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BY E-MAIL

May 12, 2008

Board Secretary
Ontario Energy Board
2300 Yonge Street, Ste. 2701
Toronto ON M4P 1E4

Attention: Ms. Kirsten Walli, Board Secretary

Dear Ms. Walli:

Board Staff Responses to OPG and GEC IRs
Board File # EB-2007-0905 - Payment Amounts for OPG's Prescribed Facilities

Enclosed are Board Staff's responses to OPG's and GEC's interrogatories. These are now presented in the appropriate format and the content has not changed from what was filed on Friday May 9, 2008.

Yours truly,

Original signed by

Richard Battista
Project Advisor

Encl.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #1

Ref: Page 19

Preamble: London Economics International ("LEI") states that the ability to rely on OEFC for debt financing means that OPG is partly shielded from market disruptions like the recent credit crunch which has delayed financing for large capital intensive projects both in and out of the electric power industry.

Interrogatory

Please provide the details of all delays in financing for large capital intensive projects in the electric power industry, including Canada, which were caused by the recent ABCP credit crunch.

Response

The paragraph on which the interrogatory is based makes it clear that the focus of this part of LEI's evidence is the mitigation of risk provided to OPG by OEFC debt financing, not the delays in financing for large capital intensive projects in the electric power industry. The paragraph reads:

> *Overall, we are of the view that OPG reliance on OEFC for debt financing is a risk (and cost) mitigant. Whether OEFC is being appropriately compensated for this service is a matter outside of our purview. However, from OPG's perspective, relying on OEFC for financing means that OPG need not repeatedly justify its proposed investments to every major investment bank on Bay Street every time it seeks financing. Furthermore, it means that, from the perspective of those working with OEFC on debt financings, OPG is viewed as part of a larger provincial financing account, resulting in better potential pricing. Finally, the ability to rely on OEFC for debt financing means that OPG is partially shielded from market disruptions like the recent credit crunch which has delayed financing for large capital intensive projects both in and outside of the electric power industry.*

As drafted, the interrogatory requests information that is not relevant to the issue of the mitigation of risk provided to OPG by OEFC. Nonetheless, we can fully substantiate our position. It is not necessary for us to provide details of "all" delays in financing for electric power projects in North America in order to demonstrate that the credit crunch has had an impact on financing. We note as well that our definition of the credit crunch extends well beyond asset-backed commercial paper in Canada, to encompass the sub-prime mortgage crisis in the United States.

Some players, such as Allco Financial, were forced to withdraw entirely from the power space in North America, abandoning ongoing deals and selling existing assets. Others have begun limiting their activities to servicing existing debt. Renewables developers have been forced to downsize offerings, and private equity financing has become more scarce. An even cursory reading of the trade press provides numerous examples which support these statements.[1]

We do not assert that financing for power sector investments is unattainable, but only that obtaining it has become more difficult in the past 18 months, and that OPG and the prescribed assets are partially shielded from this effect.

[1] For publicly available discussions of the impact of the credit crunch, see for example "California Player Delays Turbine Funding," *Power Finance and Risk*, January 25, 2008; downsizing and increased cost for refinancing of Sandy Creek, *Power Finance and Risk*, April 4, 2008; "Sub-prime crisis hurts efforts to finance Ohio IGCC project, says its developer," *Global Power Report*, April 10th, 2008, p.3., sub-prime crisis as cause for delay of auctioning Reliant's gas fired portfolio, *Power Finance and Risk*, April 18, 2008.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #2

Ref: Section 3.1.3

Preamble: LEI discusses the effect of the ONFA. The discussion relates to the risk to OPG related to the treatment and storage of nuclear fuel bundles. Nuclear liabilities also include decommissioning costs. LEI's discussion does not include decommissioning costs.

Interrogatory

Please indicate where in its report LEI took into account the risks associated with decommissioning costs. If they did not, please explain why not.

Response

Although we do not discuss decommissioning costs in detail in our report, we view such costs as being incorporated into any determination of the risks of operating a nuclear business. While the structure of the decommissioning fund under the ONFA is somewhat different than that used elsewhere in North America, the fund has been set up, was over-funded at the end of 2007[2], and rules are in place to determine future costs and how they are allocated. As such, we do not believe that OPG is so uniquely affected by decommissioning cost risks that it would affect our conclusions in the report relative to how we would view the risks for other North American nuclear plant owners.

[2] OPG Annual Report 2007, p.108

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #3

Ref: Figures 3, 8, 10, 12

Preamble: LEI provides a number of figures which indicate directionally the impact of various factors on OPG's ability to raise debt.

Interrogatory

When LEI indicates that a factor increases OPG's ability to raise debt, is the comparison to the Ontario wires companies, merchant generators, or relative to the circumstance where the specified factor is absent. For example, in Figure 10, LEI indicates that dispatch risk increases the ability to raise debt. Does LEI mean that OPG has an increased ability to raise debt relative to a merchant generator or simply relative to a situation where the dispatch risk is higher than it is for OPG?

Response

It is important to be precise in this matter; our report is not about OPG as a whole, but rather about the prescribed assets specifically. Thus, all statements relate specifically to the ability to raise debt associated with the prescribed assets. When we state that a factor increases OPG's ability to raise debt associated with the prescribed assets, this is relative to the circumstance where the specified factor is absent. Thus, in the case of dispatch risk, were dispatch risk associated with the prescribed assets to be higher, the amount of debt that could be raised would fall.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #4

Ref: Figure 13

Preamble: LEI presents information on allowed returns and capital structures for a number of provincially-owned integrated electric utilities.

Interrogatory

(a) Please confirm that Newfoundland Power is investor-owned.
(b) Please explain why LEI considers Newfoundland Power to be a vertically integrated power utility.
(c) Is the debt of any of the provincially-owned utilities listed in Figure 13 guaranteed by the province? Do any of the provincially-owned utilities pay debt guarantee fees to the province? Should the fact that the debt is guaranteed be taken into account in assessing the risk compensation received by shareholders? Please provide a full explanation in the response.
(d) With respect to BC Hydro, could LEI please confirm that the deemed common equity ratio for the provincially-owned British Columbia Transmission Corporation (BCTC) is 40.7%.

