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January 21, 2009

**VIA COURIER AND EMAIL**

Ms. Kirsten Walli
Board Secretary
P.O. Box 2319
2300 Yonge St.
Toronto, ON
M4P 1E4

Dear Ms. Walli,

**Re:    Vulnerable Energy Consumers Coalition (VECC)**
**         EB-2008-0272 Hydro One Networks Inc. – Electricity Transmission**
**         Revenue Requirement Change**

Please find enclosed the interrogatories of VECC with respect to the evidence of AMPCO in the above noted proceeding.

Yours truly,

Michael Buonaguro
Counsel for VECC
Encl.

**HYDRO ONE NETWORKS**
**2009-2010 TRANSMISSION RATE APPLICATION**
**(EB-2008-0272)**

**VECC INTERROGATORIES REGARDING**
**EVIDENCE FILED BY AMPCO**

**A. "DO FIRMS SHIFT DEMAND IN RESPONSE TO HIGH PRICES? AN EMPRICIAL ANALYSIS", EXPERT REPORT OF ANINDYA SEN**

**Question #1**

**Reference:** Page 2, paragraph #7

a) Please provide a schedule that sets out for each of analyzed months in 2006 and 2007, the following:
   - The total "Allocated Quantities of Energy Withdrawn" from the IESO controlled grid (in kWhs)
   - The total "Allocated Quantities of Energy Withdrawn" by each of the five industrial sectors analyzed (in kWhs).

**Question #2**

**Reference:** Page 3, paragraphs 8 & 10

a) Please explain why the effect of the current transmission tariffs on "on-peak" prices was not factored into the formulation of the model.

b) Did the model differentiate between the peak hours on weekdays vs. weekends & statutory holidays as the current transmission tariff does? If yes, how was this done (e.g., were weekends and statutory holiday excluded from the analysis?)?

c) Please provide the model results (similar to Table 1) for the specification set out in footnote #1.

d) Did Dr. Sen also run a regression using the same data omitting the regressor that is the coefficient of the parameter b2, i.e., the HOEP averaged over previous 12 hours? If so, please provide the output produced in running the regression with the adjusted R2 statistic provided for both the regression which is the subject of Dr. Sen's evidence and the alternate regression requested and the F statistic for the alternate regression requested. If not, please explain why not and please run an alternate regression using the same data but omitting the regressor that is the coefficient of b2 and provide the requested statistical output.

e) Did the regression methodology used implicitly assume (i) that industrial loads can shift demand from the second 12-hour period in a given 24-hour period to the first 12-hour period in the same 24-hour period, i.e., assuming discrete, non-overlapping 24-hour periods or (ii) did it take into account that load could be shifted from the second 12-hour period in the current 24-hour period to the first 12-hour period of the next 24-hour period? That is, was the lagged specification applied to each 12-hour period successively, or only for every second 12-hour period (once per 24-hour period)?

f) Did Dr. Sen undertake any specification tests on the regression equation estimated? If so, please provide. If not, why not?

g) Does Dr. Sen agree that firms must make decisions to shift load and reschedule labour from one period to another before the actual electricity prices re known?


## Question #3

**Reference:**                    Page 3, paragraph 12

a) Please explain why the existence of frequent price spikes is relevant when the empirical specification of the model involves average demand and prices over the entire 12 hours of the peak period.

b) The analysis was done for two separate years (i.e., 2006 and 2007) using the months of May, June, July and August. Please explain how this gave rise to 244 observations for each year (per Table 1)?


## Question #4

**Reference:**                    Page 4, Table 1

a) Please provide the output of the statistical software program that was produced in running the regressions summarized in Table 1. If not included in the statistical output, please provide the F statistics and Durbin-Watson statistics for each.

b) Table 1 appears to indicate that in 2007, the demand curve for electricity as an input in the Motor and Petrol sectors was upwards sloping as evidenced by the positive parameter estimates associated with the current HOEP. Please confirm that in microeconomic production theory, no input demand curves can ever be upward sloping (whether they be normal or inferior inputs).

c) Please indicate whether there was any correlation between HOEP averaged over a 12-hour period and HOEP averaged over the next period. If so, please indicate how this affected the estimation exercise and how the effects were mitigated.

