

**REVIEW OF DEMAND SIDE MANAGEMENT
(DSM) FRAMEWORK FOR NATURAL GAS
DISTRIBUTORS**

RESPONSE TO STAKEHOLDERS' WRITTEN QUESTIONS

Prepared for:

The Ontario Energy Board

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INTRODUCTION

Pursuant to the Ontario Energy Board's ("OEB") letter of May 5, 2010, Concentric Energy Advisors ("Concentric") provides answers to written questions regarding its report entitled *Review of Demand Side Management (DSM) Framework for Natural Gas Distributors* dated March 19, 2010 ("Report").

Consistent with the Board's May 5, 2010 letter, Concentric has responded to those questions which request clarification of the research, analysis, recommendations, and underlying rationale contained in the March 19th Report. Concentric has not responded to a relatively few questions that fell into the following categories:

- 1) Those which require additional research or analysis;
- 2) Those which were adequately covered during the stakeholder meeting on April 29; and
- 3) Those which are beyond the scope of the original report, including those which appear to require a Board policy decision.

Due to the importance of this topic for the Board and stakeholders, Concentric has endeavored to provide answers to all other questions based on the research and perspective underlying our March 19th report.

Concentric's responses are organized by topic. Each question is numbered sequentially, followed by a cross-reference to the stakeholder that asked the question. For purposes of this document, we have used the following abbreviations to refer to stakeholders:

BOMA/LMPA – Building Owners and Management Association/London Property Management Association
CCC – Consumers Council of Canada
EGDI – Enbridge Gas Distribution Inc.
EP – Energy Probe
GEC – Green Energy Coalition
SEC – School Energy Coalition
Union – Union Gas Limited
VECC – Vulnerable Energy Consumers Coalition

The views expressed in this report are those of Concentric Energy Advisors and do not necessarily represent the views of, and should not be attributed to, the Ontario Energy Board, any individual Board member, or OEB staff.

GENERAL QUESTIONS

Question 1 – (BOMA/LMPA Question 1.A)

The report indicates that jurisdictions in the U.S. were chosen because they were determined to be states which had the highest per capita spending on gas DSM programs.

Does Concentric have any empirical data that there is a high degree of correlation between per capita spending and per capita reduction in gas use?

No, Concentric did not examine the correlation between per capita spending and per capita reduction in gas use. As indicated in Footnote 4 on page 12 of the Report, the benefit of our U.S. sample is that states which spend more on gas DSM programs are likely to have gained more experience in terms of designing a regulatory framework that contributes to the success of energy efficiency.

Question 2 – (BOMA/LMPA Question 1.A)

If Concentric had chosen jurisdictions in the U.S. that were determined to be states which had the most effective per capita impact on gas use resulting from DSM programs, would the same states have been chosen?

This question would require additional research.

Question 3 – (BOMA/LMPA Question 2.A)

The report indicates that 11 of the 34 states with energy efficiency programs allow utilities to earn a financial reward or profit on the operations of natural gas energy efficiency programs. Is this number increasing, decreasing, or remaining relatively flat over the past number of years?

Concentric has not studied the trend over time of programs that offer utilities the opportunity to earn incentives for DSM and energy efficiency performance. We note, however, that relatively new LDC DSM and efficiency programs (e.g., Connecticut) continue to implement incentive structures into program design. In addition, established programs (e.g., California) continue to make incentive rewards after many years of DSM and energy efficiency experience.

Question 4 – (BOMA/LMPA Question 2.B)

What are the reasons given, if any, for using a stand-alone energy efficiency tariff or a surcharge on the customer bills instead of recovering the costs in base rates?

As stated in “Update on Regulatory Approaches to Promoting Energy Efficiency” (American Gas Association, May 2009), “tracking costs and recovering energy efficiency expenditures through a tariff or rider tends to provide for matching of program costs with program expenses, while inclusion of costs in base rates leads to either over-recovery or under-recovery of program costs. A surcharge mechanism that does not involve a lengthy deferral period, or that includes the recovery

of carrying costs if the deferral period is more than a month, is viewed by respondents as a reliable mechanism for direct program cost recovery.”

Question 5 – (BOMA/LMPA Question 2.C)

Do any jurisdictions use a stand-alone energy efficiency tariff with an increasing block structure so that more of the cost of DSM programs is paid for by customers with higher consumption? If yes, please provide details.

This question would require additional research.

Question 6 – (CCC Question 1)

Has Concentric been retained by the Board or Board Staff to provide advice? Will Concentric be directly advising the Board throughout this consultation process? Has Concentric ever provided advice to Union or Enbridge regarding its DSM plans? If so, please explain the nature of that advice.

As noted on page 9 of the Report, Concentric was retained by the OEB to critically review, compare and assess Ontario’s DSM framework for natural gas distributors with respect to best practices in selected North American and other jurisdictions and to make recommendations on what changes, if any, should be made to the DSM framework. This was accomplished through the Report that was provided to the Board on March 19, 2010, and through our participation at the Stakeholder Meeting on April 29, 2010. Concentric does not anticipate that it will be directly advising the Board throughout the consultation process. Concentric has never been engaged by Union or Enbridge to provide advice regarding their respective DSM plans.

Question 7 – (CCC Question 2)

p. 22 - The paper states that the Board’s objective to promote energy efficiency and gas conservation must be balanced with regard for the economic circumstances of provincial energy customers, highlighting the importance of participant costs and rate increases associated with efficiency programs. How specifically does Concentric propose that be done?

As discussed throughout the Report, Concentric has provided a series of recommendations that offer the Board a menu of options for measuring cost effectiveness, developing and monitoring input assumptions, determining adjustment factors, designing DSM programs, establishing DSM budgets, measuring DSM program success, accounting for lost revenues associated with DSM programs, and granting shareholder incentives for achievement of program objectives. However, the ultimate decision for how to design a DSM framework that balances the objectives set forth in the Green Energy Act with the economic circumstances of provincial energy customers rests with the Board. Table 3 of Concentric’s report provides the Board with a range of possible regulatory approaches depending on the policy objectives.

Question 8 – (CCC Question 3)

p. 22 -The paper refers to the provision in the Act that allows gas distributors to collect amounts assessed to them by the Ministry of Energy and Infrastructure for energy conservation and renewable energy programs from their customers. If this is put in place for natural gas distributors

how would this impact Concentric's views on the appropriate level for DSM budgets? If, for example, gas distributors were required to collect \$50 million per year for these programs, would this be included in the recommended 4-6% of distribution revenue? If not, why not? Would these amounts have to be considered when considering the rate increases arising from DSM programs?

If the \$50 million collected by gas distributors in CCA's example went toward spending on energy conservation and renewable energy programs, then Concentric would expect that the portion of this \$50 million that was attributable to gas DSM programs would be included in the recommended 4-6% budget calculation. Yes, these amounts should be considered in terms of overall rate impact.

Question 9 – (CCC Question 4)

p. 27 -The paper refers to the fact that some utilities use a "performance target incentive." Please explain how these incentives work and the level of incentives under this approach.

This information was reported by the AGA in its May 2009 summary entitled "Update on Regulatory Approaches to Promoting Energy Efficiency." Concentric did not investigate each specific finding contained in the literature review section of our report. Rather, that section provides a broad overview of the current status of energy efficiency, conservation and demand side management programs in Canada and the U.S. Concentric cannot respond to this question without performing additional research.

Question 10– (CCC Question 5)

p. 27 -The paper refers to the fact that four utilities use a rate of return adder approach. Please explain how this approach works.

This information was reported by the AGA in its May 2009 summary entitled "Update on Regulatory Approaches to Promoting Energy Efficiency." Concentric did not investigate each specific finding contained in the literature review section of our report. Rather, that section provides a broad overview of the current status of energy efficiency, conservation and demand side management programs in Canada and the U.S. Concentric cannot respond to this question without performing additional research.

Question 11 – (EGDI Question 1)

What weight did Concentric give to stakeholder comments, considering that those comments were gathered over a year ago and before passage of the *Green Energy Act*?

Concentric used the stakeholder comments to identify the most important issues and perspectives of the parties for each of the fourteen critical elements identified by the Board. With this background, and our understanding of the existing Ontario DSM programs, Concentric relied on our research of other jurisdictions and our industry expertise to develop the recommendations for each of the fourteen critical elements. In doing so, we were mindful of the Green Energy Act, as described on page 22 of the Report. Our research methodology is more fully described on pages 11-15 of the Report.

Question 12 – (EGDI Question 2)

Reference page 17

Did Concentric review DSM principles developed in Ontario in consultation with the Board, utilities and stakeholders, e.g., principles from EBO 169 and in later Decisions of the Board? If so, please identify the specific principles relied upon or rejected.

As indicated on page 20 of the Report, Concentric reviewed the Board's reports and decisions in EBO 169 and in EB-2006-0021. While these reports and decisions informed our understanding of the DSM Framework in Ontario, the purpose of our Report was to critically review, compare and assess Ontario's DSM framework for natural gas distributors with respect to best practices in selected North American and other jurisdictions and to make recommendations on what changes, if any, should be made to the DSM framework. Therefore, we developed our own set of guiding principles which we used to arrive at our ultimate recommendations. Those are presented on page 17 of the Report.

Question 13 - (EGDI Question 3)

Reference page 17

What process did Concentric use to develop the guiding principles? Was Concentric given direction for this aspect of its work? If so, please describe.

Concentric developed these guiding principles based on our review of the approaches taken in other jurisdictions that were included in our sample, as well as our collective regulatory experience. The primary purpose of establishing our guiding principles was to emphasize the importance of developing a comprehensive and cohesive DSM framework, which recognized that the fourteen critical elements are interdependent. Concentric was not given any direction for this aspect of its work. This is described more fully in pages 12-15 of the Report.

Question 14 – (EGDI Question 4)

At page 17 of the Concentric Report, it states that Concentric's suggested direction among the various options is based upon its understanding and interpretation of Ontario's provincial policies on energy and the environment. Please define and list the provincial policies to which Concentric refers.

As enumerated on pages 22-23 of the Report, Concentric's recommendations are based upon our understanding and interpretation of the Green Energy Act, Ontario's 2007 Action Plan on Climate Change, and the Environmental Commissioner of Ontario's December 2009 report entitled "Annual Greenhouse Gas Progress Report 2008/2009."

Question 15 – (EGDI Question 5)

Reference page 18

At page 18 of the Concentric Report, it states that “Concentric believes it is important for the OEB to set forth well articulated policy objectives for its energy efficiency and conservation program.” Is Concentric of the view that the Board has not to date articulated its policy objectives, and if so, in what areas does Concentric have this concern? Was Concentric provided with a list of policy objectives? If so, please produce.

This statement is not intended to imply that the Board has failed to set forth well articulated policy objectives in the past. Rather, as stated on page 18 of the report, Concentric recognizes that the Province’s objectives for energy efficiency and climate change are ambitious, and will require all stakeholders to cooperate in the interest of attaining the most successful DSM program results possible. For that reason, we believe it is important for the Board to continue to provide leadership by developing a DSM Framework that sets well-defined objectives.

Concentric was not provided with a list of policy objectives.

Question 16 – (SEC Question 1)

Who are the authors of the Report? Could you please provide their CVs, including lists of publications and speaking engagements, and representative consulting assignments?

The Concentric report was written by Jim Coyne (Senior Vice President), John Trogonoski (Project Manager), and Mark Cattrell (Senior Consultant). Resumes are provided in Attachment A.

Question 17 – (SEC Question 2)

Note 4 on page 12 discusses the choice of the US sample group. To what extent should the averages of data from that sample be discounted because of the selection criteria?

Concentric does not believe that the averages should be discounted because of the selection criteria. Concentric has acknowledged in the report that the US sample group was deliberately chosen to represent those states that have the most aggressive per capita spending on DSM programs. This suggests that these jurisdictions have the most experience with DSM programs and are most likely to represent the sample group that follows “best practices” in terms of designing and implementing an effective regulatory framework for DSM.

Where in the Report you have provided averages, can you also provide averages for all utilities, not just those in your sample group?

This question would require additional research. For purposes of clarification, the averages presented in our report are primarily for the sample group, although in some cases we have reported averages for broader sample groups. In most instances, the averages pertain to that sample group because that was the focus of our research for the aforementioned reasons. However, there were some instances where we had broader data, and those data were reported as represented. When

there are data differences between states, we have made every possible effort to report that data on an apples to apples basis.

Question 18 – (SEC Question 3)

In a number of places throughout the Report Concentric appears to propose more involvement by the OEB in the DSM process, including plan approval, target-setting, and evaluation and audit, etc. Could you provide a summary of how you are proposing to change the role of the OEB, including the specific changes in responsibility, the additional resources required, and any other implications?

As indicated on page 132 of the Report, Concentric recommends that the Board appoint the program evaluator(s) and the program auditor. We have further recommended that the Board consider assigning one or two OEB staff members to oversee the DSM program and evaluation audit process, thereby minimizing the impact of this recommendation on the Board's limited resources.

Question 19 – (SEC Question 4)

Is any of the data contained in the survey results (e.g. “savings of 9% of total natural gas usage”) on page 26 based on empirical data, or are they in all cases a summary of the estimates provided by survey participants?

The data are based on a summary of estimates provided by survey participants.

Issue #1: Cost Effectiveness Test

Question 20 – (CCC Question 6)

p. 47 - Concentric has recommended use of the SCT. Please explain the process that would be undertaken to monetize the externalities used in the test. How would this be consistent with the desired objective to "keep it simple"? How often would those values be reviewed? How do you measure things like increased health and comfort?

The appropriate mechanism for handling societal costs is the existing methodology for DSM plan input assumptions: these costs are estimated by distributors, reviewed by the Board, with opportunity for stakeholder input, and updated every three years. At the outset, the Board, with technical support, may wish to prioritize the externalities that should be quantified, and suggest starting parameter values (e.g., \$/ton for carbon). Concentric recognizes that additional inputs create complexity, but with the passage of time, agreement on reasonable parameter values should ease this incremental burden. Arguably, increased health and comfort is difficult to quantify. Economists sometimes rely on revealed preferences to estimate such factors.

Question 21 – (CCC Question 7)

p. 48 - The paper refers to pilot programs. What are Concentric's recommendations regarding pilot programs? How should pilot programs fit into an overall DSM budget? What criteria should be used by utilities in determining whether pilot programs are justified?

As indicated on page 48 of the Report, Concentric recommends that pilot programs are an effective way for the Board to test the effectiveness of innovative technologies that may not pass the traditional cost effectiveness screen. As noted in the Report, Concentric recommends that the Board should reserve the opportunity to review the success of these pilot programs within two or three years. Concentric endorses Minnesota's approach of targeting a small percentage of the DSM budget for special funding for research and development efforts.

Question 22 – (EGDI Question 6)

Does Concentric agree that the number of programs that will pass the Societal Cost Effectiveness (SCT) Test will be directly linked to the value placed on GHG emissions? Does Concentric agree that a low value for GHG emissions will result in no material increase in program offerings?

Concentric agrees that there is a correlation between the value placed on GHG emissions and the number of DSM programs that would be considered cost effective under the Societal Cost Test. Concentric did not examine the relationship between the value of GHG emissions and the number of program offerings for purposes of this report. The answer to the second part of this question would depend on the current benefit/cost ratio of each individual program not including a value for GHG emissions. If the individual DSM program is slightly below 1.0, then the inclusion of a low value for GHG emissions could potentially make that program cost-effective under the SCT. Conversely, if the individual DSM program has a benefit/cost ratio well below 1.0, then the inclusion of a low value for GHG emissions would most likely not cause that program to become cost effective under the SCT.

Question 23 (EGDI Question 7)

Please provide a detailed list of all of the costs and benefit components used for the Program Administrator test that Concentric proposes that gas utilities undertake. In particular, please describe the components included in “avoided supply costs of energy and demand” listed on page 41.

Benefits and costs that may be assessed in administration of the Program Administrator Cost Test are described in the California Standard Practice Manual.¹

Benefits include:

- Avoided supply costs of energy and demand
- The reduction in transmission, distribution, generation, and capacity valued at marginal costs for the periods when there is a load reduction
- For fuel substitution programs, benefits include the avoided supply costs for the energy-using equipment not chosen by the program participant only in the case of a combination utility where the utility provides both fuels

Costs include:

- Program costs incurred by the administrator
- Incentives paid to the customers,
- Increased supply costs for the periods in which load is increased
- Initial and annual costs, such as the cost of utility equipment, operation and maintenance, installation, program administration, and customer dropout and removal of equipment (less salvage value)
- For fuel substitution programs, costs include the increased supply costs for the energy-using equipment chosen by the program participant only in the case of a combination utility.

Question 24 – (GEC Question 1.A)

Please confirm that we have correctly understood Concentric’s views on the following points:

As typically applied in North America today, both the societal cost test (SCT) and the total resource cost test (TRC) do not capture societal non-energy benefits realized by program participants, including such things as improved comfort, improved health and safety, improved worker productivity, reduction in waste streams, etc. Thus, both tests often significantly understate true societal benefits of DSM.

Concentric believes that the above-mentioned externalities are difficult to quantify. As a result, Concentric agrees that the SCT and TRC test do not capture non-energy benefits, and consequently tend to understate the true societal benefits of DSM.

Question 25 – (SEC Question 5)

¹ State of California, Governor’s Office of Planning and Research, “California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects,” July 2002, at 24.

Please expand on why Concentric is proposing one test, the Societal Cost Test, for “cost effectiveness”, but another test, called in some places the Program Administrator Test and in other places Modified TRC, to prioritize programs. How is this supposed to work in practice?

See pages 46-47 of the report. Concentric proposes the use of the Societal Cost Test for two important reasons. First, it includes the impacts of externalities, the most important of which is carbon. Second, it incorporates a lower discount rate, the societal discount rate, which we believe is appropriate given the societal benefits of these programs. However, we are mindful that a Societal Cost Test screen may result in an increase in accepted DSM program measures over those currently screened through the TRC test. We have also recommended a budget level for DSM spending of 4-6%. In the event that the program expenditures justified by the Societal Cost Test would exceed that 4-6% range, we suggest the Program Administrator test as the means to prioritize which programs get funded first until such time as eventual program expenditures would catch up to all those that are justified by the Societal Cost Test.

Why are two tests that will produce quite different results being employed? How will conflicts between the two tests be dealt with?

The SCT is the first and primary screen. The PAC test serves as a governor, determining the prioritization of program funding when annual budget limits are reached. If a program passes the SCT, but is limited in a given year by the PAC, it should be funded in a subsequent year. This is described in greater detail on pages 46-48 of our report.

What other jurisdictions use the two tests in the way Concentric is proposing to use them?

Most jurisdictions in our research sample use more than one benefit/cost test, with some serving as primary and others serving as secondary. See table 10 in our report.