Response

(a) Yes, Newfoundland Power is investor-owned; it is a subsidiary of Fortis. It is included in the chart of provincially-owned utilities merely for the convenience of the reader. Note that Figure 1, on page 5, clearly notes that it is privately, rather than provincially, owned.

(b) According to the Newfoundland Power website, it "operates 23 hydro generating plants, three diesel plants and three gas turbine facilities." While Newfoundland Power purchases the vast majority of its power from Newfoundland and Labrador Hydro, it nonetheless is vertically integrated in that it does own generation, transmission, and distribution assets. We nowhere suggest that Newfoundland Power generates 100% of the power that it supplies to its customers.

(c) The table below provides further information on provincial debt guarantees and fees paid. With regards to the impact on the risk compensation received to shareholders, overall, the presence of a government guarantee likely justifies a greater amount of debt in the capital structure than would otherwise be the case.

Figure 1. Provincially-owned utilities and debt guarantees

Utility	Total long-term debt ($ millions)	Guaranteed by provincial government ($ millions)	Fees paid ($ millions)	Note	Source
Hydro Quebec	$34,411	$34,383	$169	Annual data for 2007	Annual Report 2007
BC Hydro	$6,235	$6,235	unspecified	Annual data for 2007	Annual Report 2007
Manitoba Hydro	$6,822	$6,765	$71	Annual data for 2007	Annual Report 2007
SaskPower	$2,225	unspecified	unspecified	Most debt is raised through Ministry of Finance	Annual Report 2007
NB Power	$2,869	$2,869	$20	Debt portfolio management fee	Annual Report 2007

In terms of the impact on required equity compensation, arguably the "halo" effect extends to equity compensation as well, in that quasi-governmental entities may be perceived as being less risky than other similar entities without government involvement. While extensive analysis of this phenomenon is beyond the scope of our engagement, it is worthwhile to consider the case of the many US government-associated financial entities (Fannie Mae, Freddie Mac, Sallie Mae, etc.)[3] relative to entities such as Bear Stearns and Countrywide Financial; all of these quasi-governmental organizations have publicly traded equity, and arguably have as much or more exposure to credit issues associated with the current sub-prime mortgage situation. Nonetheless, it is likely that few equity investors in these entities expect to meet the same fate as those who invested in Bear Stearns or Countrywide, even though they receive no formal backing from the US government.

(d) Based on Order in Council Number 752, approved and ordered October 19th, 2005, BCTC's deemed equity component is 40.7%.

[3] Formally, the Federal National Mortgage Association, the Federal Home Loan Mortgage Association, and the Student Loan Marketing Association, which is now SLM Corp. The first two remain government-sponsored entities (GSEs), while the third is no longer a GSE, and thus benefits less from the "halo" effect. However, neither Fannie Mae or Freddie Mac are backed by explicit government guarantees.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #5

Ref: Page 38

Preamble: LEI states that U.S. allowed returns can vary regionally by as much as 500 basis points.

Interrogatory

Please provide support for this alleged variance, including any support that it is attributable to regional factors. Please provide all particulars and analysis relied upon.

Response

As the sentence referred to continues, "this suggests that even within the US there is little consensus on what the appropriate allowed return should be." This is clearly evident in the diverging position of the US Federal Energy Regulatory Commission (FERC) and many US states, particularly those in the Northeast. For example, as is specified in Figure 15 on page 38, the recent allowed return on equity for ConEd of New York is 9.1%. By contrast, FERC has recently awarded rates as high as 14.3%[4] -- a difference of more than 500 basis points. While we grant that the latter was for new transmission, while the former was for a more than 100 year old distribution system, it is not clear that this difference can be explained on the basis of a careful analysis of the underlying risks.

As the map on the following page shows,[5] US states have wide divergences in allowed returns on equity, with ROEs as much as one third higher in one state versus another. Note that the map is not intended to present every utility in every state, nor does it suggest that the rate cases from which the ROEs were drawn represented exactly the same asset bundle. However, given the sample size, we can assume that overall the

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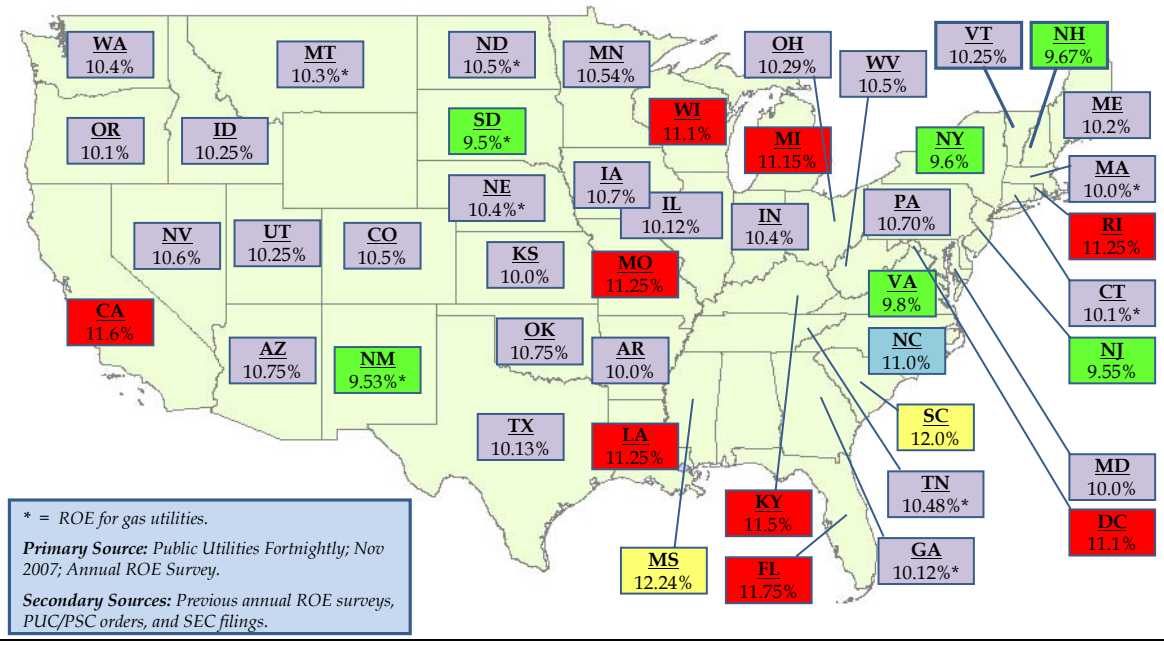
[4] FERC docket number ER08-386-000, Potomac-Appalachian High Line, 29th February 2008.

