

Performance Metric Systems

Performance metrics (known as "outputs" in Britain) are used to quantify utility performance in areas that matter to customers and the public. A utility's performance can be measured by comparing a utility's value for a metric to a target value. Award/penalty mechanisms ("APMs"), targeted performance incentive mechanisms ("PIMs") adjust revenue automatically on the basis of such performance evaluations. In the regulation of US electric utilities, PIMs are most widely used to strengthen incentives for utilities to aggressively promote CDM.

Multiyear Rate Plans

The Basic Idea

Multi-year rate plans ("MRPs", called "price controls" in Britain) are the most common approach to IR around the world. These plans typically involve rate case moratoria for 3 or more years. Attrition relief mechanisms ("ARMs") provide predictable, automatic escalation of rates or allowed revenue between rate cases. MRPs with *revenue* cap ARMs also typically feature revenue decoupling. Cost trackers ("Y factors") permit certain costs to be separately addressed, using more traditional cost of service methods, when the costs are difficult to address using ARMs. Costs that are tracked in MRPs typically include those for fuel, purchased power, and CDM but may also include costs of capital expenditure ("capex") surges. Earnings sharing mechanisms ("ESMs") are sometimes added to MRPs to share plan benefits and reduce the likelihood of extreme earnings outcomes. Efficiency carryover mechanisms permit utilities to keep a share of long term performance gains --- and absorb a share of inefficiencies --- between plans. MRPs also sometimes afford utilities marketing flexibility that is substantially greater than that under traditional regulation. This flexibility can be especially useful in providing large industrial customers with market-responsive rates and services.

APMs are frequently added to MRPs to ensure that the incentive for cost containment is balanced by incentives to pursue other goals that matter to customers and the public. Most commonly, APMs are added to address reliability, customer service quality, and CDM programs.

ARM Design

The ARM is usually the chief focus of proceedings to approve MRPs.

ARM Design Approaches

Several approaches to ARM design are well-established and all merit consideration in IR plans for HQ. The approaches are varied, so that virtually any cost trajectory can be addressed.

North American Indexing: An index-based approach to ARM design has developed in North America that utilizes estimates of industry cost trends. It is customary to separately consider input price and productivity trends. One possible formula for HQD is

$$\textit{Growth Revenue /Customer} = \textit{Inflation} - X \qquad [1]$$

In a classic North American ARM, the X factor is designed to guarantee customers the benefits of the industry's productivity growth trend plus a "stretch factor" that shares the benefits of accelerated productivity growth under the stronger performance incentives created by the plan. The calculation of stretch factors is sometimes informed by statistical benchmarking studies of the subject utility's cost performance relative to the industry.

Index-based ARMs are sometimes combined with tracker treatment of capital spending ("capex") surges. Where this is permitted, cost trackers can be a major issue in plan design. Capital trackers were the subject of a second phase proceeding in a recent Alberta PBR initiative. The streamlining and incentivization of capital trackers is a major goal of the Alberta Utilities Commission in its upcoming generic proceeding on second-generation IR. In Ontario, utilities have the option to file for supplemental capital tracker revenue, and many have done so.

The indexing approach to ARM design originated in the United States but is used more widely today in Canada (e.g., Ontario, Alberta, & British Columbia) and in countries overseas that include New Zealand. For example, Gazifère has operated

under index-based ARMs for many years. Gaz Métro has been directed by the Régie to operate under a formula like going forward. Index-based ARMs have also been used in New Zealand for nearly a decade. The Australian Energy Regulator is very interested in the North American approach but is waiting for an accumulation of the necessary data from its jurisdictional power distributors.

The industry productivity trend is a controversial issue in proceedings that consider index-based ARMs. In the United States, where IR proposals are frequently rejected by regulators, utilities are commonly content to acknowledge gradual industry productivity growth and the reasonableness of positive X factors. In Canada, utilities have usually argued for *negative* productivity trends *but have seldom won this battle*. The long-term power distribution productivity trend in the US has been positive. The trend in Ontario has been close to zero but the true trend is unclear due to data problems that include a change in accounting standards.

Forecasting: ARMs can, alternatively, have "stair step" trajectories based on multiyear forecasts of the *total* cost of service. In the United States, this approach is currently used only in New York. In Ontario, utilities are permitted to propose "custom" IR plans with revenue requirements based on multiyear cost forecasts. In Britain, power distributors operate under revenue cap ARMs escalated by indexes that are calibrated to reflect multiyear cost forecasts. This has been called a "building blocks" approach to ARM design because numerous cost categories must be separately considered.

Hybrids: Hybrid ARMs combine indexing and forecasts. In California, for example, ARMs have often featured indexing for operation and maintenance ("O&M") expenses and stair steps for capital cost. This approach to ARM design reduces regulatory cost by limiting the array of costs that must be forecasted. British Columbia has another kind of hybrid that features involves separate indexation of O&M expenses and capex.

Tracker/Freeze: A "tracker/freeze" approach to ARM design combines a multiyear rate freeze with trackers for rapidly rising costs like those for major plant additions. This approach is used by a number of large vertically integrated electric utilities in the United States (e.g., Florida Power & Light) and merits consideration in the regulation of HQT.