Question 26 – (SEC Question 6)

Elsewhere in the Report, Concentric discusses “cream skimming” and expresses concern about the lack of program with deep savings. Please confirm that the Program Administrator Test generally motivates distributors to “cream skim”. What steps, if any, should be taken to prevent the use of this test from causing excessive cream skimming?

Concentric believes that most cost effectiveness tests encourage cream skimming. However, our recommendation to use the Societal Cost Test would include a much broader array of programs, allowing for deeper savings than just a PAC test or a TRC test alone. We expect that using the Societal Cost Test as the primary screen in conjunction with increased DSM budgets will broaden the program to include deeper energy savings initiatives. The Societal Cost Test, our primary cost effectiveness test, is designed to allow the Board to implement policy decisions that encourage the pursuit of deep savings.

Concentric’s low income recommendation endorses the British style “neighborhood approach” under which both electric and gas utilities cooperate by offering holistic DSM initiatives, which allows for deeper and longer term savings than those achieved under a traditional approach. Many of these approaches will be justified under the Societal Cost Test that may not have otherwise passed under the TRC approach.

Question 27 – (SEC Question 7)

What is the basis for the adders in Iowa and Colorado to replace externalities, as discussed on page 44 of the Report? What externalities are covered by those percentages?

In Iowa, an externality factor (“EF”) is applied to the net present value of benefits in a cost benefit analysis of DSM programs. According to Chapter 35 of the Iowa state administrative code, Section 199, part 35.9(7), the purpose of the EF is “to account for societal costs of supplying energy.” What these costs are, however, is not described. The externality factor, as codified in law, is a method by which the state accounts for all societal externalities associated with energy.

Similarly, in Colorado a 5% adder is applied to TRC test results in order to capture “‘other benefits’ of conservation that are not captured by the TRC, like avoided emissions and other societal benefits” (Docket No. 09R-222G, p 5).

Question 28 – (SEC Question 8)

What is the impact of including environmental externalities in the calculation of cost effectiveness? Based on the Report, the 51.4 megatonnes of carbon caused by natural gas use in Ontario would, at only \$20 per tonne, total over a billion of theoretically potential externalities annually. A 2% reduction in use would be more than \$20 million of GHG savings. How much of this does Concentric expect would be included in the benefits from DSM programs if the Societal Cost Test is employed? What other major externalities would be expected to increase the calculated benefits using this test?

Concentric has not estimated the incremental externality cost savings resulting from the adoption of the Societal Cost Test. As shown on Table 23, page 107, our research has indicated that DSM programs in the jurisdictions covered by our research have achieved up to 1% annual reductions in gas consumption, and many of the jurisdictions are using the Societal Cost Test. Table 15, page 89, demonstrates that these utilities are spending near 6% of distribution revenue on DSM. Our recommended budgets for Ontario of 4-6% might achieve similar reductions in gas consumption, depending on the specific programs and their effectiveness. This would suggest \$10 million of annual carbon savings at \$20/ton. Beyond carbon, other externalities that might be factored include: improved comfort, or reduction of bad debt expense from low income consumers (see page 47 of the Report).

Question 29 – (SEC Question 9)

Can you walk us through the calculations you used to propose a .60 to .75 SCT threshold for low-income tests, and compare that to what that would likely mean in TRC or PAC terms?

On page 47 of the Report, Concentric recommends that the Board consider adopting a Societal Cost Test threshold for low-income programs of 0.60 to 0.75. This range is somewhat more aggressive than the 0.80 TRC result used in British Columbia, but more conservative than the 0.25 modified Participant Test result adopted in California. The recommended range of 0.60 to 0.75 is higher because it utilizes the Societal Cost test (which includes externalities), while the range in other jurisdictions relates to the TRC test or the Participant test (which do not include externalities).

Concentric's recommendation is not based on precise calculations, but rather attempts to establish a range of reasonableness/balance of priorities. The important consideration is not what the exact benefit/cost ratio should be, but the principle that the Board should approve low-income programs with a benefit/cost ratio below 1.0.

Question 30 – (SEC Question 10)

Please explain how the use of cost effectiveness testing on a program basis “limits the flexibility of the Board to approve specific DSM programs as new technologies emerge”.

The full context of the statement is important. As noted on page 48:

“Finally, Concentric recommends that the Board apply the cost effectiveness test on a program basis rather than a portfolio basis. We believe that each individual DSM program or measure should be evaluated on its own merits, and that the Board should favor those programs and measures which are most cost effective. A portfolio approach is not recommended because we believe that it tends to blur the distinction between more effective programs and less effective programs, and it limits the flexibility of the Board to approve specific DSM programs as new technologies emerge and as policy objectives change. Although the utilities have expressed concern that applying the cost effectiveness test on a program basis discourages them from pursuing more innovative technologies, Concentric believes that concern can be addressed through approval of special funding for research and development efforts (similar to what is done in Minnesota) and for pilot programs that may not have benefit/cost ratios greater than 1.0, as long as the Board has an opportunity to review the success of those programs within two or three years.”

We believe that the distributor will be seeking to have a portfolio and individual programs with SCT results as high as possible. If the distributor wishes to propose a program (e.g., a pilot or R&D type program) with lower SCT results, but longer term potential benefits, we feel it's important for the utility to bring these plans forward and for the Board to have flexibility in approving them, without concern for the impact on the core program portfolio.

Question 31 – (SEC Question 11)

Can you describe the Minnesota “special funding”, and how Concentric believes it should be applied in Ontario?

Section 216B.241 of the Laws of Minnesota authorizes the Commissioner of Commerce to:

order, approve and make grants for applied research and development projects of general applicability that identify new technologies or strategies to maximize energy savings, improve the effectiveness of energy conservation programs, or document the carbon dioxide reductions from energy conservation programs. When approving projects, the commissioner shall consider proposals and comments from utilities and other interested parties. The commissioner may assess up to \$3,600,000 annually for the purposes of this subdivision. The assessments must be deposited in the state treasury and credited to the energy and conservation account created under subdivision 2a. An assessment made under this subdivision is not subject to the cap on assessments provided by section 216B.62, or any other law.

In Minnesota, the Commissioner of Commerce works closely with the Public Service Commission to promote the state's energy efficiency policies through the administration of programs including the special funding for innovative technologies. The Ontario Energy Board could perform a similar role in Ontario if it is established that innovative and advanced technologies should be promoted using a similar funding mechanism in Ontario. To provide simpler and more efficient implementation of such a program, we would not recommend the formation of a separate agency to operate this type of program in Ontario.

Question 32 – (SEC Question 12)

Can you estimate the impact of Concentric's proposed change to the discount rate on the TRC for each of Enbridge and Union, using their audited 2008 Evaluation Reports as the baseline?

This question requires additional research and analysis, and is beyond of the scope of the Report.

Question 33 – (Union Question 1)

Recognizing that, at the program level, program and incentive costs are related to the number of participants, how would Concentric recommend establishing the participation levels to be used in the Societal Cost Test ("SCT") and Program Administrator Cost ("PAC") tests respectively?

Participation levels should be estimated by the distributor based on initially estimated program spending, assumed participation rates based on prior experience, the input assumptions developed for the Board, and then adjusted through the evaluation reports. Between program cycles (three years) the distributor should be reasonably able to shift dollars (and incentives) between programs as participation rates vary from expected rates.

Question 34 – (Union Question 2)

Does Concentric recommend the PAC test be used to prioritize programs within each sector, or is Concentric recommending the prioritization be applied across the entire DSM resource acquisition portfolio recognizing the potential result that the portfolio may not provide DSM programs to all sectors?

As indicated on page 46 of the Report, Concentric recommends that the Board consider using the Program Administrator Cost test to prioritize the proposed DSM programs and measures. Priority would be given to those program and measures with the highest PAC test results, thereby aligning DSM targets with DSM spending. As the question suggests, this could result in the gas distributor shifting DSM programs between sectors. However, from Concentric's perspective, the most important consideration is to prioritize DSM program according to those which offer maximum benefits compared to the cost of the program or measure. In this way, the Board would be approving those energy efficiency programs that were the most cost effective and which offered the greatest potential for energy savings per dollar spent.

Question 35 – (Union Question 3)

Recognizing that the gas distributors are aware of changing market conditions due to their ongoing interaction with customers and market actors, please confirm that Concentric

recommends that the utilities maintain a degree of flexibility in prioritizing the DSM programs delivered to the market?

Concentric agrees. Please see the response to Union Question 1 (Question 33).

Question 36 – (Union Question 4)

How would Concentric's screening and prioritization recommendations relate to behavioural and market transformation programs which are not formulaic in nature?

Screening these programs requires estimates of the benefits, which are more difficult to measure than for typical resource acquisition programs. Estimates may be derived from a combination of input assumptions developed for the Board by its independent consultants and ongoing experience, confirmed with the evaluation reports. The dollars expended for these programs are significantly less than for resource programs, which diminishes, but does not eliminate these common estimation problems.

Question 37 – (VECC Question 1.A)

Is there a standardized method(s)/software for Prescriptive programs (e.g. California Manual. If so cite source(s)

In California there is a web-based database software tool that contains documented estimates of DSM intervention metrics for a suite of prescriptive program offerings.
From: <http://www.energy.ca.gov/deer/index.html>.

The Database for Energy Efficient Resources (DEER) is a California Energy Commission and California Public Utilities Commission (CPUC) sponsored database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) all with one data source. The users of the data are intended to be program planners, regulatory reviewers and planners, utility and regulatory forecasters, and consultants supporting utility and regulatory research and evaluation efforts. DEER has been designated by the CPUC as its source for deemed and impact costs for program planning.

Question 38 – (VECC Question 1.B)

Are there standard input assumptions e.g. discount rates, or do these vary from jurisdiction to jurisdiction?

Concentric's research of other jurisdictions indicates that input assumptions such as discount rates tend to vary. For example, Table 11 on page 45 of the Report presents the methodology used to derive the discount rate in nine U.S. states that were included in our research sample. Likewise, assumptions regarding useful life, free-ridership rates, payback periods, and annual energy savings also tend to vary from jurisdiction to jurisdiction.

Question 39 – (VECC Question 1.C)

How do Ontario's current input assumptions and those recommended by CEA for TRC/SCT calculations rank with other jurisdictions.

This question would require additional research for the majority of input assumptions. On the issue of the discount rate, as indicated on page 54 of the Report, Concentric recommends that the OEB consider adopting the societal discount rate based on the average yield on the Government of Canada long bond over a specified number of months, rather than using the utility's weighted average cost of capital as the discount rate. Based on our research of other jurisdictions, the societal discount rate would be consistent with a more progressive/aggressive regulatory approach to DSM programs.

Question 40 – (VECC Question 1.D)

Has CEA assessed how changes recommended to input assumptions for TRC/SCT calculation affect the following:

- i. Gross/Net TRC
- ii. Targets
- iii. Incentives

Concentric has not assessed how our recommended changes to input assumptions (e.g., different adjustment factors for free ridership/spillover, a different discount rate, etc.) would affect the cost effectiveness test, DSM targets, or shareholder incentives. This would require a quantitative analysis of the TRC/SCT calculation, whereas the scope of our research was more qualitative in nature. That is, Concentric examined the regulatory approach to the fourteen elements in other jurisdictions, and applied those findings to our understanding of Ontario's circumstances in order to develop recommendations.

Question 41 – (VECC Question 1.E)

Please provide an opinion whether monetization of GG emissions at \$15/tonne or higher based is appropriate for Ontario, given the primary energy resource mix (e.g., fossil vs renewable) and/or natural gas use?

This question is beyond the scope of Concentric's Report, and would require additional research and analysis.

Question 42 – (VECC Question 2.A)

Does CEA agree that deeper measures have inherently low TRC/SCT if classed as Resource Acquisition measures what alternatives are in use e.g. LIPPT

As a general premise, deeper measures are likely to have longer paybacks, but depending on the magnitude of energy saved, and using a SCT test, these programs may not necessarily have lower SCT test results. With a TRC test, a lower test result is more likely.

Question 43 – (VECC Question 2.B)

What is the Basis of SCT range 0.6-0.75? Did CEA evaluate existing LI programs on that Test?

On page 47 of the Report, Concentric recommends that the Board consider adopting a Societal Cost Test threshold for low-income programs of 0.60 to 0.75. This range is somewhat more aggressive than the 0.80 TRC result used in British Columbia, but more conservative than the 0.25 modified Participant Test result adopted in California. Concentric's recommendation is not based on precise calculations, but rather attempts to establish a range of reasonableness/balance of priorities. The important consideration is not what the exact benefit/cost ratio should be, but the principle that the Board should approve low-income programs with a benefit/cost ratio below 1.0.

Concentric did not evaluate the existing low-income program in Ontario based on our proposed Societal Cost Test. That would have been beyond the scope of our assignment.

Question 44 – (VECC Question 2.C)

Does CEA have examples of non-TRC/SCT Scorecards in current use? If so, provide sources.

Concentric is not aware of any jurisdictions that use a non-TRC/SCT scorecard to assess cost effectiveness.

Question 45 – (VECC Question 2.D)

Does CEA support Scorecard approach as an alternative to TRC? If so give examples of the types of programs/measures that could be suited to scorecards.

As stated in our report, Concentric believes that the Societal Cost Test is the most appropriate alternative to the TRC test to select cost effective programs. Concentric recommends that the Board consider adopting a different Societal Cost Test threshold for low-income programs. This methodology will permit the Board to implement DSM programs that are consistent with broader Provincial policy objectives, including the provision of energy efficiency services to low-income customers.

Question 46 – (VECC Question 2.E)

How should incentives be structured for scorecard- based programs e.g. to achieve the same level of incentive as RA programs?

Concentric did not address this issue in its Report. However, if the Board determines that it wishes to use the scorecard approach for certain programs such as Low Income Programs, then our research in other jurisdictions suggests that the California model could merit consideration. California considers a minimum level for each category and a simple average of all categories. A utility must reach a minimum level for each category to receive any financial incentives.

Issue #2: Avoided Costs

Question 47 – (EP Question 1)

Pp. 51-55 and passim: In your estimates of the values of greenhouse gas emissions in dollars per ton – those used in other jurisdictions and those recommended for Ontario – please clarify whether the values are stated in dollars per ton of carbon dioxide emitted, or per ton of carbon emitted as carbon dioxide.

We have not checked with each jurisdiction, but we believe these are expressed in dollars per ton of carbon emitted (or equivalent), which is the more common measure.

Question 48 – (EP Question 2)

Is Concentric aware of any jurisdictions that consider the climate-forcing impact of avoided (or increased) fugitive emissions of methane as a result of DSM programs? Do the authors recommend such consideration for Ontario?

In the course of our research, Concentric did not focus its attention on this issue. GHG emissions were considered in our research to the extent that other jurisdictions have attempted to account for environmental and societal externalities in applying the cost effectiveness tests. Concentric has recommended that the Board may wish to consider quantifying the value of carbon emissions for purposes of determining whether a DSM program is cost effective. As data on additional impacts become available (such as fugitive emissions), it would be appropriate to consider inclusion in the SCT determination.

Question 49 – (GEC Question 3)

Concentric's discussion of avoided costs did not mention what is sometimes referred to as Demand Reduction Induced Price Effects (DRIPE), or the impact that substantial levels of gas savings could potentially have on market clearing prices for commodity. Why not? Is this simply a conservatism?

As indicated on page 53 of the Report, Concentric has endorsed the Board's current approach for updating gas commodity costs. Our understanding is that gas commodity costs are assessed using standard forecasts, relating prices to the NYMEX price at Henry Hub and other points, and applying seasonal adjustments and load shape factors. This is consistent with the practice in other jurisdictions that were included in our research sample. To the extent that reductions in gas consumption reduce the market clearing price for the commodity, Concentric expects that change would ultimately be reflected in current and projected market gas prices, and therefore captured in the Board's current approach.

Question 50 – (SEC Question 13)

The Report discusses, at pages 53 – 55, the possibilities of reducing the discount rate, or using the avoided costs of renewable electricity options. It also refers to “extending the effective useful life of certain DSM measures...”, but does not explain that suggestion. Please expand on what is meant in that sentence on page 53.

The concept of “extending the effective useful life of certain DSM measures” refers to the determination of whether the benefits from installing an energy efficiency measure are expected to continue beyond the standard useful life of that measure. For example, energy efficient windows are frequently cited as a measure that provides longer-term benefits than what is allowed in standard useful life calculations.

Issue #3 – Input Assumptions and Parameters

Question 51 – (EGDI Question 8)

What process does Concentric propose for approving assumptions for new measures during the multi-year plan period?

Concentric's Report did not specifically address this issue other than to note on page 61 that it will be necessary for the Board to continuously develop new input assumptions for new energy efficiency technologies. The Board may determine that it is necessary to retain an independent consultant to assist in developing a common set of input assumptions for these new measures, or the Board may determine that it is possible to establish input assumptions based on its knowledge and experience with similar DSM technologies and the input of the distributors. In either event, Concentric anticipate that interested stakeholders would be allowed to provide evidence and participate in the process.

Question 52 – (EGDI Question 9)

In respect of approved measure assumptions, please clarify if approved measure assumptions would be “locked in” at the beginning of the program year for the entirety of a program year for the purposes of calculating program results and incentives.

As indicated on page 61 of the Report, Concentric recommends that the Board continue to update input assumptions to reflect the best available information based on the Evaluation Reports. Page 119 of the Report notes that the Board-approved input assumptions are updated annually based on the Evaluation Report. The following sentence states: “When input assumptions are updated, Concentric believes that it is appropriate to use best available information for purposes of calculating the financial incentive payment.” Concentric clarifies that our intention was that DSM input assumptions will be updated for the current and subsequent program years as a result of the annual Evaluation Reports for purposes of SSM. They would not, however, be adjusted retrospectively for the prior program year that the Evaluation Report covered. Should the Board determine that LRAM (vs. decoupling) should be retained, then the Evaluation Report would apply to the program year covered by the Evaluation Report. The reason for this distinction is that we understand LRAM to be a true-up mechanism for lost revenues due to the implemented DSM measures, and therefore a retrospective approach is appropriate. The SSM mechanism is designed to incent the utility for deploying DSM measures that meet targets set in advance with the full input of the utility, stakeholders, the Board, and its independent consultant. There is ample opportunity to vet these assumptions in advance, with the benefit of providing greater certainty for program planning and implementation. Further, with the adoption of BAT as a primary metric for setting targets, this should alleviate some of the concerns regarding measurement of TRC savings. Lastly, we would expect that the evaluation reports will be used to adjust input assumptions on a going forward basis, so any gaps should narrow over time. We understand that input assumptions are primarily technology related, while adjustment factors are more attributable to program design and consumer behavior (and therefore more subject to change). To the extent that the Board sees a persistent gap between projected program results and those verified through the Evaluation Reports, it may wish to reconsider the trade-off between the planning certainty that our recommendation embraces, and the ability to verify benefits commensurate with the incentives awarded.