[5] Rate cases shown are largely for electric utilities; ROEs for gas utilities are used only in cases where gas utilities had the most recent rate case or, like Nebraska, where no privately owned electric utilities exist. Rates shown may differ from those in tables in figures in the submission, because they are for different companies in that state.

trends are meaningful. The regional factors to which we refer are not specific risk factors associated with a particular state; rather, we believe that the differences are largely a function of the degree of regulatory capture that has taken place within a state. The number of utilities in a jurisdiction, their size, the overall size of the state government, and the resources allocated to the regulator all potentially play a role in a utility's ability to attain an above average allowed ROE. Broadly speaking, allowed returns in the Northeast tend to be among the lowest, while those in the Southeast can be among the highest.

Figure 2. Selected indicative state-by-state allowed returns on equity



Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #6

Ref: Page 38

Preamble: LEI state that many of the higher allowed returns are artifacts of earlier rate cases which have yet to be updated.

Interrogatory

To which allowed returns is LEI referring? Please provide the dates of the last rate cases for each utility considered. Please provide a list of all allowed returns which are the product of recent cases.

Response

Rates presented in the submission are for the most recent regulatory proceeding held where available. The table below shows the date of the rulings referred to in Figure 15.

Figure 3. Date of rate cases referred to in Figure 15 of the submission

Holding Company	Regulated Entity	Date of decision	Made by
CH Energy Group, Inc.	Central Hudson (Distribution)	25-Jul-06	NY State Public Service Commission
Consolidated Edison Inc.	ConEdison of New York (Distribution)	25-Mar-08	NY State Public Service Commission
Energy East	NY State Electric & Gas (Distribution)	23-Aug-06	NY State Public Service Commission
	Rochester Gas & Electric (Distribution)	1-Jan-07	NY State Public Service Commission
	Central Maine Power (Transmission)	31-Oct-06	FERC
NSTAR	NSTAR (Transmission)	31-Oct-06	FERC
Pepco Holdings, Inc.	Pepco (Distribution, District of Columbia)	27-Jan-06	District of Columbia Public Service Commission
	Pepco & Delmarva (Distribution, Maryland)	19-Jul-07	Maryland Public Service Commission
UI Holding Corporation	United Illuminating (Distribution)	27-Jan-06	Department of Public Utility Control
	United Illuminating (Transmission)	31-Oct-06	FERC
Unitil	Unitil Energy Systems (Distribution)	6-Oct-06	New Hampshire Public Utilities Commission
	Fitchburg Gas&Electric Light (Distribution)	29-Feb-08	Massachusetts Department of Public Utilities
	Fitchburg Gas&Electric Light (Transmisson)	18-Sep-06	FERC

With regards to the general assertion made that higher rates in some jurisdictions are artifacts of earlier rate cases, LEI has identified two states, Rhode Island and Alabama, in which rate cases for some companies are more than a decade old; other companies in other states operate under rate orders that have been in place for several years.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #7

Ref: Page 16

Preamble: LEI states that within a broad range, it may be possible to increase debt without equity holders demanding perfectly counterbalancing increases in their equity returns.

Interrogatory

Please confirm that the general proposition to which LEI is referring is that the overall cost of capital does not change materially as the debt ratio rises. If they cannot confirm, please explain why.

Response

At no point on p.16 or elsewhere does LEI say that "the overall cost of capital does not change materially as the debt ratio rises." What LEI states is that "within a broad band it may be possible to increase debt without equity holders demanding perfectly counterbalancing increases in their *equity* returns." In other words, for each asset, an optimal capital structure exists which provides the lowest overall cost of capital to achieve the desired investment amount. Debt levels set below the debt carrying capability of an asset increase the cost of capital above what it otherwise should be, as would debt levels above the optimal capital structure. Furthermore, there is a range of debt levels wherein an increase in the amount of debt does not significantly increase the returns demanded of equity holder.

For assets which provide robust and stable debt service coverage ratios, an increase in the level of debt may result in little if any change in the cost of equity on a practical basis, thus decreasing the overall cost of capital even as the level of debt rises. By contrast, for an asset with volatile and unpredictable cashflows[6], even a moderate increase in debt may result in a large increase in the cost of equity. We place the prescribed assets in the former category.

[6] Note that volatile but predictable cash flows can be dealt with using debt service reserve accounts, which allow for debt to be raised based on levels more closely approximating average debt service coverage ratios rather than minimum debt service coverage ratios.

Please see the appendix for a more detailed discussion of non-linear effects associated with debt-to-capital ratios and capital costs.

Appendix: critiques of Modigliani-Miller

The Modigliani-Miller (MM) theorem states that, in the absence of taxes, bankruptcy costs, and asymmetric information, and assuming markets are frictionless (i.e. efficient), the value of a firm is completely unrelated to its capital structure. In 1963 theorem was modified to include the effects of taxes, but this theory is incomplete and offers conclusions that are obviously out of line with reality. If the second version of MM holds, companies should optimally finance themselves entirely with debt, and no corporations would pay taxes. Neither of these holds true in the real-world, the implication being corporations must derive some benefit from financing themselves partially through equity.

MM states that there is a linear relationship between the cost of equity and the debt-equity ratio. A higher debt-equity ratio requires equity to deliver a higher return. The question to be addressed here is whether or not this linear relationship holds for all levels of debt. This is, however, a difficult question to answer. To begin with, the validity of MM itself has been difficult to prove directly. In their original 1958 paper, Modigliani and Miller offered some evidence that the theorem holds in the real world. Empirical studies conducted since then, however, have presented contradicting results. As Miller himself noted in 1988, “Our hopes of settling the empirical issues… have largely been disappointed. Direct statistical calibration of the goodness of fit of the MM value-invariance propositions has not so far been achieved by us or others for a variety of reasons.”[7]

Papers that attempt to empirically address the question of whether or not MM holds in the real world tend to take an all-or-nothing approach to the problem. Few papers take on the specific question of whether or not the cost of equity increases linearly with debt, and most papers that do address the question do not address the more specific question of whether or not it is possible for the cost of equity to be increasing for some levels of debt, and non-increasing for others. To examine the question, therefore, it makes sense to focus on refinements to MM since 1958.