Incentive Compatible Menus

Utilities can be offered "incentive-compatible" menus of MRP provisions which incentivize utilities to reveal their cost expectations through their choices.

- This approach has been discussed in the academic regulatory economics literature since the 1980s. The major theoretical contributions have been made

Michael Crew (Rutgers University) and Paul Kleindorfer [University of Pennsylvania (deceased)], and Jean Tirole (Toulouse School of Economics).

- Menus can be applied to both forecast-based and index-based approaches to ARM design. In the context of an index based ARM, for example, the utility might be presented with various combinations of X factors and earnings-sharing mechanisms or capital cost trackers.
- In the United States, a menu approach with alternative combinations of X factors and earnings sharing was used in the early 1990s by the Federal Communications Commission to regulate interexchange access services of local telecommunications exchange carriers.
- In Britain, menus have in recent years been used by Ofgem to regulate energy and water utilities.

The Forecasting Challenge

Utilities have a strong incentive to exaggerate their future costs when regulators ponder ARM design. This can lead to overly generous ARMs or supplemental capital tracker budgets. There is a material risk of regulatory capture that denies consumers a fair share of IR plan benefits.

Exaggeration of cost growth has been especially conspicuous in Britain. The British regulator Ofgem has responded by spending large sums on statistical benchmarking and engineering consultants to strengthen its ability to forecast efficient cost. A rate case under the current "RIIO" approach to MRP design in Britain can take three years if the utility's revenue proposal is controversial.

The efficient cost of service in year t+1 can be decomposed as follows:

$$Cost_{t+1}^{Efficient} = Cost_t^{Actual} \times (Cost_t^{Efficient} / Cost_t^{Actual}) \times (Cost_{t+1}^{Efficient} / Cost_t^{Efficient}). \quad [2]$$

Thus, the efficient cost depends on both a utility's current *level* of inefficiency and on the *growth* in efficient cost over time. Cost growth depends on the growth of input prices, operating scale, and productivity. This analysis helps to explain why statistical benchmarking of a utility's recent cost level and statistical research on industry input price and productivity trends are *both* useful in ensuring that an ARM provides benefits to customers.

Benchmarking and productivity research are used extensively by regulators that use forecasted ARMs. Britain's regulator also makes extensive use of engineering consultants. In Australia, the nation's largest power distributor, Ausgrid, a public enterprise, was recently subject to a large revenue disallowance based on the results of

a statistical benchmarking study. In Ontario, utilities proposing custom IR plans are required to base their proposals on benchmarking and productivity evidence.

In recent years, Ofgem has used an "Information Quality Incentive" involving incentive-compatible menus to encourage utilities to provide more reasonable cost forecasts. It is relatively easy to design an incentive compatible menu that encourages a utility to reveal its expectation about future costs. The hard part is to make sure that the menu affords customers a fair share of the benefit of efficient operation. Statistical cost and engineering research is useful in designing menus that ensure customer benefits. *Engineering and statistical cost research are thus a complement rather than a substitute for a menu-based approach to ARM design which benefits customers.*

MRP Precedents

MRPs were first used extensively in North America in the railroad, telecommunications, and oil pipeline industries. MRPs have helped utilities in those industries obtain the marketing flexibility they need to serve a mix of competitive and non-competitive markets from a single set of assets. In the energy industry, MRPs are well established (though far from ubiquitous) in the United States for electric utilities. Long time practitioners include the regulatory commissions of Maine, Massachusetts, New York and California. There is growing interest in the MRP approach by vertically integrated electric utilities ("VIEUs"). Minneapolis-based Xcel Energy, for instance, has requested or plans to request MRPs in all of the states in which it operates.

Power transmission services in the United States are chiefly regulated by the FERC. They typically use a "formula rate" approach to regulation that resembles "cost plus" regulation. This has encouraged high levels of capex in a period in which it has been deemed necessary to support development of regional bulk power markets. IR would be costly to apply to the more than 100 transmission owners that the FERC regulates given the need there would be for customization of IR plans during this transitional period.

In Canada, MRPs are becoming mandatory for energy distribution in most of the populous provinces. However, transmission services have been regulated almost entirely using COSR. Overseas, MRPs are the norm for power transmission and distribution in Britain, Australia, and most other advanced industrial countries.

- **Special Circumstances in Québec**

Special circumstances in Québec merit consideration in the development of IR strategies for HQD and HQT.