In short, we recommend a continuation of the approach taken in the 2006 DSM Framework with regards to certainty of assumptions for LRAM and SSM calculations (EB-2006-0021, Decision with Reasons, August 25, 2006, pp 10-11, Issue 3.3).

Question 53 – (EGDI Question 10)

Please clarify if avoided costs would be “locked in” at the beginning of the program year for the entirety of a program year for the purposes of calculating program results and incentives.

As indicated on page 53 of the Report, Concentric endorses the Board’s current. Also, please see response to EGDI Question 9 (Question 52) above.

Question 54 – (EGDI Question 11)

Please confirm that Concentric is recommending that every program will need to have input assumptions (energy savings, incremental costs, free ridership, etc.) measured and established for the purposes of SCT and PAC screening, in addition to market penetration data for those programs that will be evaluated on that basis.

Concentric confirms EGDI’s understanding of this recommendation.

Question 55 – (SEC Question 14)

Please confirm that Concentric’s proposal on page 61 to allow gas distributors to propose different input assumptions would be symmetrical, i.e. either distributors or intervenors could propose different input assumptions to the Board and provide evidence in support.

Concentric confirms that this proposal is intended to be symmetrical.

Question 56 – (Union Question 5)

Please clarify which of the approaches below Concentric recommends for the use of best available input assumptions, including avoided costs, and outline the rationale for the approach recommended.

- a. would be based on best available data approved for SCT, PAC, the target(s) and performance measurement prior to the program year and would not be changed retroactively within that year. Any changes based on Evaluation Reports and new information would be applied to the next full program year within the term of the DSM framework;
- b. Input assumptions would be based on best available data for SCT, PAC, the target(s) and performance measurement at the end of the program year and would all be changed retroactively at the end of that year;
- c. Outline approach if not captured by a) or b).

Please see response to VECC Question 2.D (Question 45) and EGDI Question 9 (Question 52), and EGDI Question 10 (Question 53).

Question 57 – (Union Question 6)

Recognizing that changes to input assumptions, including avoided costs, may be significant, what mechanism is Concentric suggesting to adjust the recommended 3-5 year targets when these changes alter the prioritization of DSM programs?

When input assumptions change sufficiently between program cycles, we would expect the distributor to make the Board aware of this issue with the annual DSM program report which discusses program variances, and recommend appropriate shifting of dollars to programs with the higher benefits.

Issue #4: Adjustment Factors

Question 58 – (CCC Question 9)

p.64 - Would Concentric agree that determining free-ridership rates and attribution becomes more difficult to measure in an environment where there are increasingly more and more providers of DSM and CDM programs?

Yes, we would agree, placing somewhat more emphasis on the Program Evaluation reports, and methodology for collecting this information.

Question 59 – (CCC Question 10)

p. 69 - How does Concentric propose that persistence is determined?

As a practical matter, customer surveys will be required to reliably measure persistence. As noted on page 69, we recommend that persistence be determined initially at the start of each three year DSM program cycle from the technical input assumptions, and then checked against the annual program evaluation reports.

Question 60 – (EGDI Question 12)

If a gas utility is the entity with primary responsibility to operate a program and generate results, shouldn't the default rule be that its attribution is 100% unless there are demonstrable good reasons to use a different percentage?

As indicated on page 69 of the Report, Concentric is concerned that the centrality principle currently used by the OEB gives too much credit to gas distributors for DSM programs. Concentric recommends that, rather than attributing 100% of the benefits to gas distributors that satisfy the centrality principle, as the default, the utilities should provide evidence supporting any percentage greater than that actually spent by the utility. Otherwise, the OEB should assign a percentage of credit to the utility based on the percentage of total dollars they spent on designing, developing and delivering the joint DSM programs in question. We believe this would more equitably attribute benefits to gas distributors than under the existing DSM framework.

Question 61 – (EGDI Question 13)

With regard to attribution, why did Concentric not recommend the approach used in California? Would the California approach tend to encourage more partnering between gas utilities and other DSM players?

In California, the PUC does not make adjustments to the gross energy savings, opting instead to evaluate the total amount of energy saved regardless of originator. Under this approach, even savings that would have been realized absent utility efforts are considered in applying credit for conservation. As stated in our report, Concentric is concerned that the attribution approach currently used by the OEB (the centrality principle) awards too much credit to gas distributors for DSM programs.

Question 62 – (EGDI Question 14)

Does Concentric agree that, where the gas utility is retained by an electric utility under contract, the attribution should be as set out in the contract with the electric utility?

Under the circumstances posed in the question, this would be a positive if the utilities can agree in advance. Concentric believes the contract between the gas distributor and the electric utility should be submitted to the Commission as evidence supporting a percentage greater than that actually spent by the gas distributor. The Board would then consider this contract in determining attribution.

Question 63 – (EGDI Question 15)

Please describe the rationale or contributing factors that led Concentric to the position that program attribution should be determined primarily by the program partners' contributions to the program budget.

Concentric recognizes that determining attribution for joint DSM programs is a difficult question. Concentric's recommendation is based on the premise that the percentage of total dollars spent on designing, developing and delivering joint DSM programs is the most readily observed factor. While there may be other factors that should be considered in determining attribution, Concentric's opinion is that percentage of financial contribution is an equitable default. However, as indicated on page 69 of the Report, our recommendation allows gas distributors the opportunity to provide evidence supporting a different percentage.

Question 64 – (EGDI Question 16)

Does Concentric agree that the attribution rule it proposes, if adopted, that is adopted will cause the gas utilities to gravitate towards programs where it is easier to prove attribution? Will this not act as a disincentive to gas utilities partnering with other third parties? Does Concentric understand that in a number of programs, the gas utilities have been the catalyst securing third party funding for programs? In such situations, shouldn't the gas utility be entitled to an attribution level greater than its financial contribution to the program?

Concentric assumes this question pertains to the attribution recommendation on page 69 of the report. Concentric does not necessarily agree that utilities would gravitate toward programs where attribution is easier to prove. First, utility programs would be prioritized according to the SCT and PAC test results for each program. For some programs (e.g., new efficient furnace installations), attribution is more readily measurable and proven. For other programs (e.g., mass media programs promoting efficient appliance purchases), the utility share of total funding for this program would be the appropriate starting point, unless the utility can demonstrate a disproportionate benefit to its actions or spending in relation to others. In the case cited, for example, where the utility has been the catalyst for third party funding, this would be an appropriate circumstance to recommend a higher level of attribution.

Question 65 – (EP Question 4)

Passim, esp. Pp. 68-69: A number of Concentric’s recommendations appear to change the incentive structure for LDC DSM programs in fundamental ways, which may create unintended consequences. Please explain how Ontario would assume that free ridership is offset by spillover, without creating an unintended incentive for an LDC to “chase” Free Riders.

As indicated on page 68 of the Report, the primary consideration in determining adjustment factors is balancing the desire for accuracy and precision with the cost, time and ability to measure and evaluate these factors. Concentric’s recommendation that free ridership would offset spillover is consistent with the approach taken in other jurisdictions, including California and Minnesota. We believe that by moving to market penetration as the primary metric for measuring success that the issue of free ridership will become less important in Ontario. However, we have also endorsed the idea of using empirical data from the annual Evaluation Reports to develop more accurate information concerning free ridership rates for individual DSM measures.

Question 66 - (EP Question 5)

P. 69: Similarly, please explain how Concentric would apportion incentive payments based on DSM dollars spent (e.g., when attributing benefits of joint programs), without creating an unintended incentive for an LDC to maximize DSM spending rather than leverage or cost-effectiveness.

Concentric acknowledges that our proposal regarding attribution could provide gas distributors an incentive to maximize DSM spending. However, we believe that this concern is mitigated by the fact that DSM programs will not receive top priority under the SCT or Program Administrator Cost test if the benefit/cost ratio of the program is not among the most favorable of those proposed for approval by the Board.

Question 67 - (EP Question 6)

Ibid.: Can Concentric see a constructive role for LDC activity in inexpensively magnifying the participation rate, or cost-effectiveness, of DSM programs funded by others – e.g., helping to ensure that all eligible LDC customers participate in government-funded DSM programs. If so, does Concentric have a preferred mechanism for attaching a financial incentive to such an activity?

Yes. This role would be consistent with partnering with electric utilities or other DSM providers where the utility’s resources can leverage those of their program partners. The financial incentive should be based on the attribution principle outlined on page 69 of the Report.

Question 68 – (SEC Question 15)

The Report discusses free riders, spillover, and attribution, all aspects of causation. In Concentric’s view should the Board retain the principle that gas distributors should only be incented in respect of savings that they caused through their programs?

Yes, Concentric believes that the Board should retain the principle that gas distributors should only receive shareholder incentive payments for achieving established program targets (i.e., market penetration, reductions in gas consumption, or reductions in carbon emissions) that are caused either directly or indirectly (in the case of spillover) by their DSM programs.

In Concentric's view, where there is an unintended impact of a program (e.g. spillover), should it in principle be included in the calculation of the savings?

Yes, Concentric's view is that according to that principle the unintended impact of a program (e.g., spillover) should be included in the calculation of savings by the same principle that free ridership would not be included. However, as discussed on page 68 of the Report, the challenge with adjustment factors, especially free ridership and spillover, is accurate measurement.

Question 69 – (SEC Question 16)

Please comment on the use by New York and Washington of a fixed .90 ratio of gross to net to deal with both free riders and spillover. What steps, if any, has New York or Washington taken to prevent distributors from gaming this system by choosing programs that are easy to roll out because of the high numbers of free riders?

This question would require additional research.

Question 70 – (SEC Question 17)

As with question 14 above, please confirm that Concentric's proposal on page 69 to allow gas distributors to propose higher attribution percentages is intended to be symmetrical, i.e. either distributors or intervenors could propose an attribution percentage different than the default rule, and provide evidence in support.

Concentric agrees.

Question 71 – (Union Question 7)

As Concentric is recommending attribution based on dollars spent by the utility, what factors led Concentric to the conclusion that budget is the primary indicator of a partner's contribution to the program?

See response to Question EGDI Question 15 (Question 63).

Question 72 – (Union Question 8)

Currently gas distributors undertake persistence studies for identified measures which may be uninstalled prior to the end of their useful life. What value does Concentric foresee in separating persistence from measure life for measures which are too costly or impractical to uninstall prior to their end of useful life?

As a practical matter, even though in this instance the facility remains “installed”, it is not being utilized, so Concentric would suggest accounting for this measure as effectively uninstalled at this point, even though it’s useful life may be longer.

Question 73 – (Union Question 9)

How does Concentric recommend measure life and persistence be defined for behavioural programs?

This would be an issue for the Board’s independent consultant on input assumptions.

Issue #5: DSM Program Design

Question 74 – (CCC Question 11)

p. 75 - How is the UK's Community Energy Savings Programme funded?

According to the U.K. Department of Energy and Climate Change:

CESP targets households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. There are 4,500 areas eligible for CESP. CESP is funded by an obligation on energy suppliers and electricity generators.

Question 75 – (CCC Question 12)

p. 77 – How are the low-income programs referred to in the paper funded? Are the costs allocated only to the residential class or all rate classes?

As noted on page 93 of the Report, low-income programs in California are funded, in part, through proceeds from the Public Purpose Program surcharge. For San Diego Gas and Electric this low income surcharge ranges from \$0.036 to \$0.083 per therm, depending on customer class. Concentric does not have any additional information regarding funding for low-income programs. As such, this question would require additional research beyond what information has been provided in the report.

Question 76 – (EGDI Question 17)

How should utilities be encouraged to engage in long term development activities that address deep market barriers, e.g., capacity building or research and development?

Please see response to CCC Question 7 (Question 21). Concentric believes that pilot programs are an effective way for the Board to encourage utilities to engage in long-term development activities that address deep market barriers. Further, Concentric endorses Minnesota's approach of targeting a small percentage of the DSM budget for special funding of research and development efforts. In our view, both pilot programs and special funding for R&D efforts provide the Board with ways to encourage gas distributors to pursue innovative DSM programs that address deep market barriers.

Question 77 – (GEC Question 1.I)

Please confirm that we have correctly understood Concentric's views on the following points.

Programs targeted to mass markets (e.g. residential and small commercial customers) benefit from clear and consistent messages to a variety of key market players (e.g. consumer, retailers, contractors, manufacturers, etc.). Thus, the Board should expect the two gas utilities to offer consistent, integrated programs in those markets unless compelling reasons for doing things differently in each service territory are offered.

Concentric's Report has not specifically addressed whether the Board should expect gas distributors to offer consistent, integrated programs to mass markets. However, in our opinion, that approach sounds reasonable, unless as noted, there are compelling reasons not to do so.

Question 78 – (SEC Question 18)

Should market transformation programs include customer or channel rebates or incentives? In Ontario, the most successful “market transformation” program was actually a resource acquisition program for high efficiency water heaters, that eventually transformed the market. Does Concentric believe that programs that combine some aspects of resource acquisition and some aspects of market transformation should be permitted? If so, how should they be handled within the proposed framework, in terms of budget, targets, and incentives? How would the introduction of combined programs integrate with Concentric's proposal to use market penetration as the primary measure of program success?

Concentric believes that programs that combine aspects of resource acquisition and market transformation should be both encouraged and permitted. We suggest that these programs should be evaluated in the same way as conventional DSM programs. Targets should be set by the Board in conjunction with the utility and the EAC, with realistic expectations for what these programs can accomplish. The utilities should have an opportunity to earn shareholder rewards if they exceed these targets.

How would the introduction of combined programs integrate with Concentric's proposal to use market penetration as the primary measure of program success?

Concentric does not anticipate that integration would be a concern for programs that combine elements of resource acquisition and market transformation. We believe that achieving a high level of market penetration of the targeted technology should be the goal for combined market transformation and resource acquisition programs, just as it is for conventional DSM programs. Incentives should be calibrated to match the utility's role and performance in achieving established targets.

Question 79 – (SEC Question 19)

How would program design change, in Concentric's view, with the move from TRC to SCT, and in particular the addition of externalities?

Concentric does not believe that program design will materially change with a transition from the TRC test to the Societal Cost Test. Inclusion of carbon pricing should amplify the value of gas commodity savings. As indicated on page 47 of the Report, Concentric does believe the number of DSM programs that would be determined to be cost effective would increase as a result of moving to the Societal Cost Test.

Question 80 – (SEC Question 20)

Can Concentric summarize how the VeSM program described on page 80 differs from the activities by Union and Enbridge today in working with their manufacturing customers?

No, Concentric has not studied how Union and Enbridge are working with their manufacturing customers today.

Question 81 – (SEC Question 21)

The Report discusses, at page 80, the use by municipalities of low rate financing to incent DSM measures. Does Concentric have any knowledge of utilities that have used this technique (as opposed to governments)?

Concentric is not aware of any utilities that have used this specific technique. However, some utilities offer financing for DSM measures and allow customers to pay for that financing through their monthly bills. In our opinion, this is probably a more appropriate financing technique for residential and commercial customers of an investor-owned utility. Direct financing assistance for industrial customer energy initiatives could be considered.

Question 82 – (VECC Question 2.F)

Page 75 Low Income Customer Programs

“Among the five Canadian provinces reviewed in our research sample, only Quebec explicitly requires natural gas distributors to implement DSM programs to address low-income customers. Of the 12 U.S. states surveyed, nearly all require programs that address low-income customers, with the rigor of each program varying from state to state. Among the programs outside North America that were evaluated, the only program with a specific framework for action by utilities is Great Britain’s Consumer Energy Savings Programme (“CESP”), which requires utilities to meet performance goals by addressing the challenges of low-income customers.”

Manitoba has 3 year Low Income Energy Efficiency Program (gas and electric) funded out of AEF Did CEA examine that program?

No, Concentric did not examine the low income energy efficiency program in Manitoba.

Question 83 – (VECC Question 6.A)

What is/should be the definition of MT?

As indicated on page 71 of the Report, market transformation programs are defined as those that (a) seek to make a permanent change in the market for a particular measure, (b) are not necessarily measured by the number of participants, and (c) have a long time horizon. As noted on page 74 of the Report, market transformation programs are intended to alter gas consumption patterns through customer education or long-term behavioral changes.

While conventional DSM programs have focused on direct assistance to customers for purchasing and installing efficient appliances and other efficient practices, market transformation programs aim to provide a more efficient product mix to the market. These market transformation programs may be oriented toward consumer demand, or toward innovative supply offerings from manufacturers, building construction professionals, etc.

Question 84 – (VECC Question 6.B)

Page 83

“Concentric recommends that the Board utilize a combination of customer and vendor surveys to estimate the effectiveness of these (MT) programs, with the understanding that precise estimates of savings from market transformation programs are not attainable.”

How should success of MT programs be measured? E.g. scorecards

Please see responses to EGDI Question 25 (Question 117) and Union Question 23 (Question 136).

Question 85 – (VECC Question 6.C)

How should SSM be tied to MT Achievement?

Concentric believes it is appropriate for the Board to provide incentives for market transformation. We have addressed the measurement of market transformation programs in responses to Questions 78, 117, 133 and 136.

Question 86 – (VECC Question 7.A)

Does CEA agree that both Union and EGD should offer a standard set of mass market Residential Programs (like OPA) unless compelling reasons for doing things differently in each service territory are offered.

See response to Question GEC 1.I (Question 77).

Question 87 – (VECC Question 7.B)

Does CEA agree that Union and EGD should also offer a base set of Low Income Measures/programs across their service territories unless compelling reasons for doing things differently in each service territory are offered.

See response to Question GEC 1.I (Question 77).

Issue #6: DSM Budgets

Question 88 – (BOMA/LMPA Question 3)

Please explain why Concentric is recommending a Board-recommended range of 4.0 to 6.0% of utility revenues less the purchased cost of gas when only 3 of the 10 U.S. distributors shown in Table 15 are within this range.

As noted on page 89 of the Report, the average Canadian gas distributor spent approximately 2.0% of distribution revenues on DSM programs in 2007, while the ten U.S. gas distributors in Table 15 spent approximately 3.9% of distribution revenues on DSM programs in either 2007 or 2008. The recommended range of 4.0% to 6.0% is an attempt to balance the need to increase spending on gas DSM programs in order to achieve policy objectives while being cognizant of the rate impact on customers. The important component of this recommendation is not the precise range that the Board should establish, but the concept that DSM budgets should be based on a percentage of utility distribution revenues until SCT ratios fall below 1.0. As indicated on page 95, the recommended range may be determined after consideration of relevant parameters such as: 1) achieving a long-term Societal Cost Test equal to 1.0; 2) achieving market penetration of 90% of the Best Available Technologies for mass market DSM measures; and 3) contributing toward achieving any carbon reduction targets that are established as a result of the Green Energy Act or similar future legislation.