**Question #5**

**Reference:**          Page 4, paragraph 15

   a)  Please provide a precise statistical definition as to what is meant by the expression "the coefficient estimate of an explanatory variable is significant at the 1% level" as used in paragraph 16 and also please indicate how this statement should be interpreted by the layperson and the assumptions under which such confidence statements hold true.


**Question #6**

**Reference:**          Page 5, paragraphs 16-18

   a)  Please confirm that (per paragraph 16) the model estimates suggest that a 10% increase in the <u>average</u> price over a given period will lead to a 2.3-2.6% decrease in <u>average</u> use by the pulp and paper industry during the same period.

## B. "**THE BENEFITS OF IMPROVEMENTS IN TRANSMISSION RATE DESIGN**", PREPARED BY AMPCO

### Question #7

**Reference:**          Page 2, lines 25-28

a) The first sentence in the paragraph suggests that the government's focus is on reducing system peak demand.  While the second sentence suggests the focus is on demand during the peak periods.  Please clarify what AMPCO's understanding of the government's policy focus is and whether "peak periods" involves more than just the time of the system peak.  Please provide relevant references.

### Question #8

**Reference:**          Page 3, lines 2-5

a) This paragraph sets out two objectives for transmission rate design.  In AMPCO's view are there any other objectives/criteria that should be taken into account when designing transmission rates?  If yes, please outline what they are.

### Question #9

**Reference:**          Page 3

a) With respect to line 9, please clarify what AMPCO means by "during monthly system peaks", e.g., is this meant to refer to the one-hour monthly system peak?

b) With respect to line 14, please clarify what AMPCO means by "periods of peak demand", i.e., specifically what hours or periods of the year are being referred to?

c) With respect to lines 12-16, does AMPCO agree that for customers whose monthly coincident peak demand exceeds 85% of their non-coincident (peak period) demand, the current rate design for the Networks Charge provides an incentive for them to reduce their coincident peak demand?  If not, why not?

d) With respect to lines 16-18, is it AMPCO's contention that all investment in Transmission Network assets is driven solely by system peak demand.  If not, what other drivers are there for Network assets and how does AMPCO's proposed rate design reflect these cost drivers?

e) With respect to lines 22-27, during the last Hydro One Networks' Transmission Rate Proceeding (EB-2006-0501), AMPCO's witness (Mr. Saleba) put forward a

number of tests FERC used to establish which months of the year should be included when determining cost causation and concluded (Exhibit J/Tab 13/Schedule 9 and Transcript Volume 10, page 89) that these tests supported the inclusion of all 12 months in Hydro One Networks' transmission rate design.

- Has AMPCO updated these calculations based on more recent data?
- If yes, please provide the results.

## Question #10

**Reference:**          Pages 4-5

a) With respect to Table 1, please confirm if Hour #1 is Midnight to 1:00 am.

b) Please provide a table similar to Table 1 but based on 2006 data.

c) Does the analysis set out in Table 1 cover all industrial consumption or just that associated with five industrial sectors analyzed by Dr. Anindya Sen?

d) Please provide a schedule similar to Table 1 for each of the five sectors analyzed by Dr. Sen.

e) Has AMPCO or Dr. Sen undertaken any statistical analysis to determine whether average industrial demand in the peak hours (i.e., weekdays 7 am to 7 pm) is significantly different from average demand in the off-peak hours? If yes, please provide.

## Question #11

**Reference:**          Page 6

a) With respect to lines 8-20, please confirm that:
- References to changes in price are with respect to the average price over the 12 hour peak period or 4 hour off-peak period. If not, please explain why.
- References to changes in demand are with respect to the average demand in the 12 hour peak period and the average demand in the 4 hour off-peak period. If not, why not.