- Québec is a large region with a diverse economy that includes large commercial, manufacturing, natural resource, agricultural, and recreational industries. The demand of some manufacturing and natural resource (e.g., forestry) customers is sensitive to the price and other terms of service that HQ offers. Retaining their loads is important to the Quebec economy.
- In addition to the large urban area of Montreal, Québec has extensive sparsely populated regions, many of which are forested. Winter weather is severe. Some remote regions are served by power systems that are not connected to the provincial grid.
- The environmental impact of energy is an important policy consideration in Quebec. There are sizable electric CDM programs, and interest in promoting distributed generation ("DG") and electric vehicles. Utilities are incentivized to resist CDM and DG under current regulation. With frequent rate cases, the overriding incentive is to grow rate base.
- Québec and neighboring Labrador have vast remotely-located hydrologic and wind resources for power generation. Power from these resources has special value in the US and Canada given the push to reduce power industry carbon emissions. The transmission system plays a key role in bringing this power to market. Accessing unexploited resources can involve occasional high levels of capex that give the cost of transmission a pronounced "stair step" trajectory.
- HQ has been filing frequent rate cases for its T&D services, and this has weakened its performance incentives. Its public ownership may not encourage efficiency. Despite suspicions of inefficiency, its productivity trend and the efficiency of its current cost level are unknown.
- Article 48.1 of the *Loi sur la Régie de l'energie* requires the Régie to establish IR for the T&D services of HQ. Regulation must fulfill the following objectives.

    - Continual *improvement* in performance and service quality
    - Cost *reduction* that benefits both consumers and the utility
    - Streamlining of the rate setting process

An MRP with an index-based ARM with a stretch factor linked to operating efficiency, and APMs for reliability is an approach to IR that obviously satisfies these criteria.

Benchmarking and productivity trend research can help ensure customer benefits from PBR.

- The Régie decided in D-2014-033 that an approach to IR which HQ proposed which involved frequent rate cases did not meet the requirements of the law.
- The Régie instituted a public hearing to consider alternative IR approaches in June 2014. They retained a consultant (Elenchus) to prepare a white paper on IR precedents in other jurisdictions. The resulting white paper was almost entirely focused on MRPs. In May 2015, a technical conference on the Elenchus white paper was held to allow parties to better understand Elenchus' work and its possible implications for the IR plans to be developed.
    - While not offering specific recommendations in the technical conference, Elenchus stated that benchmarking "is worth considering" and that it is almost always useful.
    - Elenchus also endorsed the use of an external productivity growth standard for HQ. It would then be necessary to use data from jurisdictions outside of Quebec.

- In a 5 June document, the Régie proposed a schedule for the IR hearing. The proposal included simultaneous hearings addressing 1) general issues in the design of IR plans and 2) a multifactor productivity ("MFP") study. The Régie has not been clear on whether it is interested in a benchmarking study, productivity trend studies using HQ or external data, or "all of the above". However, its proposal suggests that the Régie considers statistical cost research to play an essential role in the design of IR plans that are consistent with the law.

- In a 30 June decision, the Régie established a tentative three-phase schedule for a proceeding to develop IR plans for HQD and HQT. Phase 1 would take place between now and April 2016 and consider characteristics and objectives of operational IR and the approaches to IR that are compatible with the law. Key concerns on which the Régie seeks input include the following.
    - Types of IR that respond to special features of transmission and distribution
    - Appropriate performance metrics
    - How to ensure that performance gains are fairly divided

  This phase will involve written evidence, data requests, and oral testimony. A possible Phase 2 would involve a multifactor productivity study. It is not clear how Phase 2 would inform IR proposals considering the Regie's proposed timeline. Consumers would benefit from getting these studies started earlier so

that they can be available in a timely manner to inform the rate cases and IR plan designs.

A budget of CAD 200,000 has been established for the services of all experts retained by intervenors in Phase 1. There is, however, no cap on the budget for HQ's consultants. Enbridge Gas Distribution paid its consultant, Concentric Energy Advisor, $2,000,000 in a recent Ontario IR proceeding.

- This budget permits little funding for candidate experts with limited experience to "learn on the job".
- There are no funds for basic research on the emerging issues in IR that have been revealed in other recent Canadian proceedings. Consultation and evidence will therefore have to rely on "off the shelf" knowledge.
- The budget may also prohibit the hiring of more than two pieces of expert testimony.

Services Required

We believe the following issues are most important in the design of MRPs for HQ's T&D services:

- Attrition Relief Mechanism
- Cost Trackers
- Relaxation of the Earnings/Usage Link
- Performance Metric System
- Earnings Sharing Mechanism
- Off Ramp Provisions
- Marketing Flexibility Provisions
- Plan Term
- Efficiency Carryover Mechanism and other Plan Termination Provisions
- Requisite statistical and engineering research

Of these provisions, the ARM and cost tracker provisions will likely be of greatest importance to consumers. A key issue is whether to use 1) a combination of an indexed ARM and cost trackers, the approach common in Alberta, British Columbia and Ontario or 2) a fully forecasted ARM, the approach used in Britain and recently permitted in Ontario. Environmental groups will have a special interest in revenue decoupling, funding for CDM programs, the accommodation of DG, and performance metrics. Industrial groups may have a special interest in marketing flexibility and utility incentives to accommodate DG.

Whichever approach to ARM design is chosen, productivity and benchmarking studies would help consumers benefit from IR and help ensure conformance with the law. They provide external performance standards for HQ and help ensure that customers receive the benefit of improving productivity. There is no reason to suppose that the productivity trends of power transmission and distribution utilities are the same given the markedly different recent histories of these industries.

US data should be included in the productivity (and any benchmarking) work since there is a large and varied sample of data in the states over many years which includes numerous companies with the attributes of Hydro Quebec. US data are especially essential in any transmission study since standardized data based on a uniform system of accounts are available for only a handful of transmission utilities in Canada. The Régie may also be interested in results using Ontario data.