Question 89 – (CCC Question 8)

p. 48 -If the Board is adopting a public policy objective of encouraging energy efficiency programs for low-income consumers, how should those programs be funded? Why would it be fair to fund them entirely from residential rates?

This question requires a policy decision by the Board, and is beyond the scope of Concentric's report.

Question 90 – (CCC Question 13)

p. 95 - Concentric is recommending that Union and Enbridge have an annual DSM budget of between 4-6% of distribution revenue. What information does Concentric have that would indicate that Enbridge and Union have the capacity to undertake that level of cost-effective DSM spending?

Concentric's recommendation is not based on Enbridge and Union's capacity to undertake any specific level of cost-effective DSM spending. As discussed throughout the Report, Concentric is recommending that the Societal Cost Test be used to evaluate the cost-effectiveness of each DSM program. To the extent that more programs are determined to be cost effective than can be funded, Concentric recommends using the Program Administrator Cost test to prioritize which programs are approved and funded. Finally, Concentric recommends a range for the annual DSM budget of 4-6% of distribution revenues, and a minimum threshold of 3%. To the extent that Enbridge or Union do not have sufficient financial or operational capacity to deliver programs of this magnitude, we would expect the distributor to explain the limitation to the Board and seek a resolution within the Company's capacity.

Question 91 – (CCC Question 14)

p. 96 - Concentric recommends that the gas distributors, in consultation with interested stakeholders should submit their budget requests to the Board for approval? What process is envisioned? How often should this consultation occur? What if consensus cannot be reached?

Concentric's Report did not focus on administrative process. Concentric anticipates that the utility would submit its DSM application and its budget request to the Board for approval. Concentric has not offered any recommendations regarding the frequency of the consultation with interested stakeholders, nor have we offered any recommendations concerning the process if consensus cannot be reached. In our opinion, those are decisions for the Board and the OEB staff.

Question 92 – (EGDI Question 18)

As stated, a DSM budget at 3-6% of utility revenue would not be sufficient to meet provincial goals of 80% reduction in GHG emissions. What amount does Concentric suggest would be required for the utilities to assist the province in meeting the provincial emission reduction goal?

This question would require significant additional research and analysis, and is beyond the scope of this Report.

Question 93 – (EGDI Question 19)

How does Concentric define “an appropriate degree of flexibility” for the utilities? Does this mean that where a gas utility proposes a DSM budget that falls in the range of 3 to 6 percent of utility revenues, a presumption arises in favour of the proposed budget amount for the purposes of obtaining approval from the Board in respect of a DSM plan?

On page 96 of the Report, Concentric recommends that the Board allow gas distributors some flexibility in proposing budgets to meet DSM metrics and targets. As explained in the following sentences, the basis for this recommendation is that Concentric believes gas distributors are in the best position to determine which DSM programs and measures will meet the specific DSM metrics and targets that have been established by the Board because the utilities have the most interaction with customers and they understand how customers respond to various programs. Concentric's recommendation is not intended to suggest that if a DSM budget proposal falls in the range of 3-6% of distribution revenues, a presumption rises in favor of the proposed budget amount. The Report clearly indicates that these percentages represent a Board-recommended range, subject to the determination that the proposed DSM measures and programs are cost-effective and in the public interest.

Question 94 – (EGDI Question 20)

How does Concentric define Research and Development (“R&D”)? What proportion of the DSM budget does Concentric recommend be devoted to R&D?

Concentric would broadly define R&D as efforts directed at developing, adapting or commercializing new technologies that have not yet reached broad commercial status in the marketplace for conservation or demand management technologies. Concentric has not

recommended what, if any, budget should be directed at R&D, other to note that we felt the Board had some discretion in approving such programs where the benefits could be justified. On page 48 of the Report we note:

“Finally, Concentric recommends that the Board apply the cost effectiveness test on a program basis rather than a portfolio basis. We believe that each individual DSM program or measure should be evaluated on its own merits, and that the Board should favor those programs and measures which are most cost effective. A portfolio approach is not recommended because we believe that it tends to blur the distinction between more effective programs and less effective programs, and it limits the flexibility of the Board to approve specific DSM programs as new technologies emerge and as policy objectives change. Although the utilities have expressed concern that applying the cost effectiveness test on a program basis discourages them from pursuing more innovative technologies, Concentric believes that concern can be addressed through approval of special funding for research and development efforts (similar to what is done in Minnesota) and for pilot programs that may not have benefit/cost ratios greater than 1.0, as long as the Board has an opportunity to review the success of those programs within two or three years.”

Question 95 – (EGDI Question 21)

As Concentric notes in its report, DSM budgets are on an upward trend. Does Concentric suggest a one-time large increase in DSM budgets, or should the budgets be escalated more gradually over a number of years?

This question requires a Board policy decision, but as a practical matter, we would imagine a gradual escalation over a few years, with consideration of the benefits of programs to be funded.

Question 96 – (GEC Question 1.B)

Please confirm that we have correctly understood Concentric’s views on the following points:

The data presented for DSM impacts and budget levels in other jurisdictions (e.g. tables 14, 15 and 23) are several years old and given the trend in these values are likely to understate key values, such as spending as a percent of utility revenues, expected in those other jurisdictions for the 2012 period.

Concentric has not reviewed more recent DSM spending levels (with the exception of those approved by Enbridge and Union). As a general premise, we would agree that DSM budget levels have been increasing, but this question would require additional research.

Question 97 – (GEC Question 1.C)

Please confirm that we have correctly understood Concentric’s views on the following points:

Concentric’s numerical recommendations on budget level are simply a reflection of the practices elsewhere (in the 2007-2008 timeframe). The underlying policy position that Concentric recommends is that DSM portfolios and budgets should be set to achieve the policy objectives in place.

Concentric agrees with this statement. We would add that our recommendation is based on the concept that the DSM budget should be established as a percentage of distribution revenues as a means of governing the speed and near-term ratepayer impacts of achieving the Province's policy objectives. As those policy objectives or their timing change, the rate of spending should be altered accordingly.

Question 98 – (GEC Question 1.D)

Please confirm that we have correctly understood Concentric's views on the following points:

Concentric believes that it is desirable from an economic perspective to pursue all socially cost-effective efficiency tempered by a concern that rate impacts not be undue in any given period.

This is consistent with our recommendation on page 46 of the Report.

Question 99 – (GEC Question 1.E)

Please confirm that we have correctly understood Concentric's views on the following points:

Concentric believes it is possible to mitigate concerns about rate impacts from DSM programs through various means, including offering a broad enough portfolio of programs to allow all consumers to participate in at least some way.

Concentric believes that the rate impact of DSM programs will always be a concern. However, we believe the costs should be weighed against the benefits, which include customer bill savings, avoided costs for the utility, reductions in gas consumption attributable to energy efficiency, and societal benefits such as reduced GHG emissions.

Question 100 – (GEC Question 1.F)

Please confirm that we have correctly understood Concentric's views on the following points:

The three parameters Concentric presents for establishing budget goals on p. 95 of its report (achieving positive SCT, achieving 90% market penetration for best available technology and contributing in a significant way to meeting provincial greenhouse gas reduction goals) cannot all be met at budget levels of 4% to 6% per year.

This question would require additional research and analysis beyond the scope of our Report.

Question 101 – (SEC Question 22)

Can Concentric comment on the reasons why it is appropriate for program budgets for DSM be recovered from ratepayers separately from recovery of incentives? To what extent have other jurisdictions considered combining the budget and incentives, so that the incentive is sufficiently large that the distributor will put its own money at risk to achieve program targets? What are the pros and cons of considering such an approach?

Concentric has not made specific recommendations in terms of recovering DSM expenditures and incentives, nor have we examined whether other jurisdictions have considered combining the budgets and incentives. However, from Concentric's perspective, utilities always place shareholder capital at risk to achieve DSM program targets with the expectation of cost recovery.

Question 102 – (SEC Question 23)

On page 19 you note that currently gas utility DSM budgets are 3% of distribution revenues. Can you please provide the source of that figure, and reconcile that figure with data later in the report suggesting something closer to 2% of distribution revenues?

Page 89 of the Report contains a chart demonstrating that Canadian gas utilities spent an average of approximately 2% of distribution revenues on DSM in 2007, while a sample of U.S. gas distributors spent approximately 3.9% of distribution revenues in either 2007 or 2008.

Please refer to Table 13 on page 86 for current spending levels for Union and Enbridge.

Question 103 – (SEC Question 24)

On page 91 there is a discussion of budget-setting in Mass., designed to achieve 2% gas use savings per year. Can Concentric comment on the suitability of allowing gas distributors to keep any GHG credits earned from their DSM efforts (which at 2% would be about \$20 million total per year in Ontario) in lieu of some percentage of the budget they currently recover from ratepayers? What would be the implications of such a change?

This question would require additional research beyond the scope of our Report.

Question 104 – (SEC Question 25)

Does Concentric's proposed EMV budget of 3% to 5% of total DSM budget include costs of the Ontario Energy Board for its expanded involvement in these processes?

As noted on page 97 of the Report, Concentric's primary recommendation on this issue is that the Board should consider more extensive review of those programs that account for the majority of expenditures and savings, and that smaller programs be subject to less rigorous or less frequent scrutiny. Our alternative recommendation is for the Board to consider a cap on spending for evaluation, monitoring, and verification. Based on our research, Concentric recommended that an appropriate range would be 3% to 5% of the total DSM budget for each gas distributor. We did not include OEB costs in the 3-5% recommendation.

Question 105 – (Union Question 10)

Is Concentric recommending budgets be approved on an annual or multi-year basis?

Concentric has not made a recommendation concerning whether DSM budgets should be approved on an annual or multi-year basis, although we perceive benefits from a multi-year approach in terms of program planning and delivery.

Question 106 – (Union Question 11)

What relationship is Concentric recommending between adjustments to the recommended multi-year targets and the budget?

Concentric has not made recommendations specific to this process.

Question 107 – (Union Question 12)

Confirm that Concentric recommends an over spending structure which the utilities could utilize to maintain program momentum above the budget proposal comparable to the existing DSM Variance Account? If not, why not?

As indicated on page 96 of the Report, Concentric endorses the current DSM variance account (DSMVA) as an effective method for reconciling the difference between actual DSM spending and budgeted amounts. This allows utilities to spend up to 15% above budgeted amounts in a given year, and conversely, refunds to ratepayers any unspent amounts.

Question 108 – (Union Question 13)

Is Concentric's research that forms the basis for the proposed EM&V budget of 3% to 5% of the total DSM budget based on jurisdictions which operate under similar screening, measurement, and audit requirements as those proposed in the report?

See response to SEC Question 25 (Question 104). As noted in Table 18, the other jurisdictions in our research employ a wide variety of screening, measurement, and audit requirements. For example, California focuses on those DSM programs that make up 80% of total program savings and places a 4% cap on utility's EM&V budgets. Connecticut caps the EM&V budget at 1.4%, but not all programs are evaluated every year, and not all types of evaluations are performed on each program. Minnesota caps spending on EM&V at 10% of first year benefits, but allows utilities to keep costs low by assuming that free ridership is offset by spillover. The important element of this recommendation is not whether 3% to 5% is the appropriate range for spending on evaluation and monitoring activities, but that we believe the Board should establish some cap on EM&V spending so that the majority of dollars spent on DSM programs go toward program-related costs rather than evaluation and monitoring expenses.

Has an analysis been done on the budget implications for evaluation and audit in order to accommodate for the benchmarking and ongoing market penetration studies required to measure results under Concentric's recommendation?

Concentric has not analyzed the budget implications of our recommendation for benchmarking and market penetration studies, but we have recommended that some of these expenses be supported by program (vs. EM&V budgets). Please see response to Question 170.

Question 109 – (Union Question 14)

Does Concentric recommend the budget continue to be recovered exclusively from the rate class to which the funding was directed?

Concentric's Report did not offer a recommendation regarding how the DSM budget should be recovered. However, our research in other jurisdictions indicated that most allow the gas utility to recover the cost of DSM programs through some type of customer charge. These cost recovery mechanisms include customer surcharges, system benefit charges, and through base rates.

Question 110 – (VECC Question 3.A)

Reference Page 96

“Concentric believes that it is reasonable to establish separate DSM budgets for Resource Acquisition Programs, Market Transformation Programs, and Low-Income Customer Programs. However, we do not have sufficient information to evaluate the reasonableness of the percentages that should be allocated to each segment in Ontario.”

Has CEA an opinion on the current OEB approach of setting LI DSM budgets as a % of residential budgets based on LI demographics?

As indicated on page 96 of the Report, Concentric believes it is reasonable to establish separate DSM budgets for Resource Acquisition Programs, Market Transformation Programs, and Low-Income Customer Programs. Concentric is aware that the budget for low-income customers was established in 2007 at a minimum of \$1.3 million, or 14% of each respective utility's residential DSM program budget, whichever is greater. However, as noted on page 96 of the Report, Concentric does not have sufficient information to evaluate the reasonableness of the percentages that should be allocated to each segment in Ontario.

Question 111 – (VECC Question 3.B)

Does CEA have examples of how LI budgets are set in other jurisdictions? Please cite sources.

Please refer to page 92 of Concentric's report:

Maine and Massachusetts are among the states with the most aggressive quantitative requirements for low-income programming. In Maine, gas distribution companies must allocate 10% of conservation funding to programs targeting the needs of low-income customers.² Minnesota has also instituted a numeric threshold for low-income programs,

² Maine Public Utility Commission's Natural Gas Rules, Chapter 480.

requiring its gas utilities to commit a minimum of 0.2% of gross operating revenue. As mentioned above, in Massachusetts, the Energy Efficiency Advisory Council (“EEAC”) requires that funds for low-income programs are proportional to the funds that are provided by that sector.

For more information, please refer to:

- Maine Public Utility Commission’s Natural Gas Rules, Chapter 480
- Section 216B.241 of the Minnesota State Code
- Massachusetts EEAC Resolution Concerning Its Priorities to Guide the Development, Implementation, and Evaluation of the PA Efficiency Plans (Approved March 24, 2009)

Issue #7: DSM Metrics and Targets

Question 112 – (CCC Question 16)

pp. 107-108 -Concentric is recommending that the Board adopt the "Best Available Technologies" as the primary metric for evaluating whether a particular DSM program measure is successful. How are "best available" technologies determined? How would changes in building codes and appliance efficiency standards impact this model?

Concentric did not make any recommendations in the Report concerning how to determine the Best Available Technologies. However, Concentric suggests that the ENERGY STAR program in the U.S. and Canada might be a useful guidepost in establishing the parameters for how to determine the BAT.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy introduced in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program makes it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features and comfort. The ENERGY STAR label appears on over 60 product categories, including major appliances, office equipment, lighting and home electronics.

Products are eligible to carry the ENERGY STAR brand by meeting the energy efficiency requirements set forth in the ENERGY STAR product specifications. EPA establishes these specifications based on the following guidelines: (1) product categories must contribute significant energy savings nationwide; (2) qualified products must deliver the features and performance demanded by consumers, in addition to energy efficiency; (3) if the qualified product costs more than a conventional, less-efficient counterpart, purchasers will be able to recover their investments in increased energy efficiency through lower utility bills within a reasonable period of time; (4) energy efficiency can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer; (5) product energy consumption can be measured and verified with testing; and (6) labeling would effectively differentiate products and be visible for purchasers.

In Canada, according to the Office of Energy Efficiency:

- Natural Resources Canada's Office of Energy Efficiency promotes the international ENERGY STAR symbol in Canada and monitors its use. It also enrolls participants in the program (if they are not already enrolled in the United States).
- The fundamental feature of ENERGY STAR is that it is an endorsement symbol for the most energy-efficient products sold in the marketplace.
- In Canada, there is also the EnerGuide label, which provides energy performance ratings. ENERGY STAR goes one step further and identifies products that meet prescribed higher levels of energy efficiency.

The U.S. EPA has entered into agreements with the following foreign governments to promote specific ENERGY STAR qualified products. These partnerships are intended to unify voluntary energy-efficiency labeling programs in major global markets and make it easier for partners to participate by providing a single set of energy-efficiency qualifications, instead of a patchwork of varying country-specific requirements. Organizations that partner with our international Partners to

sell ENERGY STAR qualified products in other countries are held to the same requirements as the US program: Australia, **Canada**, European Union, European Free Trade Association, Japan, New Zealand, Switzerland, and Taiwan.

(See: http://www.energystar.gov/index.cfm?c=partners.intl_implementation).

If building codes and appliance efficiency codes change, we would expect these changes to be captured in revised Energy Star ratings.

Question 113 – (CCC Question 19)

p. 119 - How is Concentric proposing that market penetration levels are determined?

As indicated on page 109 of the Report, the market penetration metric would require gas distributors to establish a baseline of the existing circumstances in Ontario for each energy efficiency and conservation measure by conducting an inventory assessment. Once this work is completed, the OEB would be able to measure program success by establishing market penetration targets for each specific energy efficiency measure by a certain date. These percentages would depend on several factors, including the results of the inventory assessment that establishes the baseline for each measure, any specific metrics the Board may set regarding reductions in per capita gas consumption, and carbon reduction targets that may be promulgated as a result of the Green Energy Act.

Question 114 – (EGDI Question 22)

How will the use of market penetration of Best Available Technology simplify DSM administration when the necessary pre and post market penetration research will be in addition to work to support assumptions used in the SCT and PAC calculations? Isn't this in fact an added step that will be required in instances where the use of TRC or SCT tests have been effective to date?

As indicated on page 107 of the Report, one of the most difficult aspects of designing a cost effective energy efficiency and conservation program is determining how to measure success. From Concentric's perspective, this concern is best addressed by developing DSM metrics that are straight-forward and verifiable. Therefore, Concentric recommends that the Board adopt market penetration of the Best Available Technologies as its primary metric for evaluating whether a particular DSM program or measure is successful.

On page 108 of the Report, Concentric observes that using market penetration as the primary DSM metric has several important advantages. First, market penetration is a much more objective and measurable standard than energy savings. Second, it would mitigate the concern surrounding the financial incentive payment to gas distributors because there would be less concern among stakeholders that the utilities were being rewarded for achieving nebulous DSM results that could not be measured and independently verified. However, we recognize that market penetration does not resolve the ongoing controversy surrounding free ridership.

Question 115 – (EGDI Question 23)

Does Concentric agree that market penetration of Best Available Technology is a suitable metric for programs where:

- (a) The market penetration information is readily available without undertaking new primary research
- (b) There is a clearly identified technology that has wide application in the marketplace, e.g., high efficiency furnaces or high efficiency windows
- (c) The measure passes the SCT test
- (d) The measure is suitable for delivery through a prescriptive program.