Three main theories of capital structure have emerged that attempt to explain deviations from MM’s predictions: tradeoff theory, pecking order theory, and free cash flow theory.

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[7]Merton H. Miller, *The Modigliani-Miller Propositions After Thirty Years* (1988)

Tradeoff theory assumes that firms determine their optimal debt level by comparing the tax advantages of more debt to the potential cost of financial stress. Pecking order theory says that firms will choose to borrow, as opposed to issuing equity, whenever their internal cash flow won't cover capital expenditures. The free cash flow theory says that excessive debt levels can increase a company's valuation, regardless of the risk of financial stress, whenever their cash flow exceeds the opportunities for profitable investments.

Tradeoff theory does suggest that the cost of equity may be non-linear. Booth (2007) notes that "[W]ith the static tradeoff model, by definition, there is an interior optimum debt ratio so that the coefficient on the debt equity ratio is non-linear. This means that the equity cost increases in a more complex, firm specific, way than is assumed in M&M (1963)."[8] In an earlier paper, C. C. Pflaum Jr. (1983) also found a non-linear relationship between the cost of equity and the debt-equity ratio[9]. Fattouh, Scaramozzino, and Harris (2002) examine in some detail the relationship between leverage and overall capital structure, concluding that it is non-linear (at least in the UK). They find that the effect of variables such as size, asset structure, growth opportunities, profitability and non-debt tax shields on capital structure varies depending on how leveraged the company is.

Relevant works:

Booth, L. (2007). "Capital Cash Flows, APV and Valuation." *European Financial Management* 13(1): 29-28.

Fattouh, B., P. Scaramozzini, et al. (May 2005). Non-Linearity in the Determinants of Capital Structure: Evidence from UK Firms. Available at SSRN: http://ssrn.com/abstract=789304.

Marsh, P. (1982). "The Choice Between Equity and Debt: An Empirical Study." *The Journal of Finance* 37(1): 121-143.

Miller, M. H. (1988). "The Modigliani-Miller Propositions After Thirty Years." *Journal of Economic Perspectives* 2(4): 99-120.

[8] Laurence Booth, *Capital Cash Flows, APV and Valuation* (2007)

[9] Based on the abstract of the paper (see: http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=6588841)

Myers, S. C. (2001). "Capital Structure." *Journal of Economic Perspectives* 15(2): 81-102.

Pflaum, C. C. Jr. (1983). Cost of Capital to a Public Utility. Columbia, SC, Univ. of South Carolina. Ph.D.: 136.

Shyam-Sunder, L. and S. C. Myers (1999). "Testing Static Tradeoff Against Pecking Order Models of Capital Structure." *Journal of Financial Economics* 51: 219-244.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #8

Ref: Page 36

Preamble: LEI states that Hydro One is exposed to volume risk due to weather patterns.

Interrogatory

Please provide all quantitative analysis performed by LEI on the sensitivity of Hydro One's volumes and returns on equity to weather.

Response

LEI was not commissioned to perform a quantitative analysis of the sensitivity of Hydro One's volumes and returns on equity to weather, nor is it at all necessary to do so to support the arguments in LEI's submission. LEI is making two points in the submission relative to Hydro One: first, wires companies like Hydro One are not risk free; second, depending on the associated contractual arrangements, generation assets are generally more risky than wires company assets due to a number of factors, including relative outage factors, fuel cost volatility, dispatch risk, and so forth.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #9

Ref: Page 38

Preamble: LEI states that higher ROEs than are necessary to attract capital in the U.S. simply result in transfers from ratepayers to shareholders.

Interrogatory

a) Is it LEI's evidence that the ROEs in the U.S. are higher than necessary to attract capital? If yes, please provide evidence that is the case.

b) Does LEI believe that the comparable return standard should apply as well as the ability to attract capital when determining a fair and reasonable ROE?

c) Does LEI agree that there has been underinvestment in electricity transmission infrastructure in the U.S.? If the returns have been higher than necessary to attract capital, why would there be underinvestment?

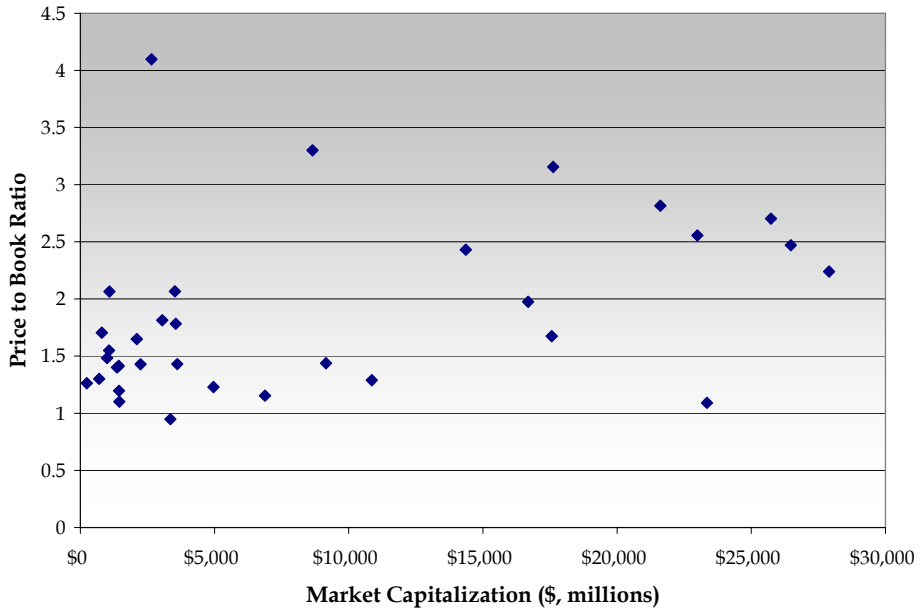
Response

(a) We believe that the variance in allowed rates in and of itself suggests that some utilities may be receiving rates higher than is necessary to attract capital if there is no evidence that lower allowed ROE utilities are capital starved. If we look at allowed returns in neighboring states on the above map (Ohio versus Michigan, or Pennsylvania versus Virginia, for example), it is arguable whether a 100 basis point differential exists in the required equity risk premium between these two state pairs.[10] Even more questionable is when allowed returns vary within a state.