A menu approach to ARM design should definitely be considered by consumers and explained to the Regie in expert testimony. However, the sizable literature on menus is clear on the fact that *this approach cannot ensure benefits for consumers in the absence of appropriate efficiency studies.* Note also that *there is no assurance that the Régie will accept a menu approach, which has never been used in North American energy utility regulation and has been explicitly rejected three times in Canada.* Accordingly, *consumers must have solid fallback options even if they prefer the use of menus*. *It would be foolish to "bet the farm" on a menu approach, much less one that is divorced from the benchmarking and productivity indexing that are needed to ensure consumer benefits.*

The form of IR that makes the most sense for HQD and HQT will likely differ. Considerable work may be needed to develop IR for HQT because there are fewer precedents in the transmission field and the Elenchus report did little to address this topic.

Experience

Overview : Pacific Economics Group ("PEG") Research LLC is a company in the Pacific Economics Group consortium that specializes in research on utilities and their regulation. The main focus of our work has been utility performance measurement and IR. We have been a leading IR consultancy for more than two decades. We invented many of the terms that are widely used in IR discussions. We monitor new developments in regulation routinely and maintain an international library of IR decisions.

Our Midwest personnel, based chiefly in Madison, Wisconsin (near Chicago), include three Ph.D. economists and have accumulated over sixty man years of experience in these fields. The University of Wisconsin-Madison ("UW") has trained most of our staff and is renowned for its economic statistics program. We periodically write articles on our research in respected professional journals. Our practice is multinational and has to date involved projects in twelve countries, including dozens of projects in Canada.

Work for a mix of utilities, regulators, and consumer groups has given us a reputation for objectivity and commitment to good regulation. In Canada, for example, we have worked for clients as diverse as Hydro One Networks, the Canadian Electricity Association, the Ontario Energy Board, and the Commercial Energy Consumers of British Columbia. In Australia we have, similarly, worked for both utilities and regulators on numerous occasions. The X factors we have proposed for Gaz Metro based on our research far exceed those which have been approved for Gazifere.

We frequently speak at conferences on IR and other topics in the area of alternative regulation ("Altreg".) In addition to chairing our own conferences, we have spoken at conferences organized by Law Seminars International, the National Association of Regulatory Utility Commissioners, the Michigan State University Institute of Public Utilities, the Financial Research Institute at the University of Missouri, the Public Utilities Research Center at the University of Florida, and the Society of Regulatory and Utility Financial Analysts. Our most recent Altreg conference in Chicago was attended by two employees of Hydro Quebec.

Multi-Year Rate Plans : *The most important criterion for choosing an expert for this proceeding is actual experience in MRP proceedings. Experience with the index-based approach to MRPs that is favored in Canada is especially desirable.* PEG Research has been North America's leading MRP consultant for decades.[1] We have produced numerous victories for our clients in MRP proceedings.[2] Our MRP services encompass plan design and statistical research on industry input price and productivity trends. We have done more productivity studies over the years than all other North American consultancies combined, and have been on the "winning side" in numerous Canadian X factor decisions.[3] Several clients have used our MRP services repeatedly.[4]

[1] Please take careful note of the experience of the other candidate experts in MRP proceedings.
[2] No competing firm can make this claim.
[3] Several Canadian utilities have wasted large sums and commission and stakeholder goodwill in a fruitless attempt to oppose estimates of gradual industry productivity growth in gas and electric power distribution which are routinely embraced by US utilities in IR proceedings.
[4] Some competitors, in contrast, have adopted such extreme positions and combative postures in MRP proceedings that they were not subsequently rehired by their clients.

MRPs for power *distribution* are a company specialty. We have also done three projects on power *transmission* MRPs (including Hydro One Networks and BC Transmission). The latter work included research on the productivity trends of US transmission utilities. This research has alerted us to idiosyncrasies of the data needed for transmission productivity studies. While work in Quebec would require updating if a transmission study is ultimately desired, we believe that no other North American consultant has experience in this field.

Award-Penalty Mechanisms: We also have extensive experience with APM design issues.

- We have testified several times on APMs for reliability and other dimensions of service quality.
- We have prepared authoritative surveys on service quality APMs for Detroit Edison and the Ontario Energy Board ("OEB").

Incentive Power Model: We have developed an incentive power model that quantifies the impact on utility performance incentives of alternative regulatory systems. A leading role in the development of this model was played by former employee Travis Johnson, a graduate of MIT and Stanford's Graduate School of Business who is now a professor at the McCombs School of Business at the University of Texas. This model has produced useful insights on plan design, including the design of efficiency carryover mechanisms.

Utility of the Future Regulation: Recent changes in power distribution and metering technology, together with the growing cost competitiveness of distributed generation and storage, have prompted several industry commentators to ponder the appropriate regulatory system for the "utility of the future". Several commentators have touted the potential value of IR. I have been a IR advisor to several recent utility of the future initiatives.