As indicated on page 107 of the Report, Concentric recommends that the Board adopt market penetration of the Best Available Technologies as its primary metric for evaluating whether a particular DSM program or measure is successful. In situations where market penetration is not applicable or cannot be measured, Concentric recommends measuring the reduction in gas consumption attributable to the DSM program or measure. Concentric agrees with subparts (a), (b) and (d) above. Concentric believes that a DSM measure could pass the SCT test, as indicated in subpart (c), but the most suitable metric for that measure might be reduction in gas consumption rather than market penetration of BAT (e.g., attic insulation).

Question 116 – (EGDI Question 24)

Please confirm that it is Concentric's recommendation that, where it is not appropriate to use market penetration of Best Available Technology as the performance metric, the most appropriate metric is the gas savings achieved for individual customer participants in the program.

As indicated on page 107-108 of the Report, in situations where market penetration is not applicable or cannot be measured, Concentric recommends measuring the reduction in gas consumption attributable to the DSM program or measure.

Question 117 – (EGDI Question 25)

How does Concentric propose to measure performance for market transformation and research and development programs?

Market transformation programs are defined as those that (a) seek to make a permanent change in the market for a particular measure, (b) are not necessarily measured by the number of participants, and (c) have a long time horizon. Concentric recommends utilization of customer and vendor surveys to estimate the effectiveness of market transformation programs (see p. 83). Another alternative is to utilize overall trends in customer consumption. As suggested on page 74, "Market transformation programs are intended to alter gas consumption patterns through customer education or long-term behavioral changes. These programs include a wide variety of different approaches, which range from offering conferences and tradeshow for building contractors to radio advertising targeted to gas customers encouraging them to reduce energy consumption by X% per year over the next ten years by installing more energy efficiency space heating to education materials distributed to schools to teach children about saving energy and protecting the environment." The Board and distributors, therefore, may wish to set an overall consumption target, with market transformation used as a tool to achieve these targets.

We understand that Ontario's utilities can request funding for R&D or pilot programs designed to commercialize new DSM technologies. Concentric has not recommended performance metrics for

R&D programs. Research and development programs lend themselves to more task specific measurement (e.g., programs funded, results achieved, commercial applications produced, etc.).

Question 118 – (EGDI Question 26)

Since it is likely that the utilities will have to use forecast program TRC or SCT values for the purposes of allocating an appropriate portion of the SSM to the program, why not simply continue to use TRC results (or SCTs) as the performance metric for resource acquisition programs?

While Concentric recommends forecast Societal Cost Test results for determining which programs should be funded, the use of market penetration rates for resource acquisition programs should provide a more accurate and verifiable measure for determining actual program results.

Question 119 – (EP Question 3)

PPT Slides of April 29, esp. slide 31: In the discussion of April 29, we understood Jim Coyne to express general support for per-customer reduction in gas consumption (without attribution to DSM programs) as a metric for DSM performance and incentive payments – with the stated caveat that it might make more sense after the establishment of a specific government goal for reductions in carbon emissions or consumption. Please confirm or amend this understanding.

Yes. My Coyne expressed that opinion at the Stakeholder Meeting, recognizing that attribution would not be as important as actually calculating per customer and aggregate reductions in energy use and GHG emissions.

Question 120 – (EP Question 7)

“Evidence Regarding Reduction in Gas Usage”, Pp. 106, including Table 23: Please provide the time scale of the < 1% savings estimates provided. Were these savings produced over the course of one year? Are all the data for the same year, and if so, which year?

The information presented in Table 23 represents the reported reduction in gas consumption attributable to DSM programs compared to total gas consumption for six distributors that operate within the states covered by Concentric’s research survey. The data were gathered from reports filed by the gas distributors with the various state regulatory agencies for the 2008 DSM program year. The reported reductions in gas consumption represent savings that were attributable to DSM programs for the 2008 program year. Concentric interprets this to mean that the reported savings are those attributable to all approved DSM programs that were currently in effect during 2008. These are reported as annual savings rather than cumulative savings.

Question 121 - (EP Question 8)

Ibid and p. 26 first bullet point, “The average American home uses one-third less natural gas than it did a quarter century ago.”: According to our math, that 25-year national average reduction in domestic gas consumption has averaged a bit over 1.6% per year. Has Concentric discovered any data indicating whether the reduction has been increasing or decreasing in the years since DSM programs were implemented, or in jurisdictions in which DSM programs have been implemented?

According to the AGA study referenced in the question, gas consumption has declined by approximately 33% in the average American home over the past 25 years. This reduction represents an annual decrease of approximately 1.32% (i.e., 33%/25 years = 1.32% per year). During the course of our research, Concentric did not find any data indicating whether the percentage reduction has been increasing or decreasing in the years since DSM programs were implemented, or in jurisdictions in which DSM programs have been implemented. At a qualitative level, Concentric's view is that energy efficiency and conservation programs are one important factor that has contributed to reduced gas consumption among residential customers. However, Concentric does not have any information other than what is presented in Table 23, which would allow us to quantify the impact of DSM programs for gas distributors. Another complication in responding to this question is that DSM programs have been implemented at different times in different jurisdictions, making it difficult to draw any meaningful correlations between the implementation of DSM programs and the average reduction in residential gas consumption over the past 25 years.

Question 122 – (GEC Question 2)

With respect to the recommendation to focus utility DSM goals more on changes in market penetration rates of efficient technologies, would Concentric agree that this approach may necessitate moving to longer-term goals (both because progress in moving markets is often difficult to accomplish in one year time horizons and because the smaller changes that occur over just one year are not always possible to measure with sufficient accuracy to support payment of shareholder incentives).

Concentric would agree that longer term goals, in general, for DSM programs are sensible for the reasons GEC has cited. As stated on page 108 of the report: "Concentric recommends that the Board consider establishing long-term market penetration targets that cover three to five years, and require the gas distributors to propose how to achieve these targets in their DSM plan filings." While we did not explicitly address the implications for incentive payments, the Board could elect a partial payout based on annual evaluation reports, which is reconciled at the end of the three to five year period.

Question 123 – (SEC Question 26)

Please comment on the top-down gas use reduction targets described on page 104 in light of the conclusion by Pacific Economics Group that there is insufficient data in Ontario to develop top-down measurement of the impact of utility conservation programs. Please comment on the data on pages 106 and 107 on gas consumption reductions due to DSM programs, in light of that Report.

Concentric shares Pacific Economic Group's concern with the ability to measure savings using top-down methods. For that reason, Concentric has expressed a preference for reliance on market penetration of energy efficient technologies as the preferred method to measure savings resulting from DSM programs. We would take the data on pages 106 and 107 as reflecting the inherent limitations in the measurement of DSM program savings based on top-down estimates. We do not know how the participants estimated their savings on pages 106 and 107.

Question 124 – (SEC Question 27)

Can Concentric comment on the suitability of the Board implementing a system of emissions targets similar to those in Great Britain in place of the TRC or SCT target approach?

Concentric believes that distinct emission reduction targets, such as those used in Great Britain, are likely to be required in the future. For this reason, Concentric believes our approach and recommendations are an appropriate interim step. Explicit GHG reduction targets have not yet been established for the Province. It is therefore premature to pursue targets at the utility level.

Question 125 – (SEC Question 28)

How does Concentric propose the Board can ensure that only market penetration results directly caused by activities of the distributor be counted in targets and results? If market penetration results not caused by distributors are intended to be counted, please describe how the impacts of changed regulations, price elasticity, and similar factors should be dealt with.

Concentric believes that the annual Evaluation Reports should assist with the determination of attribution for market penetration. Additional customer surveys may also be required. See also see the response to SEC Question 18 (Question 78).

Question 126 – (SEC Question 29)

Please describe how the use of market penetration metrics in the manner proposed by Concentric can be expected to affect program design.

Concentric believes that the use of market penetration metrics will affect program design. Gas utilities will focus on programs involving deployment of energy efficient technologies with known and quantifiable energy savings. Examples of such programs include high efficiency furnaces, high efficiency water heaters, and thermal envelope measures for which specific energy performance characteristics can be measured, and for which there is an effective baseline level of deployment in the Ontario market. These types of programs will be emphasized over those that are more customer behavior-oriented, and for which results cannot be effectively measured.

Question 127 – (SEC Question 30)

How should metrics and targets be structured to incent “deep savings”, as proposed on page 118?

Concentric believes that, in order to structure metrics and targets to incent “deep savings,” utilities must be suitably incented to bring these programs forward. We expect that, with the Societal Cost Test, more deep energy savings programs will be justified; a societal discount rate will promote further penetration of these programs. In addition, the Board can exercise its discretion in varying the incentive structure to drive more attention to deep energy savings programs. The steep learning curves commonly associated with deep energy savings programs are likely to require utilities to deploy capital with longer term paybacks. Because deep savings are often significantly more difficult to achieve, appropriate metrics and associated incentives may be warranted to encourage utilities to pursue these programs.

Question 128 – (Union Question 15)

How would Best Available Technologies (“BAT”) be determined and by what criteria? For example, where natural gas or carbon emissions reductions are not maximized by the same technology, which would be used to determine the BAT?

Concentric suggests that the ENERGY STAR program in the U.S. and Canada might be a useful guidepost in establishing the parameters for how to determine the BAT. Please see the response to CCC Question 16 (Question 112) for more information regarding the ENERGY STAR program.

If natural gas reductions and carbon emission reductions are not maximized by the same technology, Concentric believes the Board would need to determine which priority was more important at the time the issue arose. Alternatively, the Board might find that both technologies are beneficial in achieving the energy efficiency goals of the Province.

Question 129 – (Union Question 16)

Who would be the arbiter of what represents the best available technologies?

Concentric’s Report did not address this issue. However, we believe the Board would be the ultimate arbiter if there was a dispute concerning what represents the best available technologies. This question, however, appears to be predicated on the notion that only one technology can be considered “best.” Under the ENERGY STAR program, any product that meets the energy saving criteria prescribed by the EPA is eligible to receive the ENERGY STAR product label. The Board, in conjunction with utilities and stakeholders, may determine this is a suitable definition of “best”, or adopt a single standard, by end-use application.

Question 130 – (Union Question 17)

In relation to the BAT in the commercial and industrial sectors specifically;

- a) Please provide clarification on how BAT would be utilized where more sophisticated technological solutions are required.
- b) Who would be the arbiter of what represents the BAT for the distinct needs of a given facility or application?
- c) Please provide specific examples of how BAT is used in other jurisdictions in the commercial and industrial sectors.
- d) Confirm that Concentric agrees that BAT penetration may not be appropriate in the commercial and industrial sectors where most programs are custom in nature in which case TRC or SCT targets should be adopted.

Please see the response to CCC Question 16 (Question 112). In addition:

- a) In cases where the application is unique (e.g., a customized industrial solution), the distributor should propose and substantiate this application as “BAT”. Otherwise, see response to (d), below.
- b) The Board is the ultimate arbiter, and it would presumably rely on the distributor for its technical support and its independent consultant if additional technical support is required.

- c) BAT standards are more common for residential and commercial than industrial sector applications. A list of Energy Star rated product categories from Canada's Office of Energy Efficiency lists the following:

Appliances

- Water Coolers
- Clothes Washers
- Dehumidifiers
- Dishwashers
- Refrigerators
- Freezers

Heating, Cooling and Ventilation Equipment

- Air conditioners – Central
- Air conditioners – Room
- Boilers – Oil or Gas (Residential)
- Ceiling Fans
- Furnaces (Forced-Air) gas, propane, oil
- Heat pumps – Air source
- Heat pumps – Ground Source
- Programmable Thermostats
- Ventilating Fans
- Water Heaters

Lighting

- Compact Fluorescent Lampl (CFLs)
- Decorative Light Strings (DLS)
- Residential Light Fixtures

Windows and Doors

- Windows
- Sliding Glass Doors
- Entry Doors, Sidelights and Transoms
- Skylights

Electronics

- Audio and DVD Products (residential)

- Digital-to-analog converter boxes
- External power adapters
- Telephony (cordless telephones, answering machines)
- TVs and TV/VCR/DVD Combinations

Office Equipment

- Computers
- Displays
- Imaging Equipment (Multi-function devices, photocopiers printers, fax machines, combination printer/fax machines and mailing machines scanners)

Commercial and Industrial Products

- Commercial Clothes Washers
- Commercial Dishwashers
- Commercial Fryers
- Commercial Hot Food Holding Cabinets
- Commercial Ice Machines (Ice Makers)
- Commercial Steam Cookers
- Commercial Solid Door Refrigerators and Freezers
- Rebuilt Refrigerated Beverage Vending Machines

These products may be supplemented by other standards applicable to Ontario.

- d) Where DSM measures are unique or custom solutions, the BAT standard may not be applicable and therefore gas savings as a target could be substituted.

Question 131 – (Union Question 18)

For market penetration measurement, how does Concentric propose market assessments would be conducted for both the baseline and ongoing annual measurement? Is the expectation that this will be done through primary research?

As indicated on page 108 of the Report, the market penetration metric would require gas distributors to establish a baseline of the existing circumstances in Ontario for each energy efficiency and conservation measure by conducting an inventory assessment. As Union suggests, Concentric expects this would be accomplished through a physical assessment of customer locations throughout the Province. Secondary research would be more cost effective, but primary research may be required to fill out gaps in the data. This data would require updating on a periodic basis, and could be accomplished incrementally with the Evaluation reports, and more thoroughly with periodic customer surveys. The bottom line is that to deliver effective DSM programs, utilities require a detailed understanding of how their customers are using energy.

Question 132 – (Union Question 19)

Based on Concentric’s assessment of other jurisdictions what degree of accuracy, given budget constraints, would be recommended for market penetration studies? What market penetration accuracy levels and margin of error bands were deemed achievable in these jurisdictions and did it vary by sector?

This question would require additional research and analysis.

Question 133 – (Union Question 20)

Please comment on the feasibility of top-down gas use reduction targets given the conclusion by Pacific Economics Group (“PEG”) that there is insufficient data in Ontario to develop top-down measurement of the impact of utility conservation programs.

- a) If percentage reduction of gas consumption is deemed viable in spite of PEG’s findings, please illustrate the methodology used in other jurisdictions as presented in the table on page 107 of the report. Please clarify if these results were utilized for measurement towards incentive achievement in these jurisdictions.
- b) If percentage reduction of gas consumption is deemed not to be viable given PEG’s findings, what would Concentric recommend as other metrics of measurement where market penetration is not feasible. Would a bottom-up approach be recommended for specific sectors?

Concentric recommends the use of market penetration of BAT where possible. Where such quantifiable metrics are not available (e.g., certain market transformation programs), then other metrics must be utilized (e.g., bottom up estimates, by program). We recognize, as indicated in PEG’s report, the challenge of accurately estimating the direct impact of DSM programs using a “top-down” approach. As Ontario moves to a requirement for GHG reductions, such estimates will become both appropriate and necessary. Over time, with additional data and modeling resources, the results of these models may improve. In the interim, a combination of bottom-up and aggregate consumption trends will have to be relied upon as long as utilities, regulators and their stakeholders find it in the public interest to make these investments.

Question 134 – (Union Question 21)

Please confirm whether Concentric is recommending an individual target and incentive for each program. Would this vary between programs measured by market penetration vs. programs measured by other metrics as outlined in Concentric’s response to question 20?

Concentric recommends an individual target (such as percentage of market penetration achieved or gas savings) for each DSM program. However, incentives would be determined for the performance of the portfolio of programs classified as Resource Acquisition Programs, Market Transformation Programs, and Low-Income Programs.

Question 135 – (Union Question 22)

What measurement approach does Concentric recommend for behavioural programs?

Concentric has not recommended a separate measurement approach for behavioral programs. Please see the response to Union Question 23 (Question 136) below, which describes how Concentric would measure market transformation programs, of which we consider behavioral programs to be a subset.

Question 136 – (Union Question 23)

Does Concentric recommend that the target for market transformation programs continue to be measured through a scorecard approach?

As stated in our report, Concentric believes that market penetration is the best measure of program effectiveness. In instances where it is difficult to measure market penetration, another objective measure, such as reduction in gas use attributable to the DSM program or measure can be suitable as well.

Market transformation programs are not always amenable to a quantitative or formulaic evaluation approach, and therefore should be assessed on an individual basis using metrics which are suitable to a particular program. A scorecard approach may be effective at measuring the effects of these market transformation programs.

Question 137 – (Union Question 24)

Please provide the rationale for Concentric's recommendation that market penetration and percentage gas reduction per customer be utilized as the appropriate measurement metrics for low-income programs given the agreed upon recommendation from the Low-Income Conservation Working Group on a set of performance metrics to be utilized and measured through a scorecard approach.

Concentric's recommendation is based on the rationale that low-income customers are residential customers whose energy savings would occur primarily through installation of energy efficient appliances and home insulation, both of which can be measured either through market penetration or gas savings from the program.

Issue #8: Shareholder Incentive Mechanism

Question 138 – (BOMA/LMPA Question 4.A)

For each of the states shown in Table 24 that provide for a penalty provision, please provide specific information on the level of performance below which the penalty provision applies and what and how the penalty is applied.

Table 24 indicates that California, Washington, and Great Britain impose penalties on gas utilities for failure to achieve DSM program goals. Concentric did not investigate the specific threshold percentages for each jurisdiction. The table indicates that for California this percentage is well below 100% of the target level. A more complete response would require additional research. As noted on page 119 of the Report, Concentric recommends that we do not believe that penalties for failing to achieve 100% success are advisable.

Question 139 – (BOMA/LMPA Question 4.B)

Please confirm that the six states shown in Table 24 are the only ones out of the twelve states shown in Table 2 that have financial incentives/penalties. If this cannot be confirmed please provide details on the incentives/penalties for the other states where they are applicable.

The information presented in Table 24 is intended to present a representative sample of jurisdictions that offer financial incentives and/or impose financial penalties related to gas DSM programs. Concentric did not research the shareholder incentive mechanisms in each individual jurisdiction. Therefore, we cannot provide additional details on the incentives/penalties for the other states in our sample without conducting additional research.

Question 140 – (CCC Question 15)

p. 97 - In the absence of an annual evaluation for all programs how would the appropriate incentives and lost revenue adjustments be determined?

Please see the response to Question 52.

Question 141 – (CCC Question 17)

p. 119 - What type of incentive model is Concentric recommending for low-income programs?

Concentric does not anticipate that the incentive model for low-income programs would be significantly different than that for Resource Acquisition Programs or Market Transformation. However, the factors to consider in determining the incentive might be slightly different. As indicated on page 119 of the report, Concentric recommends that the Board develop a separate financial incentive mechanism for low-income programs that is contingent on market penetration, reductions in gas consumption, and efforts to reduce customer bills through education and awareness programs for low-income customers.