[10] Again we emphasize that the map presented here is for illustrative purposes; a complete analysis of this topic would need to take into account all approved rates in each of the states, and control for any identifiable differences in risk. Such a detailed study is beyond the scope of our engagement. This does not, however, make the analysis meaningless; the rates shown are generally the most recent allowed rates in each of the states, and the asset bundles in each state are not dramatically different.

An examination of market to book ratios among utility companies in the US supports the view that there is a divergence between the ROEs awarded by state regulators and that demanded by the market. Adjusting for non-regulated activities – and many utilities have been abject failures in their unregulated business lines – if the cost of equity was consistent with that awarded by regulators, there should be little justification for equity to trade above book value, assuming that book value is equal to the regulated asset base. Yet we find that the vast majority of major utilities trade above book value, regardless of the extent of their unregulated activities. The graphic below shows the current market to book ratios for 33 US utilities. All but one trades at a ratio greater than one; the average of the sample is 1.9 times.

Figure 4. Price to book ratios for selected US utilities[11]



[11] Information downloaded from Yahoo Finance, May 8th, 2008. The companies examined include Allegheny Energy Inc.; American Electric Power Co. Inc; Black Hills Corp.; Central Vermont Public Service; Cleco Corp.; Constellation Energy Group, Inc.; Dominion Resources Inc.; DTE Energy Co.; Duke Energy Corp.; Edison International; El Paso Electric Co.; Empire District Electric Co.; Entergy Corp.; Firstenergy Corp.; FPL Group Inc.; Great Plains Energy Inc.; Hawaiian Electric Industries Inc.; IdaCorp, Inc.; ITC Holdings Corp.; NSTAR; OGE Energy Corp.; Otter Tail Corp.; Pepco Holdings, Inc.; Pinnacle West Capital Corp.; Portland General Electric Company; PPL Corporation; Progress Energy Inc.; Puget Energy Inc.; Southern Co.; TECO Energy Inc.; UIL Holdings Corp.; Unisource Energy Corp.; Xcel Energy Inc.

(b) While we believe that the comparable return standard may be applicable [and we emphasize that we are not lawyers and in no way are offering a legal opinion], it is incorrect to determine that comparable return by examining regulatory proceedings. The comparable return should be based on actual returns to investors, rather than a simplistic comparison of allowed returns. In other words, if a regulator approves an allowed return on equity of 10% on an equity base of 100 dollars, and thereafter the equity in the marketplace is valued at 200 dollars, the proper application of the comparable return standard would result in a return on equity of 5%, not 10%, because the market has demonstrated that it is willing to hold the equity even though it only yields 5%.

(c) Underinvestment in transmission in the US has little to do with allowed returns, and a great deal to do with the overall siting and permitting environment in the United States. The determining factor in the amount of transmission investment which takes place is whether or not it can be permitted in a timely fashion. Even doubling the allowed return is not going to cause more transmission investment to take place in an environment in which one state is able to block transmission investment which is alleged to largely benefit another state; even within states, technically and economically feasible projects may be blocked by similar perceptions that the project is not Pareto optimal.

A contributing factor to underinvestment in transmission, though far less potent than the impact of dysfunctional permitting processes, is the failure to enforce full ownership unbundling of transmission from generation. Vertically integrated utilities operating in regions without a functioning independent system operator are unlikely to invest in transmission, even at high offered returns, if doing so will undermine the viability of their generation portfolio. Furthermore, transmission makes up a relatively small proportion of the overall assets of those utilities which continue to own both generation and transmission, which in turn starves transmission of senior management attention and business development time.

It is worth noting that US Federal Energy Regulatory Commission members are by no means unanimous in the view that higher returns for transmission are warranted; recent applications have included dissents from one or more FERC commissioners.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #10

Ref: Page 11

Preamble: LEI recognizes that OPG is an OBCA corporation with a commercial mandate.

Interrogatory

In this context, please explain why the capital structures and ROEs of Crown Corporations without similar mandates, U.S. federal power authorities and not for profit electricity cooperatives are relevant to OPG.

Response

On page 5 of our submission, we note that as part of the scope of work we were presented, we were asked to "in particular consider the capital structure and allowed ROEs of a number of Canadian provincially-owned… power utilities." On page 11, we highlight the fact that OPG is an OBCA corporation, and argue for a return consistent with that fact. Furthermore, on page 46 of our submission, we make a clear distinction between entities such as US Federal power authorities and various types of commercial entities.

This is not to suggest that we agree with the premise that Crown corporations with differing mandates are irrelevant to considering what an appropriate capitalization structure for the OPG prescribed assets would be – in fact, it is an exaggeration to suggest that commercial considerations are not taken into account by other provincial regulatory bodies when determining the cost of capital, and we are unconvinced that the regulatory decisions would change were the provincial entities specified to become entirely private entities. As footnote 52 of our submission notes, in Alberta, a province in which the power sector is in private and municipal hands, allowed ROEs and capital structures are consistent with those allowed in other provinces where the power sector is predominately provincially owned.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #11

Ref: Figure 21

Preamble: LEI presents a risk continuum.

Interrogatory

a) Based on the diagram, it would appear that LEI concludes that the S&P 500 is less risky than the TSX Composite. If this is the case, please explain why.

b) Please summarize the reasons that LEI concludes that the OPA contract holders are more risky than Generation Income Trusts.

Response

(a) The driving factors based on this assessment are the relative degree of diversification between the two indices; there are fewer companies in the TSX Composite (258 vs. 500) than in the S&P 500, and just two sectors (financial and energy) make up over 57% of the TSX Composite. We emphasize that the risk continuum presented is ordinal, and merely intended to provide a ranking of relative asset classes. The continuum does not identify the degree by which one asset class exceeds another in terms of risk. While in depth statistical analysis is beyond the scope of our engagement, preliminary research suggests that the overall difference in risk between the TSX Composite and the S&P 500 is likely to be moderate.