I have led a multiclient study involving some of the largest US electric utilities on utility of the future performance metrics. This project considered metrics in areas like the following:

- CDM
- DG penetration
- Connection times and other measures of DG service quality
- AMI functionality
- System Efficiency

Additionally,

- I have advised Minnesota's e21 Initiative on IR for the utility of the future.
- I have helped Powering Tomorrow devise IR strategies for the utility of the future.
- I am currently coauthoring a paper tentatively titled *PBR for a High DER Future* for the US Department of Energy's Lawrence Berkeley National Laboratory.
- I am preparing a white paper on PBR for emerging utility challenges for multiple clients.

Revenue Decoupling: PEG Research is also active in the revenue decoupling field. A long time advocate of decoupling, I have worked for diverse clients that include Commonwealth Edison, the OEB, and Rhode Island's Energy Efficiency and Resource Management Council.

Clients: PEG Research personnel have testified on IR for Atlanta Gas Light, Bangor Hydro-Electric, Bay State Gas, BC Gas, Boston Gas, Central Maine Power, Citipower, Central Vermont Public Service, the Consumers' Coalition of Alberta ("CCA"), the Commercial Energy Consumers of British Columbia, Gaz Métro, the Gaz Métro Task Force, Hawaiian Electric, Hawaiian Electric Light, Jamaica Public Service, Maui Electric, Niagara Mohawk Power, NMGas, the Ontario Energy Board, Oshawa PUC Networks, San Diego Gas & Electric, Southern California Gas, and Unitil. We have testified on miscellaneous other Altreg issues for Atlantic City Electric, Commonwealth Edison, Commonwealth Energy, Delmarva Power, Georgia Power, Kentucky Utilities, Louisville Gas & Electric, New England Gas, Oklahoma Gas & Electric, Potomac Electric Power, Powerco, TXU Australia, TXU Electric, and Western Resources. Other clients we have advised on IR include the Electricity Supply Association of Australia, the Essential Services Commission, Powercor, the Queensland Competition Authority, and SPI Networks (Australia), the Superintendencia de Electricidad (Bolivia), Northern Electric Distribution and Yorkshire Electric Distribution (Britain), Alberta Power, BC Transmission, Duke Energy, Enbridge Gas Distribution ("EGD"), Alberta Power, BC Transmission, EPCOR, Hydro One Networks, Hydro-Québec TransEnergie, Oshawa PUC Networks, and Union Gas (Canada), the Bundesnetzagentur (Germany), Tokyo Electric Power (Japan), the Comision Reguladora de Energia (Mexico), and Baltimore Gas & Electric, Duke Energy, Entergy-Koch Trading, EEI, the Electric Power Research Institute, Entergy, Illinois Power, the Interstate Natural Gas Association of America, New England Gas, NSTAR, Public Service Electric and Gas, Questar Gas, Vectren, and Xcel Energy (United States).

Early Breakthroughs: PEG Research personnel played an influential role in early proceedings that established the index-based approach to IR that is favored in Canada.

- In 1994 I provided research and testimony for Central Maine Power in its successful bid to become the second US electric utility to operate under an MRP.
- In 1996 I provided research and testimony supporting the successful bid of Boston Gas to become the first US gas distributor to operate under an MRP.
- In 1997 I provided research and testimony supporting the successful bid of BC Gas to become the first Canadian energy utility to operate under an MRP. This was to my knowledge the first Canadian MRP to feature revenue decoupling.

Recent Work: PEG Research personnel have continued to provide IR leadership to the present day. The following recent projects illustrate the vitality of our practice.

- Research and testimony I prepared for SPI Networks developed an index for escalating O&M expenses in MRPs. This methodology is now being rolled out by the AER across Australia.
- We have advised the OEB on several generations of MRPs for Ontario gas and electric power distributors. Most notably, we have played a key role in the development of three successive generations of MRPs for provincial power distributors. We are the acknowledged experts on the productivity trends of Ontario power distributors. *Familiarity with the numerous deficiencies of Ontario data will be valuable in this proceeding given the comparatively slow productivity growth of distributors in that province.*
- In Québec, I testified several years ago on MRPs for HQ Trans Energie. This familiarized me with the economics of HQ's vast transmission system. I have more recently done productivity research for the Gaz Métro Task Force and MRP research and testimony for Gaz Métro. *The Régie cited my work for the Task Force in ordering Gaz Métro to develop an MRP with revenue decoupling and an ARM based on index research.*
- I represented the Consumers' Coalition of Alberta in two Alberta proceedings on the implementation of MRPs for provincial power distributors. My work in the first proceeding was chiefly concerned with the appropriate X factors for gas and electric distributors. I was on the winning side on this issue. The second proceeding considered the appropriate role of capital cost trackers in an MRP. This experience has sensitized me to the many issues that arise in combining capital cost trackers with index-based ARMs.
- I represented the Commercial Energy Consumers of British Columbia last year in a proceeding on IR for the gas and electric operations of Fortis. My principal focus was setting appropriate X factors for the two companies. The Commission

sided with my position on industry productivity trends, chose a positive X factor, and rejected the Fortis productivity research.