Question 142 – (CCC Question 18)

p. 118 - The paper states that Concentric recommends that the financial incentive mechanism be primarily tied to the success of the gas distributor in achieving predetermined market penetration levels for each DSM technology. How, specifically, should that incentive be designed? From Concentric's perspective how should the Board determine what levels of financial incentives is appropriate? How would this work for custom programs?

Concentric's Report did not offer specific recommendations regarding the design of the shareholder incentive mechanism. Rather, the Report provided relevant factors to be considered in the determination of the financial incentive calculation. For example, on page 118 of the Report, Concentric recommends that the financial incentive mechanism be primarily tied to the success of the gas distributor in achieving pre-determined market penetration levels for each DSM technology. Further, Concentric recommends that the Board set metrics and targets for gas distributors so that they are incented to pursue DSM measures that provide deep energy savings. Additionally, Concentric recommends that the Board develop an incentive formula that considers the magnitude by which the gas distributor exceeds certain metrics or targets, including market penetration, reduction in gas consumption, and/or contributions toward reductions in carbon emissions.

Concentric's Report has not made any recommendations concerning how the Board should determine what levels of financial incentives are appropriate. As noted on page 118 of the Report, the NRRI has observed that utilities need adequate financial incentives so that they will design DSM programs that encourage customer participation. Table 25 provides a small sample of financial incentive payments for selected U.S. gas distributors. However, as noted on page 115 of the Report, there is very limited information concerning the financial incentives earned by gas distributors in the jurisdictions covered by our research.

Question 143 – (EGDI Question 27)

Concentric advised at the Stakeholder Conference that it does not support the use of updated best available information in a backwards or retroactive manner in respect of the program administrator costs ("PAC") test or selection of best available technology. That is, if the best available information was used by a utility at the time that the PAC is undertaken, technologies assessed and programs are designed and prioritized, Concentric takes the position that best available information which is generated after-the-fact should not be used to go back and reconsider and question the choice of the programs chosen.

Specifically, it would not be open for parties, based on newer information or the development of a new or better technology becoming available, to question the decision by a utility to proceed with a program .

On page 119 of the Report, Concentric states "... the Board-approved assumptions are updated annually based on the results of the evaluation report. When input assumptions are updated, Concentric believes that it is appropriate to use best available information for purposes of calculating the financial incentive payment." Please clarify that use of best available information and updated assumptions would apply to the calculation of the program results and incentive

a. for the next full program year OR

b. the current year.

Concentric recommends that the use of best available information and updated input assumptions would apply to the calculation of the program results and incentives for the next full program year, with the exception of LRAM. Please see the response to EGDI Question 9 (Question 52).

Question 144 – (EGDI Question 28)

If (b) above, how does Concentric reconcile its position in respect of the PAC test and best available technology with the position regarding program results and incentives? More specifically, where a program is designed and targets are set on the basis of the best available information at the time, why should the results of that program be challenged by reason of a study or research undertaken after the time that a program is designed and put into operation?

N/A

Question 145 – (EGDI Question 29)

If Concentric continues to advocate retroactively changing input assumptions, for the purposes of evaluating the performance of a program, does Concentric agree that the same input assumptions used to develop the targets for the program should also be retroactively changed?

N/A

Question 146 – (EGDI Question 30)

Is Concentric recommending that the overall incentive be apportioned between programs based on the societal benefits (SCT test)?

Concentric did not explicitly recommend a formula for incentive apportionment.

Question 147 – (EGDI Question 31)

If so, how does Concentric propose that the societal benefits of market transformation programs and programs based on a market penetration metric be calculated?

The estimated societal benefits for each program should be estimated as part of the input assumptions developed at the outset of each DSM program cycle, with the aid of an independent consultant, and updated, as necessary, with the annual evaluation reports.

Question 148 – (EGDI Question 32)

Is Concentric recommending that the Ontario Energy Board use the societal benefits to assign a higher incentive rate to programs that it wishes Gas utilities to accelerate?

No. As noted in response to EGDI Question 30 (Question 146), Concentric did not explicitly recommend a formula for incentive apportionment. We believe the Board should use its discretion

to apply incentives to programs warranting jumpstarting or greater emphasis than the societal test alone might dictate.

Question 149 – (EGDI Question 33)

If Concentric is recommending that program incentives be apportioned on the basis of societal benefits, how does that reconcile with the recommendation that the utilities prioritize programs based on the PAC test?

The PAC test is only used to prioritize spending levels for programs that would pass the Societal Cost Test, but be limited by the annual spending cap (e.g., 4- 6% of distribution operating revenues).

Question 150 – (EGDI Question 34)

How does Concentric propose that value for the 100% incentive level be established?

As indicated on page 119 of the Report, Concentric recommends that gas distributors should not be eligible to receive financial incentive payments if they do not exceed the established DSM metrics and targets for each program (i.e., resource acquisition, market transformation, and low-income). On page 118, Concentric recommends that the Board develop an incentive formula that considers the magnitude by which the gas distributor exceeds certain metrics or targets including market penetration, reductions in gas consumption and/or contributions toward reductions in carbon emissions. This combination of metrics and targets can be used to establish the 100% incentive level for each individual DSM program.

Question 151 – (EGDI Question 35)

How does Concentric propose the 100% target level be set for the resource acquisition programs, market transformation programs and research and development programs?

Concentric's Report does not specifically address this question. However, implicit in our recommendation is the notion that the 100% target for resource acquisition programs should be tied to either market penetration of the Best Available Technologies or reductions in gas consumption attributable to DSM programs.

Question 152 – (EGDI Question 36)

How is Concentric's proposal a simpler and more transparent framework than the current graduated incentive for TRC based programs and scorecard approach for market transformation programs?

We would agree that the Societal Test requires additional input variables, but this additional complexity is consistent with Ontario's broader energy and environmental public policy objectives. The 100% target requirement for incentive payout (or 80% as recommended by the Minister of Energy and Infrastructure in Minister's March 31, 2010 Directive to the Board) does not create additional complexity. Concentric favors the existing scorecard approach for Market Transformation programs where BAT measures are unavailable or impractical.

Question 153 – (SEC Question 31)

Please provide an update of the status of the review of SSM in California you have described in footnote 23 on Page 28.

This question would require additional research.

Question 154 – (SEC Question 32)

Please describe in more detail the structure of the incentive mechanism that is being proposed. While we understand the recommendation to have incentive until 100% of the target is reached, is it intended that the incentive be all or nothing? Is a program by program incentive being proposed? How would this be established? What, in Concentric's view, is the appropriate level of incentive, and should that level be calculated by reference to SCT or TRC benefits, DSM budget, or some other criterion?

The financial incentive mechanism should be designed to encourage gas distributors to pursue aggressive targets that result in significant progress toward market penetration of the Best Available Technologies and meaningful reductions in gas consumption per customer. The current incentive structure does not appear to provide sufficient impetus for utilities to go beyond the generic solutions to energy efficiency. Concentric recommends that the Board develop an incentive formula that considers the magnitude by which the gas distributor exceeds certain metrics or targets, including market penetration, reduction in gas consumption, and/or contributions toward reductions in carbon emissions.

Concentric recommends that gas distributors should not be eligible to receive financial incentive payments if they do not exceed the established DSM metrics and targets for each program (i.e., resource acquisition, market transformation, and low income), whether it be for market penetration, energy savings, or carbon emission reductions. Concentric recommended that gas distributors should be rewarded for achieving 100% of program success (although we acknowledge the Minister of Energy and Infrastructure's recommended 80% threshold to the OPA, and we accept this as a reasonable compromise). Conversely, we do not believe that penalties for failing to achieve 100% success are advisable.

For low income programs, Concentric recommends that the Board develop a separate financial incentive mechanism that is contingent on market penetration, reductions in gas consumption, and efforts to reduce customer bills through education and awareness programs for low income consumers.

Question 155 – (Union Question 25)

Is Concentric recommending that the annual incentive mechanism be based on progress towards annual or multi-year targets? Please clarify how the annual incentive would be structured under Concentric's recommendation.

Concentric did not specify the structure of the incentive payment. Concentric believes that multi-year targets may be more appropriate for market transformation programs where year-to-year progress is more difficult to measure. The Board may elect to incent distributors with a certain percentage annual payout for estimates provided in distributor annual program filings, which would be reconciled with program evaluation reports after a multi-year period or the end of the DSM program cycle. Resource acquisition programs could be treated in a similar manner, or continue to be treated as annual targets with annual incentives.

Question 156 – (Union Question 26)

What incentive mechanism methodology is Concentric proposing for resource acquisition programs? Is Concentric recommending the utility be required to meet the 100% target at a portfolio or individual program level? Please outline the methodology and incentive allocation structure for the proposed mechanism which would incorporate market penetration measurement as well as other metrics outlined in response to question 20.

Concentric did not specify the incentive payment structure at the program level. However, we believe the structure suggested in the Draft DSM Guidelines, broken out to Resource Acquisition, Market Transformation, and Low Income programs is a good starting point. Further individual program incentives may be established where both the Board and distributor find that additional program detail will be effective.

Question 157 – (Union Question 27)

Given Concentric's answers to questions 23 & 24, what incentive structure is Concentric recommending for low-income and market transformation programs? Please outline the recommended mechanism.

Concentric has not recommended specific incentive structures. In the report, pp 118-119, we recommend:

For low income programs, Concentric recommends that the Board develop a separate financial incentive mechanism that is contingent on market penetration, reductions in gas consumption, and efforts to reduce customer bills through education and awareness programs for low income consumers.

And:

Concentric recommends that the Board develop an incentive formula that considers the magnitude by which the gas distributor exceeds certain metrics or targets, including market penetration, reduction in gas consumption, and/or contributions toward reductions in carbon emissions.

Question 158 – (Union Question 28)

What incentive structure is Concentric proposing once the utility has met 100% of their target in order to incent them to drive higher DSM results?

Concentric has not recommended a specific incentive structure in the report.

Question 159 – (Union Question 29)

Given Concentric's recommendation that gas distributors should not be rewarded an incentive for achieving less than 100% of program success, has Concentric considered the negative implications that imposing a threshold will have on the continuation of a program if achieving 100% program success does not appear feasible?

If this situation were to arise, we would expect the utility to propose and the Board would consider a lower target, such that achieving 100% of the target was feasible. Otherwise, as suggested, the incentive would no longer be effective.

Question 160 – (Union Question 30)

In those jurisdictions with a threshold, how have utilities performed relative to that threshold?

This question would require additional research and analysis.

Question 161 – (VECC Question 4.A)

Page 27/28

“Shared savings incentives measure actual ratepayer benefits and allow the company to earn a percentage of savings received by customers. A major difficulty with the shared savings incentives is that savings are difficult to measure and verify, and some states have developed problems with the measurement and verification activities required to authorize incentive payments. “

Page 109

“Finally, Concentric believe that similar metrics could be developed for it DSM programs serving low-income customers. Market penetration and the reduction in gas consumption per customer appear to be equally appropriate for this customer segment. However, the targets might be different for certain programs and measures. For example, the Board may want to establish a higher market penetration standard (perhaps 90%) for home weatherization of low-income properties to ensure that energy savings is maximized.”

Page 119

For low income programs, Concentric recommends that the Board develop a separate financial incentive mechanism that is contingent on market penetration, reductions in gas consumption, and efforts to reduce customer bills through education and awareness programs for low income consumers.

Please provide examples of such scorecard/incentive schemes, or alternatively expand on the incentive mechanism(s) using Low Income Weatherization as an example.

Concentric recognizes that there are challenges associated with measuring the success of certain DSM programs, including many associated with low-income consumers. Rather than recommend a particular formula or scorecard for quantifying benefits, we have provided a number of considerations that we believe that Board will want to consider as it determines how best to measure success. These elements include the level of market penetration achieved by programs, discreet reductions in gas use that can be attributed to program implementation, and other metrics discussed throughout the report.

Question 162 – (VECC Question 4.B)

Should Incentives for Low income programs be higher/lower than for other residential programs based on public good and other non-tangible factors? Please discuss.

This question requires a Board policy decision.

Issue #9: Lost Revenue Adjustment Mechanism

Question 163 – (CCC Question 20)

p. 124 - Concentric is recommending that the Board consider providing gas distributors with the opportunity to request revenue decoupling. If risk to utilities is reduced through the implementation of revenue decoupling how would this potentially impact allowed returns and/or capital structure? Should the issue of revenue decoupling be decided by the Board prior to making any decisions regarding the DSM framework or, from Concentric's perspective can these two consultation processes proceed independently?

This question requires a Board policy decision, and is beyond the scope of Concentric's report.

Question 164 – (EGDI Question 37)

Was Concentric aware of the extent of the decoupling that has already been implemented as a result of EGD's existing incentive regulation ("IR") framework?

Concentric has general knowledge of Enbridge Gas Distribution's incentive regulation framework. However, our recommendation on page 124 of the Report to allow gas distributors the opportunity to request revenue decoupling is based on the trend in other jurisdictions toward decoupling as the most appropriate mechanism to remove any financial disincentive the utility may have to propose energy efficiency and conservation programs.

Question 165 – (EGDI Question 38)

Does Concentric agree that consideration of DSM decoupling should be deferred until completion of the current IR period (i.e., to the end of 2012)?

Concentric does not have an opinion on this question. This is a Board policy decision.

Question 166 – (Union Question 31)

The current LRAM mechanism does not provide for the recovery of contract peak demand reductions as a direct result of DSM program implementation. As it was not explicitly addressed in the report, does Concentric endorse capturing the recovery of this revenue reduction where it is directly linked to a DSM initiative to prevent the natural gas distributor from experiencing lost revenue as a direct result of DSM?

While we have not examined this issue explicitly, as a general premise, we endorse full recovery of lost revenues due to DSM programs so utilities will be either incented, or at least held neutral with respect to promoting conservation policy objectives.

Question 167 – (VECC Question 5.A)

Page 124

"Concentric recommends that the Board consider providing gas distributors with the opportunity to request revenue decoupling. This sends the signal that regulators recognize the risks associated with

cost recovery due to declining average use per customer, and are willing to provide utilities with the opportunity to recover all reasonable and prudent costs regardless of customer usage. Allowing gas distributors revenue stability through revenue decoupling removes any financial disincentive to propose energy efficiency programs that might result in significant reductions in consumption.”

Page 125

“If revenue decoupling is not adopted by the Board, or until such time as it is implemented, Concentric believes that the necessary information is available to calculate the LRAM based on energy savings (which is contained within the Societal Cost test and Program Administrator Cost test) and market penetration (which is the primary metric we recommend for measuring program success). Further, if the Board continues to rely on the LRAM, Concentric recommends that the calculation should be based on updated input assumptions. However, we agree with Enbridge that it is reasonable to establish a date by which information used to calculate LRAM must be submitted.”

What should be the adjustment to the allowed ROE for revenue decoupling? Cite any examples where ROE has been reduced to reflect lower utility/shareholder risk

This question is beyond the scope Concentric's Report.

Issue #10: Impact Evaluation

Question 168 – (CCC Question 21)

p. 132 - Concentric is recommending that the utilities be subject to independent program evaluation and third party audit of program results. Would stakeholders have any input into that process? Please explain how the process would be carried out.

As indicated on page 132 of the Report, Concentric recommends that the OEB appoint the entities that are responsible for conducting the independent program evaluation and the third-party audit of program results. Concentric anticipates that stakeholders, through the Evaluation and Audit Committee, would have input into the process in terms of defining the parameters/scope of the evaluation and the audit and reviewing the results of the program evaluation. Concentric views this as a collaborative process, led by the Board or the OEB staff members who are designated to oversee the DSM program and evaluation audit process.

Question 169 – (EGDI Question 39)

What is the basis of the recommendation that the Board appoint DSM evaluators and auditors and manage their work? Please describe the issues which this recommendation would address.

As indicated on page 132 of the Report, Concentric recommends that the OEB appoint the entities that are responsible for conducting the independent program evaluation and the third-party audit of program results. This recommendation was based on the concerns expressed by stakeholders regarding whether the DSM evaluators and auditors could be considered independent when they are selected by the gas distributor. Because measurement of program results is such an important component of assessing whether DSM programs have been effective, Concentric believes that the Board should appoint the DSM evaluators and auditors. As noted on page 132 of the Report, this recommendation is designed to enhance transparency, confidence and trust among stakeholders that the DSM program evaluation and the program audit are being conducted by independent entities chosen by the OEB.

Question 170 – (EGDI Question 40)

Which of the following activities/measurements are considered within the proposed utility "evaluation, monitoring and verification" budget of 3-5% of total DSM budget:

- a. studies to establish and/or update input assumptions (e.g. energy savings, incremental costs, free ridership, etc.)
- b. baseline market penetration studies
- c. post-program market penetration studies
- d. process evaluation (e.g., customer satisfaction studies, program delivery effectiveness studies, etc.)
- e. large custom project verification studies
- f. prescriptive program verification studies
- g. audit of DSM program results

Concentric did not specifically address which activities/measurements are considered within the EM&V budget in our Report. However, our research indicates that items (c) through (g), and the updating of input assumptions in (a) have been implemented in the EM&V programs in other jurisdictions, and we feel that they would be appropriate for inclusion in an evaluation protocol in Ontario.

Item (a) to establish input assumptions and (b) are more closely related to developing and delivering DSM programs, and should therefore be funded from the non EM&V program budget.

Question 171 – (EGDI Question 41)

Which of the evaluation and audit activities in the above question is Concentric proposing that the Board take responsibility for selection of the contractor and management of the study. Please provide a detailed list of the evaluation work that Concentric envisions being managed by OEB Staff.

Concentric did not propose which evaluation and audit activities the Board should take responsibility for selecting the contractor and management of the study. However, the general principle expressed in the recommendations for Issue #10 is that the Board should take responsibility for selecting the DSM program evaluators and auditors. As indicated on page 132 of the Report, Concentric recommends that the Board consider assigning one or two OEB staff members to oversee the DSM program and evaluation audit process. Concentric anticipates that oversight would involve most, if not all, of the activities listed in Question 40 above.

Question 172 – (EGDI Question 42)

Please confirm that it is Concentric's recommendation that the gas utilities would continue to manage verification studies and produce the Annual Report.

Concentric did not make a recommendation regarding the management of verification studies in the Report. Concentric anticipates that the gas distributor would continue to produce the Annual Report, and conduct independent verification studies on large projects if deemed beneficial to program design and funding.