(b) Each OPA contract holder is considered in this instance to be a single project; therefore, it lacks geographic diversity, technology diversity, and fuel diversity. By contrast, most generation income trusts consist of multiple assets, many or all of which may be located outside of the province of Ontario. As such, political, mechanical, and counterparty risk is diversified, and depending on the portfolio, fuel supply risk may also be diversified.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #12

Ref: Page 50

Preamble: LEI states that generation assets even with regulated payment streams appear to be slightly more risky than regulated network companies.

Interrogatory

Please provide LEI's quantitative assessment of how much more risky generation is, in terms of incremental cost of capital.

Response

LEI's mandate was to provide a framework for the evaluation of the relative risk of various asset classes, rather than to quantify the degree of difference between them. As such, it was not necessary for us to calculate the incremental cost of capital for regulated generation assets relative to regulated network companies.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #13

Ref: Page 50

Preamble: LEI states that the OPG prescribed assets are less risky than generators with contracts from the OPA and should be able to sustain at least as much, if not more, debt in their capital structure.

Interrogatory

(a) Please provide details on the capital structures and returns on equity of all generators with contracts from OPA.

(b) In comparing private equity generators with OPA contracts to OPG, is it not necessary to have some knowledge of their associated return on equity and the cost of debt? Please explain why or why not.

Response

(a) Such details are confidential to the companies which negotiated such contracts with OPA.

(b) Noting that a fact is confidential is not the same as saying that one does not know it. LEI has advised both the OPA and private generators on matters associated with contracting and contract negotiation. Indeed, even without having knowledge of particular contract holder details, knowledge of required coverage ratios for commercial loans, market perceptions of counterparty credit risk, and hurdle rates of generators is sufficient to develop a meaningful indicative number.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #14

Ref: Page 50

Preamble: LEI states appropriate capitalization structures should be based on criteria used by credit rating agencies and lenders.

Interrogatory

Please provide the specific criteria set forth by the credit rating agencies to which LEI makes reference.

Response

We believe that regulators should establish capitalization ratios based primarily on debt service coverage ratios used by financial institutions to lend to entities with similar expected cash flow patterns. While ratings agency criteria can provide guidance in these matters,[12] evidence from actual financings, where available, should take precedence. Debt service coverage ratios vary from asset to asset; in recent cases LEI has advised on, a hydro generator was able to obtain leverage of 80%, based on a 1.3 fixed charge coverage ratio; in another case, a renewable generator advised by LEI was able to obtain offers of financing based on 65% leverage and a minimum debt service coverage ratio of 1.75.

We are in no way suggesting these numbers as precedence-setting; rather, we are asserting that the level of deemed debt for the prescribed assets should be consistent with the debt carrying capacity of those assets. Fully contracted assets with stable expected cashflows are capable of carrying greater leverage than assets which lack such characteristics.

[12] For example, Standard & Poor's corporate ratings criteria for 2008 suggest that companies with a "strong" or "excellent" business risk profile would be able to maintain an investment grade credit rating with a 55% debt to capital ratio.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #15

Ref: Page 15, Section 3.1.1

Preamble: LEI states that "the cost of this guarantee to OPG is likely far lower than if it had to obtain such credit insurance from an AA rated third party."

Interrogatory

Please provide LEI's estimate of the cost of such credit insurance?

Response

Based on a study performed in mid-2007 by LEI which examined the relative costs of credit default swaps of 243 companies with varying credit ratings,[13] LEI estimates that the cost for companies with the lowest investment grade rating to receive credit insurance that would effectively increase their rating to AA would be approximately 100 basis points. We expect that this cost may have increased over the past year, although such costs can vary widely depending on the market perception of the credit quality of the underlying issuer.

[13] Study was based on data pulled from Bloomberg on May 16th, 2007 and analyzed by LEI for a private client.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #16

Ref: Page 16, Footnote 24

Preamble: LEI estimates that OPG's saving with respect to the cost of borrowing as "at least 89 basis points" based on a comparison of 10-year AA and BBB+ bonds.

Interrogatory

What is LEI's estimate of the savings, if 10-year AA and BBB- bond yields were compared?

Response

An estimate based on quotes obtained from Bloomberg for values as of April 4, 2008 comparing 10 year yields and interpolating between the yields on BBB and BB+ to obtain the 10 year yield on a BBB- bond suggest that the savings could be over 107 basis points. Thus, performing the calculation using BBB- rather than BBB+ rated ten year bonds increases the estimated savings by 18 basis points.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #17

Ref: Page 16

Interrogatory

Does "the provincial government's tendency to use OPG as an instrument of public policy rather than an entity which seeks to maximize profits" also raise issues for lenders to OPG in light of the fact that no explicit provincial guarantee supports the loan?

Response

If we are considering a situation in which OPG remains under provincial ownership, but is able to raise debt independent of OEFC, lenders may consider this issue. However, lenders are likely to recognize that part of the provincial government's public policy is almost certainly an attempt to retain its credit rating; thus, lenders would assume that the provincial government would take steps to assure that OPG debt is repaid regardless of the extent to which public policy mandates suppress equity returns. Therefore, while we agree that lenders would take issues with public policy mandates which undermine the value of their collateral, overall we feel that this concern would be less prevalent among lenders than among (hypothetical) equity holders.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #18

Ref: Page 21

Preamble: LEI indicates that Entergy's independent nuclear company expects to raise $4.5 billion in debt financing when it is spun off from its parent company.

Interrogatory

What is the expected total capitalization of this new independent nuclear company? Are you able to identify what the capital structure and return on equity would have been for this company over the last five years on a stand alone basis?

Response

Based on preliminary indications from rating agencies, it would appear that the capitalization for the new company, to be known as Enexus, will potentially be in the 55% to 65% range. This inference is substantiated by discussions about the potential capitalization of to-be-built nuclear power stations in the US. For example, the developer of a new nuclear plant in Pennsylvania expects to be able to project finance the $7 to $10 billion cost "on an 80:20 debt to equity basis."[14] While such statements regarding capitalization of a yet-to-be licensed nuclear facility are both speculative and in our view somewhat aggressive, they do suggest that expected capitalization in the 55% to 65% for Enexus, which will own a geographically diversified portfolio of existing and operating nuclear stations, is reasonable.