- In the last four years, we have also prepared productivity research and testimony for Central Maine Power, the Electricity Distributors Association in New Zealand, and Unitil (Massachusetts).
- I am currently preparing a white paper on MRPs for a multiclient study.

British/Australian IR: Utility of the future discussions often tout the relevance of the British approach to IR, which is also used in Australia. We have done several projects involving British-style IR.

- We advised two British power distributors (Northern and Yorkshire) on regulatory strategy in 2004 during the third price control update.
- We advised the Essential Services Commission ("ESC") of Victoria in Melbourne, Australia on various issues in MRP design for several years.
- The custom IR plans permitted by the OEB are the leading example of British-style MRPs in North America. We have advised the OEB on the recent custom IR filings of Enbridge Gas Distribution and Toronto Hydro Electric.
- We have advised several clients on the menu approach to X factor selection, and have established a team to review the menu literature and develop menus that reflect state of the art benchmarking and productivity research.

Survey Work, White Papers, and Conference Presentations: In addition to Altreg empirical research, plan design, and testimony, PEG personnel have written several articles and white papers that explain and document Altreg developments. Here are some noteworthy examples.

- In 1995 we published our first white paper on IR, this one for the Electric Power Research Institute.
- In 1995 we published a *Price Cap Designer's Handbook* for the Edison Electric Institute ("EEI").
- In 2002 we published the authoritative survey "Performance-Based Regulation of Energy Utilities" in the *Energy Law Journal.*
- We have also published articles on IR in the *Electricity Journal* (1991, 2006, and 2009), *Natural Gas and Electricity* (2003, 2004), and the *International Handbook on the Economics of Energy* (2009).
- We have recently prepared two authoritative surveys of MRPs and other Altreg precedents for EEI (2011 & 2013). This survey work was referenced by Elenchus

in the Appendix of their report to the Régie. We are currently preparing a new Altreg survey for EEI.

- We just released a white paper entitled *Multiyear Rate Plans for Minnesota Energy Utilities* for the Northern States Power - Minnesota subsidiary of Xcel Energy.

Detailed documentation we have already gathered on IR precedents through projects like these would be made available for use in any testimony I provide at no cost.

Statistical Benchmarking: Benchmarking studies are routinely filed in IR proceedings in Australia, Britain, and Ontario. PEG Research is a North American leader in statistical benchmarking of energy utility performance. Benchmarking the cost and reliability of power distributors is a company specialty. The following studies are especially notable:

- We have performed several benchmarking studies (most recently in 2014) using Ontario data for the OEB. The Board has used these studies to set stretch factors for provincial power distributors.
- In 2014, we prepared a transnational statistical benchmarking study of power distributor O&M expenses for the Australia Energy Regulator.
- We just critiqued a self-serving statistical benchmarking study prepared by Toronto Hydro for a custom IR application and developed our own study based on US data. We previously critiqued benchmarking and productivity studies prepared for Enbridge Gas Distribution by Concentric Energy Advisors.
- We have developed benchmarking models for SAIDI and SAIFI using a transnational US/Australian dataset.
- I am currently providing benchmarking and productivity research and testimony supporting the cost forecast in a custom IR proposal by a small, progressive municipal utility in Ontario, Oshawa PUC Networks. Using a cost benchmarking model we developed for the OEB, we have demonstrated that Oshawa's proposal reflects good cost performance and a productivity trend exceeding the industry norm. This is a "best practice"approach to substantiating the cost forecast in a custom IR application. The work has included the development of a methodology for productivity-based budgeting of O&M expenses.

We have also prepared benchmarking studies for two Australian *transmission* utilities.

Our transnational benchmarking capability is especially relevant in this proceeding, since large samples of standardized data for benchmarking large electric utilities aren't

available in Canada and Ontario provides data on only one utility that is similar to HQ. US data are especially essential for benchmarking the cost of HQT.

Conflicts of Interest: PEG Research has done MRP research for the Gaz Métro Task Force and MRP research and testimony for Gaz Métro. Resumption of this work was postponed indefinitely more than 2 years ago while the company addresses other issues before the Régie. Some years ago, I testified on IR for HQT. I have had no subsequent work with HQ.

References:

David Craig
Executive Director
Commercial Energy Consumers of British Columbia
Suite 720 – 1190 Melville Street
Vancouver, B.C., V6E 3W1
Phone: (604)568-4904

Jay Shepherd
Counsel for the Ontario Schools Energy Coalition
Jay Shepherd P.C
2300 Yonge Street, Suite 806
Toronto, Ontario M4P 1E4
Phone: (416)483-3300

Jim Wachowich
Counsel for the Consumers' Coalition of Alberta
Wachowich & Company
888, 10310 Jasper Ave., NW,
The Melton Building
Edmonton, AB T5J 2W4
Phone: (780)429-0555

IR Team

The team we are prepared to offer the AQCIE has remarkable depth. This is a tribute to the loyalty of our staff and their dedication to the Company's mission of improving utility regulation. I hope you will also notice our staff's high level of educational attainment. Most of our staff have been trained at the University of Wisconsin, which has a world class economic statistics program.