Question 173 – (GEC Question 1.G)

Please confirm that we have correctly understood Concentric's views on the following points:

Concentric's recommendation for evaluations and audits is to retain the Evaluation and Audit Committees as they exist today, except that they would be chaired by a Board appointee (likely a Board staff member) rather than by the utilities. Under this model, the appointment of evaluators and auditors would be a Board staff decision made in consultation with the committees, with all E&A activities funded by a charge levied on the LDC.

As stated on page 132 of the Report, Concentric recommends that the OEB appoint the entities that are responsible for conducting the independent program evaluation and the third-party audit of program results. The Report does not make a specific recommendation regarding the funding mechanism for Evaluation and Audit activities, but we would expect distributor based funding.

Question 174 – (GEC Question 1.H)

Please confirm that we have correctly understood Concentric’s views on the following points:

The 3-5% of DSM budget recommendation for evaluation relates solely to spending on impact evaluation. Thus, it does not include research designed principally to inform new DSM initiatives. Such research should be funded from the program delivery budget.

Concentric agrees that research related to new DSM initiatives should be funded through the program delivery budget, not the EMV budget.

Question 175 – (Union Question 32)

Can Concentric please provide the rationale which formed the basis of the recommendation for the Board to select the evaluators and auditor, define the parameters of these projects and review the results?

Please see response to EGDI Question 39 (Question 169) above.

Question 176 – (Union Question 33)

Confirm that the evaluation report and audit report refers to the same document.

No. As indicated on page 134 of the Report, Concentric understands that gas distributors file an annual Evaluation Report (also called an “Annual Report”) on the activities and results of the DSM programs undertaken, summarizing the savings achieved, budget spent and the evaluations conducted in support of those numbers. An independent third party audit of the Evaluation Report is required. We understand these to be separate, but related reports today.

Question 177 – (VECC Question 8.A)

Page 132

“Concentric anticipates that the Board would be responsible for selecting the program evaluator(s) and the program auditor, for defining the parameters of the evaluation and the audit, and for reviewing the results. Concentric believes the Board should consider assigning one or two OEB staff members to oversee the DSM program and evaluation audit process, thereby minimizing the impact of this recommendation on the Board’s limited resources”

Does this recommendation result in elimination of the EACs? If so how utility and Stakeholder input to be engaged/provided?

No, Concentric’s recommendation would not result in elimination of the Evaluation and Audit Committee (“EAC”). As indicated on page 132 of the Report, Concentric anticipates that stakeholders, through the EAC, would have input into the process in terms of defining the parameters/scope of the evaluation and the audit and reviewing the results of the program evaluation. Concentric views this as a collaborative process, led by the Board or the OEB staff members who are designated to oversee the DSM program and evaluation audit process.

Question 178 – (VECC Question 8.B)

Cite examples of regulator-centered/controlled evaluations and indicate how ratepayers are engaged/protected in these jurisdictions.

In California, the CPUC Energy Division is responsible for managing and contracting for all evaluation, measurement and verification (EM&V) studies. The CPUC solicited and reviewed extensive input from stakeholders both when developing California’s long term strategic plan for demand side management and energy efficiency programs, and when during rulemaking proceedings that establish procedures for implementing the evaluation program.

In Connecticut, to ensure independence in the evaluation process, the Energy Conservation Management Board (ECMB) oversees and coordinates (with utility input) the evaluation process including the selection of independent third party evaluators and review and approval of the evaluation results. As described beginning on page 139 of our report, the opportunities for stakeholders to provide comment and feedback, and to otherwise influence the evaluation process are extensive.

In Massachusetts, utilities have proposed that DOER bear responsibility for future strategic planning and prioritization of EM&V studies, in coordination with the utilities and with the approval of the Energy Efficiency Advisory Council (EEAC). The utilities have proposed cyclical audits of the evaluation process and results by a third-party expert independent of both the utilities and the DOER/EEAC. The EEAC—which has a large role in the development and evaluation of EE programs—is composed of representatives from numerous stakeholder groups, including customers, the environmental community, businesses, etc.

Question 179 – (VECC Question 8.C)

Is CEA aware that independent evaluation of electric utility CDM has resulted in most LRAM/SSM claims (Post evaluation) being modified after critical review by ratepayers and the Board?

Concentric is not aware, but would not be surprised to learn that requested amounts for lost revenues and shareholder incentives were modified as a result of the independent evaluation review process. We see this as an appropriate check and balance mechanism in addition to providing insights into program effectiveness.

Issue #11: Filing and Reporting Requirements

Question 180 – (Union Question 34)

Under Concentric’s recommendations please outline any filing and reporting requirements which differ from the current Annual Report.

As stated on page 137 of the Report, Concentric endorses the OEB’s proposed annual reporting and evaluation reporting requirements as set forth in the DSM Draft Guidelines.

Issue #12: Stakeholder Input

Question 181 – (CCC Question 22)

p. 141 -Please explain Concentric's proposal for stakeholder input into the development, design and evaluation of DSM programs. What specific process does Concentric envisage?

As indicated on page 141 of the Report, Concentric endorses the Board's current approach to soliciting stakeholder input. Our understanding is that the Board's existing DSM Framework indicates that distributors should engage and seek advice from a variety of stakeholders and experts in the development and operation of their DSM programs. However, the gas distributor is ultimately responsible for the development and delivery of cost effective DSM programs in its franchise area, and the stakeholders serve in an advisory capacity. Concentric understands that each gas distributor is expected to hold a minimum of two DSM consultative meetings per year with stakeholders. The purpose of these meetings is: 1) to review annual DSM program results; 2) to select an Evaluation and Audit Committee; and 3) to review the completed program evaluation results.

Question 182 – (EGDI Question 43)

What role does Concentric envision for the Evaluation and Audit Committee in respect of program evaluation and audit if the process will be managed by the Board in future.

As indicated on page 132 of the Report, Concentric anticipates that stakeholders, through the Evaluation and Audit Committee, would have input into the process in terms of defining the parameters/scope of the evaluation and the audit and reviewing the results of the program evaluation. Concentric views this as a collaborative process, led by the Board or the OEB staff members who are designated to oversee the DSM program and evaluation audit process.

Question 183 – (GEC Question 4)

Concentric notes that "Connecticut has one of the most inclusive and progressive methods of involving stakeholders in the development of DSM programs." (p. 139) It also suggests that stakeholder processes such as Connecticut's have "the potential to slow down development and delivery of cost-effective or innovative DSM programs..." (p. 141). Does Concentric have any evidence that this adverse effect is realized in Connecticut? What about in neighbouring Massachusetts or Rhode Island where similar systems are in place? Apart from California (where everything is seemingly very complex and even sometimes byzantine) does Concentric have concrete examples of how more formal stakeholder processes have either significantly slowed program development, hurt innovation or been more costly (after accounting for litigation and other regulatory costs avoided) than less formal mechanisms?

Concentric's research of other jurisdictions indicated that bureaucratic processes have slowed progress administering DSM programs in a variety of ways in several states (CT, MA, and CA). By way of example, in July of 2009 National Grid continued to submit supplemental compliance filings in support of performance and benefit/cost claims for programs operated in Massachusetts during

2007. As suggested in the question, delays have also hampered timely payment of incentives in California. The California utilities only received incentive payments for programs that had been operating from 2006-2008 on December 15, 2009.

Issue #13: DSM Gas/Electric Program Integration

Question 184 – (Union Question 35)

What attribution methodology and administrator flexibility does Concentric recommend to facilitate integration of the opportunities indicated in the report (e.g. program delivery of home energy audits, low-income community programs, etc.).

Concentric's recommendation regarding attribution would not change. As indicated on page 69 of the Report, Concentric recommends that the OEB should assign a percentage of credit to the utility based on the percentage of total dollars spent on designing, developing and delivering the joint DSM programs in question. Concentric does not believe that attributing 100% of the benefits to gas distributors that satisfy the "centrality principle" is the most equitable method for attributing program benefits.

However, as stated on page 144 of the Report, Concentric recommends that the Board consider ways in which gas and electric utilities can coordinate, if not integrate, their DSM programs to improve customer participation and to achieve certain administrative efficiencies. Based on our research in other jurisdictions, home energy audits and low-income community programs represent significant opportunities for cost synergies for the gas/electric utility or program administrator.

Question 185 – (Union Question 36)

From a program delivery perspective, please provide examples of how programs are being jointly delivered in other jurisdictions which would be relevant given the marketplace in Ontario. What attribution methodology is in place in these jurisdictions?

In California, natural gas and electricity are governed by the same overarching plan. This provides some synergies and cost reductions for certain integrated offerings (one stop shopping, ease of use, reduced administration, etc.). Savings goals in California are based on "total market gross" savings, meaning that energy savings assessments do not count only savings that are directly attributable to the utility program.

In Connecticut, the same DSM policy applies to electric and gas utilities, resulting in identical program development, administration, evaluation, reporting, etc. Prior to 2010, gas and electric providers submitted separate Conservation & Load Management (C&LM) Plans. However, many of the approved programs were integrated gas and electric programs jointly-operated by CT's gas and electric providers. Beginning in 2010, electric and gas utilities submit a consolidated C&LM Plan and continue to look for ways to further integrate gas and electric programs.³

In Massachusetts, gas and electric utilities have historically engaged in coordinated and integrated activities to serve certain common customers. In the commercial and industrial sector, for example, these efforts have been more informal and have been approached on an individual basis, typically involving extensive efforts to serve large customers in a coordinated fashion. These efforts have resulted in some notable successes throughout the Commonwealth.

³ 2010 Electric and Natural Gas Conservation and Load Management Plan. Docket No. 09-10-03, 08-10-02. October 1, 2009.

Question 186 – (Union Question 37)

Is Concentric aware of any jurisdiction where CDM and DSM frameworks share the same principles which would be relevant given the market structure of Ontario?

Concentric noted in our report, a high level of integration between electric and gas utilities may be difficult because of the market structure. Concentric questions whether integration can occur successfully in Ontario, where there are two natural gas distributors and approximately 80 electric distributors regulated by the Board. The level of coordination and cooperation required to achieve true integration might be untenable, absent a central administrator. Concentric recommends that the Board and OPA consider ways in which gas and electric utilities can coordinate, if not integrate, DSM programs.

The Connecticut experience may be instructive in this regard. As described above and in our report, in Connecticut, the same DSM policy has applied to electric and gas utilities, resulting in identical program development, administration, evaluation, reporting, etc. This method of administration seems to lend itself to greater coordination between similar programs, even if the integration of numerous electric distributors with only two LDCs proves difficult.

James M. Coyne
Senior Vice President

Mr. Coyne provides financial, regulatory, strategic, and litigation support services to clients in the power and utilities industries. Drawing upon his industry and regulatory expertise, he regularly advises utilities, public agencies and investors on business strategies, investment evaluations, and matters pertaining to rate and regulatory policy, capital costs, valuation, fuels, and power markets. Prior to Concentric, Mr. Coyne worked in senior consulting positions focused on North American utilities industries, in corporate planning for an integrated energy company, and in regulatory and policy positions in Maine and Massachusetts. He has authored numerous articles on the energy industry and provided testimony before the Federal Energy Regulatory Commission and jurisdictions in Alberta, California, Connecticut, New Jersey, Ontario, Maine, Texas, Vermont, and Wisconsin. Mr. Coyne holds a B.S. in Business from Georgetown University with honors and an M.S. in Resource Economics from the University of New Hampshire.

REPRESENTATIVE PROJECT EXPERIENCE

Expert Testimony and Litigation Experience

- Commonwealth of Massachusetts, Superior Court, Central Water District vs. Burncoat Pond Watershed District; provided expert testimony on the appropriate method for computing interest in an eminent domain taking. (Civil Action No. WDCV2001-01051, May 2010)
- Retained by the Ontario Energy Board to evaluate the existing DSM regulatory framework and guidelines for gas distributors, and based on research on best practices in other jurisdictions, make recommendations and lead a stakeholder conference on proposed changes. (2009-2010)
- ATCO Utilities: primary cost of capital witness on behalf of ATCO Utilities in the 2009 Alberta Generic Cost of Capital proceeding, for the establishment of the return on equity and capital structure for each of Alberta's gas and electric utilities. (AUC Proceeding ID. 85)
- Enbridge: primary cost of capital witness before the Ontario Energy Board in its Consultative Process on the Board's policy for determination of the cost of capital. (EB-2009-0084)
- Provided written comments to the Ontario Energy Board on behalf of Enbridge Gas Distribution, and separately for Hydro One Networks and the Coalition of Large Distributors in response to the Board's invitation to interested stakeholders to provide comments to help the Board better understand whether current economic and financial market conditions have an impact on the reasonableness of the Cost of Capital parameter values calculated in accordance with the Board's established Cost of Capital methodology; and to help the Board determine if, when, and how to make any appropriate adjustments to those parameter values.
- Atlantic Path 15, LLC: Before the Federal Energy Regulatory Commission, provided expert testimony on the appropriate rate of return, capital structure, and rate incentives for the development and operation of the Path 15 transmission facilities in California. (FERC Docket ER08-374-000)
- Wisconsin Power and Light Company: Before the Public Service Commission of Wisconsin, on establishing ratemaking principles for the company's proposed wind and coal electric generation facility additions, providing expert testimony on the appropriate return on equity. (PSCW Docket Nos. 6680-CE-170 and 6680-CE-171, 2007)
- Aquarion Water Company: Before the Connecticut Department of Public Utility Control, providing expert testimony on establishing the appropriate return on equity for the Company's Connecticut operations. (DPUC Docket No. 07-05-19, 2007)

- Central Maine Power Company: Before the Maine Public Utilities Commission, provided expert testimony on the theoretical and analytical soundness of the Company's sales forecast for ratemaking purposes. (MPUC Docket No. 2007-215, 2007)
- Vermont Gas Systems, Inc.: Before the State of Vermont Public Board, on the company's petition for approval of an alternative regulation plan, provided expert testimony on models of incentive regulation and their relative benefits for VGS and its ratepayers. (VPSB Docket No. 7109, 2006)
- Texas New Mexico Power Company: Before the Public Utility Commission of Texas, on the approval of the company's stranded cost recovery associated with the auction of the company's generating assets. (PUC Docket No. 29206, 2004)
- TransCanada Corporation: Provided an independent expert valuation of a natural gas pipeline, filed with the American Arbitration Association. (AAA Case No. 50T 1810018804, 2004)
- Advised the Board of Directors of El Paso Corporation on settlement matters pertaining to western power and gas markets before FERC. (2003)
- Conectiv: Before the New Jersey Board of Public Utilities, on the approval of the proposed sale of Atlantic City Electric Company's fossil and nuclear generating assets. (NJBPUC Docket No. EM00020106, 2000-2001)
- Bangor Hydro Electric Company: Before the Maine Public Utilities Commission, on the approval of the proposed sale of the company's hydroelectric and fossil generation assets. (MPUC Docket No. 98-820, 1998)
- Maine Office of Energy Resources: Before the Maine Public Utilities Commission on behalf of the Maine Office of Energy on the establishment of avoided costs rates for generators under PURPA. (1981-1982)

Regulatory Support Experience

- For the Canadian Gas Association, facilitated a workshop between Canadian regulators and utility executives on regulatory and utility responses to a low carbon world, and drafted follow-up white paper to facilitate further discussion on emerging industry issues. (2010)
- Retained by Ontario's Coalition of Large Distributors (Enersource Hydro, Horizon Utilities, Hydro Ottawa, PowerStream, Toronto Hydro, and Veridian Connections) to examine the cost of capital for Ontario's electric utilities in relation to those in other provinces and in the U.S. (2008)
- Retained by the Ontario Energy Board to analyze ROE awards for the past two years in Ontario, and compare against other jurisdictions in Canada, the U.S., U.K., and select other European jurisdictions. Differences in awarded ROEs were examined for underlying factors, including ROE methodology, company size, business risks, tax issues, subsidiary vs. parent, and sources of capital. The analysis also addressed the question of whether Canadian utilities compete for capital on the same basis as U.S. utilities. (2007)
- Retained by the Nantucket Planning and Economic Development Commission to educate government officials and island residents on the wind industry, and provide analysis leading to constructive input to the Army Corps of Engineers and the Minerals Management Service on the siting of proposed wind projects. (2004-2007)
- Interim manager of Government and Regulatory affairs for Boston Generating, LLC. Coordinate activities and interventions before FERC, NE-ISO, state regulatory agencies, and local communities hosting Boston Generating power plants. (2004)
- Facilitated the development of an Alternative Regulation Plan with the Department of Public Service and Vermont Gas Systems providing research and advice leading to a rate proposal for the Vermont Public Service Board. Conducted several workshops including the major stakeholders and regulatory agencies to develop solutions satisfying both public policy and utility objectives. (2004-2005)
- For an independent power company, perform market analysis and annual audits of its utility power contract. Services provided include verification of the contract price as a function of its index

components, surveys of regional competitive energy suppliers, and analysis of regional spot prices for an independent benchmark. Meet with PUC staff to discuss and represent the company in its annual adjustment process, and report results to the company and its creditors. (2003-2004)

Financial and Economic Advisory Experience

- Financial advisor to a major international corporation for investments in U.S. nuclear generating units. (2007-2008)
- Lead regulatory and market due diligence advisor to Macquarie Securities in the \$7.4 billion acquisition of Puget Sound Energy. (2007)
- Retained by five Vermont electric utilities to study the comparative economics building the next generation of electric power generation within the state. Working with the utilities, the Vermont Department of Public Service, and the Electric Power Research Institute (EPRI), ten possible generation technologies were analyzed for their economic and environmental attributes. Costs were compared across technologies, and financial impacts including credit rating were examined. The report was presented in public forums and before state agencies. (2007)
- Advisor to the City of Mesa, Arizona for the potential privatization of the City's electric utility. (2007-2008)
- Independent Market Expert for a large Midwestern utility seeking a credit rating for its electric generation subsidiary. Providing a complete PJM and MISO market assessment and forward financial projections for the company's generation business including over 13,000 MW's of generating capacity. Financial projections are based on LMP price projections for the PJM-MISO interconnect, fuels prices, air emissions prices, and complete financial analysis of the business unit. Also provided support for discussions with the major credit rating agencies in conjunction with an investment bank and independent engineer. (2005-2006)
- Completed financial advisory services to a private equity consortium on the successful acquisition of a gas-fired power generating facility. The engagement included evaluation of all revenue streams, confirmation of investment economics under alternative market scenarios, and support for negotiations on key terms. (2005)
- Engaged by Goldman Sachs to assist with the financial and industry due diligence associated with the acquisition of Zilkha Renewable Energy, a wind energy company with over 20 projects under development. (2005-2006)
- Engaged by the State of Vermont to study of the feasibility of acquiring 550MW of hydroelectric generation facilities from USGen-New England. Completed a valuation of the assets, researched financing options with alternative tax-exempt and taxable structures, monitored the status of NEG's bankruptcy proceedings, researched comparable large-scale municipalizations, studied the potential in-state and out-of-state uses for the power, and tested the market for power sales to regional utilities. Facilitated discussions with companies for equity partnership, as well as for the purposes of providing power marketing and O&M services to the project. In addition to in-house consulting staff, compiled a team of legal, engineering and financing experts to deliver a comprehensive work product reflecting all aspects of the risks and benefits of purchasing this unique set of assets out of bankruptcy. (2003-2004)
- Evaluated a major utility's unregulated energy services business units and advised management on valuation and the potential market for the businesses. Developed offering materials and represented the company in negotiations with a potential buyer. (2001-2002)
- Lead advisor in the auction of Conectiv's \$875 million in fossil and nuclear electric generation assets to NRG, PSE&G, and Exelon. Provided expert testimony before the New Jersey Board of Public Utilities on the auction process and asset values. (1999-2002)
- Provided financial and market analysis to Provincial Auditor of Ontario in examination of the long-term lease arrangement for the Bruce nuclear facility between Ontario Hydro and British Energy. (2002)