Note that the only point that is being made here is that the current market environment towards nuclear assets is very different, and far more favorable, than it was in years past. There is no need for us to present hypothetical capital structure and return on equity numbers for the past five years for a company which is only now being brought into existence in order for us to make this point. Indeed, Figure 7 on page 21 of our

[14] "CEO Miller: PPL is 'moving rapidly' toward a heavier weighting in merchant generation," *Global Power Report*, March 27th, 2008, p.2

submission makes this clear, in demonstrating how the price paid for existing nuclear plants has increased more than fivefold in the past decade.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #19

Ref: Page 45, Figure 20

Interrogatory

Have any of the merchant generators listed in Figure 20 on page 45 filed for bankruptcy? Which of the companies from Figure 20 have a less than investment grade credit rating?

Response

None of the companies listed in Figure 20 is currently operating under bankruptcy protection. As noted in the table, Calpine emerged from bankruptcy in January of 2008. Mirant has been out of bankruptcy for over two years; NRG has been out of bankruptcy for over four years.

Figure 5. Credit ratings for selected merchant generators

Name	S&P	Moody's	Fitch	DBRS
AES Corporation	BB-	Ba3	BB+	
Calpine Corporation	B	B2		
Canadian Hydro				BBB
Dynegy	B	B3	B	
International Power	BB-	B2	BB	
Mirant	B+	B1	B+	
NRG Energy, Inc.		B+	B+	
Ormat Technologies	n/a	n/a	n/a	
Reliant Energy, Inc.	B	Ba3	BB	
Transalta	BBB	Baa2	BBB	

Source: Bloomberg, as of May 8, 2008

It is worth noting that during bankruptcy the assets of all of these companies continued to exist, continued to operate if economic, and continue to do so today. While previous shareholders were harmed, ratepayers did not lose, and indeed the concept that an investment grade credit rating is essential for ongoing financing of these assets is inconsistent with market realities.

This is born out by the table above. Of the 10 merchant generators listed, only two have an investment grade credit rating. Nonetheless, only three have experienced bankruptcy, while several continue to be among the most dynamic merchant generators today. Since exiting bankruptcy, NRG has acquired nuclear generation assets, and is actively pursuing construction of new nuclear plants. AES is aggressively pursuing renewable generation, even as it continues to be one of the largest conventional generators worldwide.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #20

Ref: Page 43, Figure 19

Interrogatory

Please confirm that the average of the allowed rates of return on equity for the six vertically integrated utilities that have some nuclear generation in their asset mix included in Figure 19 on page 43 is approximately 10.94%? Please provide the S&P credit ratings for each of the vertically integrated utilities in Figure 19.

Response

The average ROE for these six companies is indeed 10.94%. Requested credit ratings appear below. Note that the average ROE for all regulated nuclear owning utilities in the US would likely differ from the sample provided here.

Figure 6. S&P credit ratings for utilities listed in Figure 19 of LEI submission

Entity	S&P
Arizona Public Service Company	BBB-
Detroit Edison Company	BBB
Duke Energy Corp	A-
Entergy Arkansas Inc.	BBB
Florida Power&Light Company	A
Georgia Power Company	A
PacificCorp	A-
Portland General Electric	BBB+
Public Service Company of Colorado	BBB+
Puget Sound Energy	

**no credit rating for Duke Energy Carolinas, used rating for Duke Energy Corp. instead*

Source: Bloomberg, as of May 8, 2008

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #21

Ref: Page 26, Figure 9, prescribed (sic) asset pricing relative to 2007 Ontario price duration curve.

Interrogatory

a) What analysis, if any, did you undertake to determine the differences, if any, between the spot price and the total revenue received from the spot price plus any contracted payments, allocated over all the hours that the contracted units ran, for the unit on the margin in each hour? Please provide any analyses undertaken with working papers.

b) If the contract payments made to units on the margin are material, would your conclusion regarding the appropriateness of the prescribed prices and your assessment of the likelihood of benefit to OPG from prescribed assets change?

Response

(a) Performing such analysis was not necessary to support the conclusions presented in our submission.

(b) We make no conclusion reading the appropriateness of the prescribed prices; this was not part of our mandate. Likewise, we do not "assess… the likelihood of benefit to OPG from prescribed assets." Instead, we note [correctly] that "the fact that the prescribed assets are fully regulated reduces business risks overall"; unlike merchant nuclear or hydro generators, the prescribed assets do not face commodity price risk. Likewise, we simply note the possibility that in some years OPG may earn more under the prescribed asset arrangements than it would as a merchant generator. It is straightforward to prove that this possibility exists using modeling or other quantitative methods at our disposal.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #22

Ref: Page 30

Preamble: On page 30 of your evidence you make the following statement:

"[A]lthough nuclear plants North America-wide do not tend to be any more unreliable than other technology types, the issue is not so much the probability of occurrence as it is the high and possibly unknown cost of the outage when it does occur."

Interrogatory

a) Have you compared the nuclear unit outage probabilities across the units in OPG's nuclear fleet? If so, please provide the results and working papers.

b) Have you compared nuclear unit availabilities across the units in OPG's nuclear fleet? If so, please provide the results and working papers.

c) Given the differences in outage frequency and duration across OPG's nuclear fleet, have you analyzed the extent to which such differences may be attributable to differences in design, components, and materials? If so, please provide the results and working papers.

Response

(a) Our mandate was to create a framework within which relative risks of various assets can be evaluated, not to provide exhaustive analysis of outage probabilities. Overall, to the extent that OPG's outage probabilities diverge from North American norms, while it may be reasonable to argue that some of this risk is technology specific, it is unlikely that all of the difference in performance is beyond management control. Our work focused on risks which appear to be intrinsic to the nuclear industry in North America; to the extent that outage frequency and duration is within management control, deviations from industry norms should not be taken into account when assessing asset-specific risk.

(b) Please see our response to a) above.

(c) Such analysis is clearly not within the scope of our mandate.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #23

Ref: Page 38

Preamble: On page 38 of your evidence you have the following statement:

"Canadians also invest non-trivial amounts in the United Kingdom, where allowed returns to wires companies are much lower." (than in the United States)

Interrogatory

a) What has the U.K inflation rate been during the past decade?

b) How do the 7 and 7.5 %, for transmission and distribution respectively, **post tax real** rates reported in Figure 15 as OFGEM's rate for wires only companies relate to Hydro One's rates, and to the rates listed for U.S. wires only companies?