Mark Newton Lowry: I am the President of PEG Research and have almost thirty years of experience as an industry economist. I offer to serve as the principal investigator for the project and expert witness. IR and utility performance measurement have been my chief professional focus for twenty five years. I have testified dozens of times on IR and benchmarking and have also testified on capital cost trackers, revenue decoupling, and other Altreg issues. I am extensively involved in the development of performance metrics for utility of the future regulation.

Before joining PEG, I was a Vice President at Christensen Associates here in Madison and was for several years an Assistant Professor of Mineral Economics at the Pennsylvania State University.[5] During my academic years I spent a summer as a visiting professor at HEC in Montreal. I have chaired numerous conferences on Altreg and utility performance measurement and have written numerous articles on these subjects. A Cleveland, OH native, I attended Princeton University and hold a Ph.D. in Applied Economics from the University of Wisconsin – Madison ("UW").

With respect to language, I can serve clients in French and Spanish as well as my native English. There is no need to translate documents or to correspond with me in English. My spoken and auditory French is rusty from disuse since the postponement of Gaz Métro's IR initiative, but would improve greatly over the course of a lengthy engagement. I can also add a native French economist to the project team if this is imperative.

Larry Kaufmann: Larry is a Senior Advisor to PEG Research and can provide high level consultation on selected topics. He could also in principle serve as principle investigator or witness. Larry has provided research and testimony on benchmarking, service quality, and IR design issues for numerous North American clients. Most notably, he has for many years ably led our work for the Ontario Energy Board. Larry has also managed IR projects for the Essential Services Commission in Australia, Germany's Bundesnetzagentur, and numerous other overseas clients. Before joining PEG, Larry was a Senior Economist at Christensen Associates. He earned an Economics Ph.D. at UW.

Blaine Gilles: Blaine is a Senior Advisor to PEG Research. He is available to assist on diverse tasks. Formerly a Senior Vice President at WilTel Communications, he has also held managerial positions at Pac-West Telecomm, Level 3 Communications, New Cross Technologies, WorldCom, and Ameritech. An expert on utility regulation, he has worked at the Illinois Commerce Commission and taught economics at Kalamazoo College. He

[5] All of the key members of my group at Christensen Associates now work for PEG Research.

holds a PhD in Economics from Michigan State University, where he was a student of noted regulatory economist Harry Trebing.

John Kalfayan: John is a Senior Advisor to PEG Research. He is our senior econometrician and can contribute to any needed econometric work in later stages of the proceeding. Before joining PEG Research, John worked as a Senior Economist at Christensen Associates. He has an ABD status in Economics at the University of Wisconsin.

Dave Hovde: Dave is Vice President of PEG Research. He has two decades of experience in the field of statistical cost research and would play a leading role in any statistical work undertaken in later stages of the proceeding. A native of Waukesha, WI Dave holds a master's degree in economics from the University of Wisconsin.

Kaja Rebane:Kaja is an Economist II at PEG Research. She would assist Dave in any future statistical research that is required, and is an excellent writer and editor. A graduate of Stanford University, she holds a Master's degree in Applied Economics from the University of Wisconsin. Kaja is working for us half-time while pursuing a PhD in Energy and Resources at UW.

Alex Verbny: Alex is an Economist II at PEG Research. He is heading up our incentive compatible menu project. Having passed his theory prelims and the coursework for an econometrics major field, he is a candidate for a PhD in economics at UW. He previously worked as an intern for PEG while earning undergraduate degrees in economics and mathematics at UW.

Matt Makos: Matt is a Consultant II at PEG Research. He plays the leading role in our ongoing monitoring of IR and other Altreg precedents. Matt is also quite active in the preparation of our reports, testimony, and data requests. A Darlington, WI native, he holds an undergraduate degree in Business from UW.

Stelios Fourakis: Stelios is also an entry-level economist. He is a gifted statistician and is active in our incentive-compatible menu project. A Middleton, WI native, he holds a BA in Political Economy from Georgetown University.

Gretchen Waschbusch: Gretchen manages our Madison office and would handle invoicing for the project. She also assists with our research. A native of West Bend, WI, Gretchen holds an undergraduate degree in Business from UW and an MBA from Edgewood College.

7. Proposed Tasks and Timeline

Here is a timeline for possible services:

August 2015	Finalize contract once Régie approves of our participation and budget proposal Discussions with intervenors on key background considerations in applications to HQT and HQD
September 2015	Proffer advice to intervenors on 1) characteristics and operational objectives of IR for HQ transmission and distribution services and 2) regulation of independent networks. An optional trip to Montreal is proposed. Should this be deemed unnecessary, the funds are needed for the other proposed tasks.
October 2015	Prepare IR evidence, including use of our detailed database of IR precedents. First draft submitted on October 15th.
November 2015	Finalize evidence and prepare data requests. There is a proposed budget to assist with data requests even if we are not asked to provide evidence.
February 2016	Oral testimony

In selecting PEG for these tasks, intervenors retain priority access to our services in later stages of the proceeding.