- For a private equity firm, evaluated on investment in a manufacturer of electric generation equipment. Analyzed the company's sustainable technological advantage, interviewed major customers, assessed competitor positioning, and provided market and revenue projections for the investment evaluation. (1999)
- Served as technical and market advisor for an investment consortium in the evaluation of an investment in five cogeneration plants. Analyzed fuel and off-take contracts, regulatory risk, plant operating procedures, and management personnel. Provided revenue and cost projections, supported bank discussions, and assisted bid negotiations. (1998)
- Co-advisor to Sithe Energies in the auction of the company's North American assets to Reliant and Exelon, and the marketing of its assets in Australia and Asia. (1999-2000)
- Lead advisor in the electric restructuring, auction of generating assets, and long-term power contracting for Denton Municipal Electric. Conducted regular briefings for the City Council. (1999-2001)
- Co-advisor to Sierra Pacific Resources in the proposed auction of 3,000 MW of fossil generating assets. (1999-2000)
- Co-advisor to TXU in the proposed auction of 560 MW of fossil generating assets. (2000)
- Co-advisor to Boston Edison (NSTAR) in the auction of \$536 million in fossil generating assets to Sithe Energy. (1997-1998)
- Co-advisor to GPU in the auction of \$1.7 billion in fossil generating assets to Sithe Energy. (1997-1998)
- Lead advisor to Bangor Hydro Electric Company in the auction of \$90 million in hydroelectric, transmission, and fossil generating assets to PP&L Global. (1998-1999)

Business Strategy Experience

- Retained by a major Canadian electric company to study the cross-border transmission constraints into U.S. power markets and identify strategic options and transmission investments for expanding capacity and energy flows into these markets. (2007)
- Retained by the Western Electric Coordinating Council's (WECC) Board of Directors to facilitate the development of the WECC's five-year strategic plan. WECC is one of eight regional electric reliability organizations in North America, with 180 members across 14 states, and portions of Canada and Mexico. Leading the effort for Concentric, the planning process entails interviewing key stakeholders, facilitating discussion within and across member groups, gathering and presenting research, and making recommendations to the Board on the Strategic Plan. (2007)
- Engaged by a Canadian based utility company to develop its business strategy for growth in the U.S. Working with senior management, providing both a "big picture" strategic assessment of driving forces and opportunities in distribution, transmission and generation, supported by more detailed evaluation of specific investment options for presentation and discussion with its Board. (2005-2007)
- Advisor to Cook Inlet Regional, Inc., an Alaskan Native corporation, for the purpose of developing wind energy projects within the State of Alaska. (2006)
- Advisor to Tamarack Energy, Inc., for the purpose of developing renewable energy projects in the Northeast U.S. (2006)
- Engaged by a major Japanese corporation to provide assistance with the strategic evaluation of its ability to enter the \$400 billion power and gas trading market. Management in Tokyo and New York required an independent assessment of the new and complex U.S. market for power and natural gas, and a determination of the company's ability to successfully compete. (2005-2006)
- Retained by an international power company to assist with evaluation of its corporate strategy and financial performance. Evaluated the company's corporate strategy using modern portfolio management tools to determine the inherent risk/reward trade-offs in the company's business portfolio. Analyzed core drivers of movements in the company's stock price and assisted the

management team with engaging the Board of Directors in a strategic evaluation of the company's electric business. (2004)

- Strategic advisor to a major Public Power Authority in its evaluation of alternative business strategies and organizational structure. Provided industry benchmarking and qualitative analysis of various public power models for the Authority and developed future industry scenarios. Collaborated with team of legal and banking advisors in examining restructuring options to maximize benefits to the Authority's stakeholders. (2004-2005)
- Provided analysis for the FirstEnergy Board of Directors regarding the potential economic impact of the 2003 power outage. (2003)
- Provided a strategic assessment of an eastern utility's electric generation and marketing business. The strategic assessment included: analysis of wholesale and retail electric markets in PJM, NE and NY markets, capacity, energy and ancillary service products, transmission and congestion, customers for wholesale products, competitors, short-term and long-term financial measures of viability, and factors for success. The engagement involved brainstorming sessions with the client team, research and analysis, and concluded with a report and evaluation of the company's strategic options and business prospects. (2003)
- Developed a cost of capital and investment decision-making framework for the company's new business investments. (2002)
- Strategic advisor to a Mid-Atlantic Utility in the development and implementation of the company's generation and marketing business. (1999-2000)

PUBLICATIONS AND RESEARCH

- "Autopilot Error: Why Similar U.S. and Canadian Risk Profiles Yield Varied Rate-making Results" (with John Trogonoski), Public Utilities Fortnightly, May 2010
- "A Comparative Analysis of Return on Equity of Natural Gas Utilities" (with Dan Dane and Julie Lieberman), prepared for the Ontario Energy Board, June, 2007
- "Do Utilities Mergers Deliver?" (with Prescott Hartshorne), Public Utilities Fortnightly, June 2006
- Utility Strategy and Shareholder Return (with Prescott Hartshorne), Public Utilities Fortnightly, October 2004
- "Winners and Losers in Restructuring: Assessing Electric and Gas Company Financial Performance" (with Prescott Hartshorne), white paper distributed to clients and press, August 2003
- "The New Generation Business," commissioned by the Electric Power Research Institute (EPRI) and distributed to EPRI members to contribute to a series on the changes in the Power Industry, December 2001
- Potential for Natural Gas in the United States, Volume V, Regulatory and Policy Issues (co-author), National Petroleum Council, December 1992
- "Natural Gas Outlook," articles on U.S. natural gas markets, published quarterly in the Data Resources Energy Review and Natural Gas Review, 1984-1989

SELECTED SPEAKING ENGAGEMENTS

- "The Use of Expert Evidence," The Canadian Association of Members of Public Utility Tribunals (CAMPUT) 2010 Energy Regulation Course, Queens University, Kingston, Ontario, June 2010
- "A Comparative Analysis of Return on Equity for Utilities in Canada and the U.S.," The Canadian Association of Members of Public Utility Tribunals (CAMPUT) Annual Conference, Banff, Alberta, April 22, 2008

- “Nuclear Power on the Verge of a New Era,” moderator for a client event co-hosted by Sutherland Asbill & Brennan and Lexecon, Washington D.C., October 2005
- “The Investment Implications of the Repeal of PUCHA,” Skadden Arps Client Conference, New York, NY, October 2005
- “Anatomy of the Deal,” First Annual Energy Transactions Conference, Newport, RI, May 2005
- “The Outlook for Wind Power,” Skadden Arps Annual Energy and Project Finance Seminar, Naples, FL, March 2005
- “Direction of U.S. M&A Activity for Utilities,” Energy and Mineral Law Foundation Conference, Sanibel Island, FL, February 2002
- “Outlook for U.S. Merger & Acquisition Activity,” Utility Mergers & Acquisitions Conference, San Antonio, TX, October 2001
- “Investor Perspectives on Emerging Energy Companies,” Panel Moderator at Energy Venture Conference, Boston, MA, June 2001
- “Electric Generation Asset Transactions: A Practical Guide,” workshop conducted at the 1999 Thai Electricity and Gas Investment Briefing, Bangkok, Thailand, July 1999
- “New Strategic Options for the Power Sector,” Electric Utility Business Environment Conference, Denver, CO, May 1999
- “Electric and Gas Industries: Moving Forward Together,” New England Gas Association Annual Meeting, November 1998
- “Opportunities and Challenges in the Electric Marketplace,” Electric Power Research Institute, July 1998
- “New Market Dynamics,” New England-Canada Business Council Annual Meeting, November 1996
- “Fuels Markets and Generation Choices,” Electric Power Research Institute Seminar, Charleston, SC, October 1989
- “Issues Underlying the Long-Term Outlook for Natural Gas Markets,” International Association for Energy Economics’ International Conference, Calgary, Canada, July 1987

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2006 – Present)

Senior Vice President

Vice President

FTI Consulting (Lexecon) (2002 – 2006)

Senior Managing Director – Energy Practice

Arthur Andersen LLP (2000 – 2002)

Managing Director, Andersen Corporate Finance – Energy and Utilities

Navigant Consulting, Inc. (1996 – 2000)

Managing Director, Financial Services Practice

Senior Vice President, Strategy Practice

TotalFinaElf (1990 – 1996)

Manager, Corporate Planning and Development

Manager, Investor Relations

Manager of Strategic Planning and Vice President, Natural Gas Division

Arthur D. Little, Inc. (1989 – 1990)

Concentric Energy Advisors, Inc.

Attachment A

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Senior Consultant – International Energy Practice

DRI/McGraw-Hill (1984 – 1989)

Director, North American Natural Gas Consulting
Senior Economist, U.S. Electricity Service

Massachusetts Energy Facilities Siting Council (1982 – 1984)

Senior Economist – Gas and Electric Utilities

Maine Office of Energy Resources (1981 – 1982)

State Energy Economist

EDUCATION

M.S., Resource Economics, University of New Hampshire, with Honors, 1981

B.S., Business Administration and Economics, Georgetown University, Cum Laude, 1975

DESIGNATIONS AND AFFILIATIONS

NASD General Securities Representative and Managing Principal (Series 7, 63 and 24 Certifications), 2001

NARUC, Advanced Regulatory Studies Program, Michigan State University, 1984

American Petroleum Institute, CEO's Liaison to Management and Policy Committees, 1994-1996

National Petroleum Council, Regulatory and Policy Task Forces, 1992

President, International Association for Energy Economics, Dallas Chapter, 1995

Gas Research Institute, Economics Advisory Committee, 1990-1993

Georgetown University, Alumni Admissions Interviewer, 1988 - current

John P. Trogonoski
Project Manager

Mr. Trogonoski is a project manager with recognized expertise in rate of return, cost of equity, and capital structure issues for public utilities. He has over fifteen years of experience in financial analysis, business valuation, utility regulation, property taxation, and program administration. He has filed expert testimony on rate of return, revenue requirement, cost allocation, rate design, incentive regulation, and policy development. He has a Master's degree in Business Administration and an undergraduate degree in Marketing.

REPRESENTATIVE PROJECT EXPERIENCE

Financial Analysis

Since joining Concentric Energy Advisors in February 2008, Mr. Trogonoski has:

- Assisted in the preparation of testimony and exhibits for Return on Equity analysis for the following clients:
 - Otter Tail Power (Minnesota and North Dakota)
 - Southwestern Public Service (New Mexico)
 - Questar Gas Corporation (Utah)
 - CenterPoint Energy Resources (Texas)
 - Southern Connecticut Gas (Connecticut)
 - Texas New Mexico Power (Texas)
 - Public Service of New Mexico (New Mexico)
 - ATCO Utilities (Alberta)
 - Northern States Power (Minnesota)
 - CenterPoint Energy Resources (Oklahoma)
 - Atmos Energy Corporation (Colorado)
 - CenterPoint (Minnesota Gas (Minnesota)
- Prepared testimony and exhibits for ATCO Utilities in the generic cost of capital proceeding before the Alberta Utilities Commission. Compared the financial and operating metrics of Canadian regulated utilities to their U.S. peer group in order to determine whether the differences in financial or operating performance account for the disparity in authorized returns between U.S. utilities and those that are subject to the Alberta generic formula. Prepared responses to information requests from intervening parties and developed information requests. Prepared rebuttal testimony that considered the impact of the current economic and financial situation on the return on common equity.
- Prepared Cash Working Capital Study for Northern Illinois Gas Company, including development of cash working capital model and drafting written testimony in support of that study.
- Prepared rebuttal testimony for Southwestern Public Service witness concerning the impact of possible authorized returns on equity on the financial integrity and credit rating of the company.
- Assisted in the development of a business valuation for Poseidon Water, LLC by reviewing and validating cost assumptions for construction costs, water rates, and electricity prices. Also developed cost of capital studies for proxy groups of regulated water utilities and wholesale power generators for using in this valuation.
- Analyzed financial information presented by the City of Richmond for purposes of testing the reasonableness of various assumptions used to support the issuance of new municipal bonds.

Concentric Energy Advisors, Inc.

Attachment A

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ATTACHMENT A
RÉSUMÉ OF JOHN P. TROGONOSKI

Reviewed projected revenues and expenses and generated alternative scenarios for consideration by management.

- Assisted EOLFI in determination of whether to purchase an existing wind generation project in the Pacific Northwest. Reviewed cost assumptions and generated alternative scenarios for consideration.
- Prepared a database that graphically portrayed the cost allocation methods utilized by Ameren and Ameren Services Corporation for various work orders and service requests in conjunction with the company's rate case filing in Illinois.

Project Management

- Drafted a research report for the Ontario Energy Board that reviewed low-income energy assistance programs that have been implemented in other jurisdictions, including Canada, the United States, the United Kingdom, the European Union countries, Australia, and New Zealand. Attended hearing and responded to questions related to research report on behalf of OEB staff.

While at the Colorado Public Utilities Commission, Mr. Trogonoski:

- Supervised financial analysts in the energy and telecommunications units from 2004 to 2008. In this capacity, he was responsible for the financial analysis, accounting, and auditing work of between five and nine financial analysts. This work included preparation of expert testimony and recommendations concerning rate cases, applications for alternative forms of regulatory treatment, performance of managerial and financial audits, compliance with relevant statutes and Commission rules, and review of applications for certificates of public convenience and necessity, transfers of authority, franchise agreements, and discontinuance of service.
- Administered the Colorado High Cost Support Mechanism, which provided universal telecommunications service to customers in rural, high costs areas through an assessment on all Colorado customers. Also, he later supervised the position that administered this program.

Regulatory Advisory

While at the Colorado Public Utilities Commission, Mr. Trogonoski:

- Provided expert testimony on rate of return issues, capital structure, cost of debt, financial integrity, and credit quality in numerous rate case proceedings involving energy, telecommunications and water companies including Xcel Energy, Qwest Corporation, and Atmos Energy.
- Performed managerial and financial audits of regulated energy and telecommunications companies using the regulatory and accounting guidelines in the Uniform System of Accounts relied upon by the Federal Energy Regulatory Commission, the Federal Communications Commission, the Financial Accounting Standards Board, and the Commission's rules and regulations.
- Led Staff's investigation into a Competitive Local Exchange Carrier who was providing regulated telephone service to over 14,000 customers without the requisite Commission authority and without an effective tariff. This investigation resulted in a Commission order to cease and desist provision of regulated services, an order to transfer customers to an alternative provider, and sanctions against the principals.
- Led Staff's review of an application for relaxed regulatory treatment by Qwest Corporation. Provided expert testimony regarding Qwest's market share in Colorado relative to cable providers, wireless providers, and Competitive Local Exchange Carriers. Assisted professional market research firm in designing questionnaire to examine customer preferences for purchasing telecommunications services, expectations concerning price and quality of those services, and desire for regulation over those services.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2008 – Present)

Project Manager
Senior Consultant

Colorado Public Utilities Commission (2004 – 2008)

Supervisory Financial Analyst, Telecommunications and Energy

Colorado Public Utilities Commission (1999 – 2004)

Financial Analyst, Telecommunications, Energy and Water

State of Colorado (1994 – 1999)

Property Tax Specialist

Nobel Sysco, Inc. (1992 – 1994)

Marketing Associate

State of Colorado (1989 – 1991)

Tax Appraiser Consultant

EDUCATION

M.S. in Business Administration, University of Colorado at Denver, 1987

B.S. in Marketing, University of Colorado at Denver, 1986

Mark C. Cattrell
Senior Consultant

Mr. Cattrell has provided financial analysis, regulatory advisory services, and public policy analysis on a variety of engagements with Concentric. His projects have included strategic assessments of the U.S. nuclear energy industry, asset valuations, state regulatory and federal litigation cases, nuclear regulatory matters, expert testimony preparation, and client initiated studies on a wide range of energy-related issues.

REPRESENTATIVE PROJECT EXPERIENCE

Financial and Economic Advisory Services

Performed asset valuations and financial modeling associated with spent nuclear fuel litigation. Assessed value of a hydroelectric generating facility for a major US utility by developing a discounted cash flow model. Verified economic assumptions used in appraisal of a proposed desalination facility for a multinational industrial developer. Provided research on comparable transactions, previous mergers and acquisitions, and potential transaction opportunities.

Regulatory Analysis and Ratemaking

Conducted regulatory analysis and economic research for electric and natural gas utilities to support expert testimony in ratemaking proceedings before state regulatory agencies. Conducted research to support testimony associated with the natural gas revenue decoupling. Evaluated economic potential of baseload energy alternatives for leading US renewable energy supplier to support regulatory filings for multi-billion dollar nuclear expansion. Performed a competitive analysis of nuclear performance as part of a benchmarking study. Customized a model to design support rate design recommendations based on cost of service studies.

Energy Market Assessment

Conducted an assessment of the United States nuclear power industry for a European client, including assessment of proposed expansions to present fleet of nuclear generating plants. Created demographic and economic projections to support valuation studies. Evaluated process by which a major western utility conducted long-range resource planning.

Business Strategy and Operations

Performed strategic and competitive analysis of proposed nuclear construction projects. Composed and compiled sections of a major financing application to the Department of Energy. Conducted a study of local statutes, tax policies, and incentives for infrastructure projects.

PROFESSIONAL

Concentric Energy Advisors, Inc. (2008 – present)

Senior Consultant
Consultant

Harvard University (2003 - 2006)

Associate

Janus Associates, Inc. (2001 – 2002)
Jr. Consultant

EDUCATION

M.P.P., Georgetown University, 2008
B.A., Colby College, 2001

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Energy Bar Association
National Association of Business Economics
U.S. Association of Energy Economics

AVAILABLE UPON REQUEST

Extensive client and project listings, and specific references.