Response

a)

Figure 7. UK retail price inflation rate

Year	All items	All items excluding housing
1998	3.4	2.2
1999	1.5	1.7
2000	3	1.5
2001	1.8	1.5
2002	1.7	1.4
2003	2.9	1.7
2004	3	1.2
2005	2.8	1.6
2006	3.2	2.6
2007	4.3	2.7
average	***2.76***	***1.81***

source: UK Office for National Statistics

b) When adjusted for inflation and tax effects, the numbers continue to be below those for Rochester Gas and Electric, for example, and well below the rates allowed for US transmission in recent FERC cases.

Board Staff
Interrogatory Reponses to Ontario Power Generation ("OPG")

OPG INTERROGATORY #24

Interrogatory

Please provide a table showing:

a) the recommended returns on equity and capital structure in each case in which LEI (A. J. Goulding) has appeared since 2000

b) the date of the testimony

c) the client on whose behalf the testimony was prepared

d) the regulatory jurisdiction

e) the date of the decision

f) the awarded returns on equity and capital structures – if the case resulted in a settlement, please so indicate.

Please provide copies of all testimonies and accompanying schedules for each of the proceedings listed in the table.

Response

Mr. Goulding's academic expertise and regulatory advisory work related to cost of capital issues is based on a decade of direct experience in advising on power sector acquisitions. Over the past decade, Mr. Goulding has advised on over 45 power sector transactions worldwide, giving him direct exposure to the actual hurdle rates and leverage achieved across myriad power sector asset types and locations. The advice that Mr. Goulding provides has a direct impact on how power sector assets are financed; real dollars (or euros, yen, or yuan, in the case of his recent international clients) are made or lost based on the advisory work he and his team perform. This means that in addition to being able to calculate the cost of capital according to traditional academic principles, and having the ability to critique those principles, Mr. Goulding has access to a wealth of practical information about how investors actually behave.

A description of a sample of the transactional advisory work that Mr. Goulding has done appears in the figure below. Client names and full project details are subject to client confidentiality.

Figure 8. Sample of Mr. Goulding's transactional experience

acquisition of portfolio of coal fired stations in New York
proposed acquisition of Ontario MEU
leasing of Ontario nuclear station
proposed acquisition of Southeastern US utility
finacial viability of French CCGT
leasing of Dutch electricity network
leasing of Dutch gas network
bid for New York power station
acquisition of US hydro portfolio
valuation of New York IPP
valuation of Asian generation portfolio
debt financing of New England generation portfolio
assessment of cost of capital for Alberta transmission company
leasing of German electricity company
leasing of Austrian generation portfolio
advised on development and financing of California biomass plant
provided revenue analysis for a developer of hydro stations in BC
supported proposed creation of income trust from Ontario assets
advised on financing of hydro plant in Maine
assessed potential changes in value for an IPP in New England
advised Quebec-based small hydro facility on financing and revenue analysis
advised on prposed acquisition of Mexican and Philippine assets
advised on acquisition of Singapore generator

leasing of Austrian distirbution network
acquisition of Ontario hydro portfolio
leasing of Austrian transmission assets
valuation of partnership interest in IPP
proposed acquisition of mid-atlantic US vertically integrated utility
acquisition of New England pumped storage facility
proposed acquisition of New England hydro and gas portfolio
leasing of European district heating assets
proposed acquisition of Ontario transmission and distribution company
valuation of portfolio of Caribbean and Philippine generation assets
valuation of IPP
acquisition of Romanian distribution company
leasing of Austrian small hydros
examination of economics of Ontario cogeneration facility
wrote market section of offer memo for Canadian hydro-focused income trust
valuation of Canadian hydro and biomass generation company
Pacific Northwest IPP merchant analysis
PJM cogeneration plant analysis
proposed acquisition of New York City generation portfolio
assessment of economics of Michigan cogeneration facility
wrote market section of offer memo for Alberta wind-focused income trust
reviewed economics of Ontario cogeneration facility

Mr. Goulding has also advised a number of regulators outside of North America, including the Argentine national electricity regulator, the Special Administrative Region of Hong Kong and the Electricity and Cogeneration Regulatory Authority of Saudi Arabia. His reports for these clients are not public.

As an adjunct assistant professor at Columbia University's Center for Energy and Marine Transportation, at the School of International and Public Affairs, Mr. Goulding is able to transfer some of this knowledge to public policy graduates, some of whom go on to become future electricity regulators. Mr. Goulding has also provided training seminars, including discussion of cost of capital issues, to the Development Bank of Japan, the Romanian regulatory authority, and the World Bank, among others.

Board Staff
Interrogatory Response to GEC-Pembina-OSEA

INTERROGATORY #1

Mr. Chernick in his evidence states:

> There are at least two benefits of separate costs of capital for OPG's two lines of business. First, if the OEB establishes separate costs of capital and the mix of OPG's investment changes, due to nuclear retrofits or refurbishment or new nuclear or hydro capacity, OPG's average allowed return would automatically shift in the direction of the investment mix. The return would only need to be updated for changes in market rates or the underlying risk in either OPG business segment. Second, when OPG is reviewing options for capital investments—capital to reduce operating cost, capital to increase output, capital to extend operating lives—it's analysis should reflect the different costs of capital for nuclear and hydro investments.

Please comment on this suggestion of distinct costs of capital for the nuclear and hydraulic businesses on the rationale above and on the compatibility of that approach with the cost of capital proposal you have made. Assuming that the combined cost of capital would equal the value you have recommended for the initial rate period, what spread between the two divisions would you suggest (for both ratio and ROE as appropriate) if such a spread were to be utilized by the Board?

Response

Mr. Chernick is theoretically correct – if two different sets of assets have different risk profiles, a different cost of capital should be attributed to each. While it is important to avoid fallacies of misplaced precision, and to balance the administrative costs (if any) of maintaining separate ROEs and capital structures for the two asset classes, in general it may be appropriate to have distinct structures and returns for the two assets.

We would expect that the hydro assets would potentially have the ability to achieve higher debt to capital ratios, and to be attributed lower required equity returns, than the nuclear assets. However, were the current structure of deferral and variance accounts to remain in place, the deemed difference in returns and debt carrying capacity may be small.