Here is a proposed outline for Phase I testimony:

Executive Summary
Introduction
Incentive Regulation
- Basic Idea
- Salient Approaches
  - Revenue decoupling
  - Performance Metric Systems

- Multiyear Rate Plans

Key Issues in MRP Design

- Attrition Relief Mechanism
  - Indexing
  - Fully Forecasted
  - Hybrid
  - Tracker/Freeze
- Cost Trackers
- Earnings Sharing Mechanism
- Incentive-Compatible Menus
- Revenue Decoupling
- Performance Metric System
- Off Ramp Provisions
- Marketing Flexibility Provisions
- Plan Term
- Efficiency Carryover Mechanism and other Plan Termination Provisions
- Desirable Statistical Research (in Phase 2)
  - Productivity Trends
  - Cost and Reliability Benchmarking
  - Need to appraise cost *forecasts*

Special Concerns in T&D Applications

- Transmission
  - Stairstep cost trajectory
  - Special service quality issues
  - Need for marketing flexibility
  - Do price caps or revenue caps make sense?
  - Other
- Distribution

Special Circumstances in Quebec

- Independent Networks
- Remote generation sources
- Heavy reliance on renewable resources
- Applicable Laws
- Other

Recommendations

- Characteristics and operational objectives of IR for Hydro Quebec
  - Transmission
  - Distribution

- Regulation of Independent Networks

With respect to the desired statistical research (Phase 2), we believe that studies should be undertaken of transmission and distribution productivity trends in the United States. These studies should also address the proper construction of an input price index and available evidence on utility input price and productivity trends in Canada. A study of distribution productivity trends is especially essential inasmuch as there is a fairly high likelihood that the Regie will ultimately choose an index-based ARM for HQD.

It would also be desirable to undertake statistical benchmarking studies (Phase 2) of Hydro Quebec's T&D cost efficiency and reliability. It may be possible to measure HQ's recent productivity trends using the benchmarking data. In addition to a look at historical costs, it is possible in a later stage of the proceeding to benchmark HQ's *proposed* cost and to calculate the productivity growth implicit in their cost forecast.

There is a good chance that HQ will prepare (at enormous cost) its own productivity and benchmarking studies, much like Enbridge Gas Distribution did in a recent Ontario proceeding. *Commissioning separate consumer-funded studies is far more effective in this eventuality than simply poking holes in the HQ studies.*

The availability of data needed to study HQ's cost and reliability performance is unknown. It is noteworthy that HQ suggested in the June conference that any such studies be based on data that are already in the public domain. In fact, there may be a need to obtain supplemental data. The expert should stress the importance of the right to requisition required data.

Cost of Services

AQCIE can be billed for our Phase I work on a fixed price basis or on a time and materials basis subject to caps. *In recognition of the cap the Régie has placed in Phase I expert expenditures, we are prepared to reduce our hourly rates for this phase of the project as follows.* All rates are quoted in *Canadian* dollars to provide extra value. Consumers will thus be ensured that a sizable number of hours will be spent to produce a quality product.

	Original Proposal	Phase I
Mark Newton Lowry, President	400	340
Larry Kaufmann, Senior Advisor	400	340

Matt Makos, Consultant II	170	145
Kaja Rebane, Economist II	170	145
Alex Verbny, Economist II	170	145
Gretchen Waschbusch, Consultant I and Office Manager	170	130
Stelios Fourakis, Economist I	160	130

We propose a firm cap on the cost of providing all of the proposed services in the attached spreadsheet of $99,700. If some tasks prove less costly than expected, the money saved can be used to better execute other tasks.

Conclusion

I hope your review of this letter prompts you to conclude that PEG Research is the right choice to advise the AQCIE and other consumer groups in Québec on IR in Phase I of the Régie's IR proceeding. We can provide expert advice and testimony that enhances the record in this proceeding. Our advantages as a consultant on the requested topics include the following:

- Leading experts on the index-based approach to MRPs that seems consistent with Quebec law, is favored in Canada, and that the Régie has seemed to favor.
- Reputation for objective testimony, a requirement of Quebec law.
- Unrivalled statistical benchmarking, productivity, and productivity-based budgeting experience, including benchmarking and productivity studies of the cost *forecasts* HQ will likely file in this proceeding.
- Experts on the input price and productivity trends of US and Canadian utilities.
- Extensive recent work on new performance metrics for the "utility of the future"
- Record of support for key IR issues (e.g., revenue decoupling) that matter to environmental groups
- Experience with *transmission* IR, benchmarking, and productivity measurement
- Extensive experience with the US and Ontario data that would likely be used in benchmarking and productivity research
- Expert on issues that concern environmentalists in IR proceedings
- Familiarity with HQ and its regulatory environment
- Proven track record as consumer advocate in Canadian IR proceedings
- French language capability.

Despite our respected position in the field, our private ownership, home base in the American Midwest, and great liking for Québec encourage me to offer our services at competitive rates. *Reasonable hourly rates are critically important given the large scope of work required and the limits that may be placed on intervenor budgets in this proceeding.* As the leading North American authority on IR, we will not charge large fees to "reinvent the wheel".

Thanks very much for giving us the opportunity to offer our services.

Sincerely,

Mark N. Lowry, Ph.D.
President
PEG Research, LLC
mnlowry@pacificeconomicsgroup.com
(608) 257-1522