**Question #12**

**Reference:**        Page 7

  a) Please indicate which Ontario industrial consumers (and sectors) have operations in jurisdictions with transmission rate designs similar to that proposed by AMPCO.

  b) Please indicate the jurisdictions and provide copies of their transmission tariff sheets.

  c) Please provide any documentation or analyses that would verify the suggestion that 3-5 production curtailments for periods of 2-4 hours ensures that consumption is reduced during the actual hours of a system peak.

  d) Please confirm whether each of the production curtailments typically occurs on a different day.

  e) Has AMPCO compared the load profiles in these jurisdictions with those of Ontario to determine whether the load profiles on system peak days are similar?
   - If yes, please provide the analysis.
   - If no, on what basis is it reasonable to conclude that 3-5 production curtailments for periods of 2-4 hours would ensure that consumption is reduced during the actual hour of the Ontario system peak?


**Question #13**

**Reference**:        Page 8

  a) Why is it reasonable to assume that if it takes 20 hour of curtailment to avoid the system peak, it will take 100 hours of curtailment to avoid the 5 days with the highest peaks? As the number of days to be included increases, doesn't the uncertainty as to which days will be captured by the highest 5 also increase?

  b) Table 3 calculates a value of $308/MWh for transmission cost savings from demand response in the 100 curtailed hours. Assuming each reduction occurs on a different day (i.e. 25 days at 4 hours each), please confirm that the impact of the transmission cost savings would translate into an <u>average</u> cost reduction of $30.84 / hour over a 12 hour peak period (i.e., $30,840 / (25 periods * 12 hours / period)). If not confirmed, what is AMPCO's estimate of the average cost saving (i.e., shadow price) over the 12 hour peak period associated with avoiding the transmission network charge.

c) Please provide the <u>current</u> shadow price for transmission for those customers whose demand at system peak exceeds 85% of their non-coincident (peak period) demand. Please provide the supporting calculations and assumptions.

d) Please provide the <u>current</u> shadow price for transmission for those customers where 85% of non-coincident demand exceeds their coincident peak demand. Please provide the supporting calculations and assumptions.


**Question #14**

**Reference:** Page 9

a) The first paragraph suggests that this section is estimating the amount of industrial demand response to a change in transmission prices. However, the table appears to report the impact average demand has on average price. Please reconcile.

b) Please reconcile the use of the months June through September for this analysis with the fact Dr. Sen's analysis (page 3) was based on the months May to August.

c) Table 4 purports to set out the "effect of average demand on average HOEP for 2007 during the on-peak hours and during off-peak hours". Please explain fully (with supporting calculations and schedules):
   - What the $0.012 / MWh and $0.010 / MWh values are meant to represent.
   - How the $0.012 / MWh and $0.010 / MWh values were calculated.

d) Please explain why it is appropriate and how Dr. Sen's analysis – which estimates the impact of changes in average price on average demand in a period – can be used to determine the impact of demand on price as suggested in Table #4.

e) With respect to Table #4, please clarify what the min/mean/max summer demand values for each industrial sector represent. For example, are they the one-hour minimum, mean and maximum values over the entire summer period?

f) For each industrial sector, please provide the minimum, mean and maximum average 12 hour peak period demands during the summer months for 2007.

g) Please re-do Table #4 using a transmission shadow price of $30.84 / MWh.

## Question #15

**Reference:**        Page 10

a) Using the results for the Pulp and Paper sector, please provide the supporting calculations that show how each of the following values was determined:
- The reported 204% change in demand in response to a change in price
- The reported 175 MW absolute change in demand during the peak periods
- The reported 6 MW demand response as average of summer hours
- The reported $0.07/MWh effect of demand response on HOEP

b) Please explain why a demand reduction was attributed to the Motor sector when the elasticity estimate is "positive", which would suggest a demand increase.

c) Please re-do Table 5 with the following changes:
- Use a transmission shadow price of $30.84 / MWh
- Correct the impacts to recognize that the elasticity estimate for the motor sector is positive.

d) Please confirm that the results set out in Table 5 assume the current transmission shadow price is zero. If this is not the case, please explain why.


## Question #16

**Reference:**        Page 11

a) Using the results for the Pulp and Paper sector, please provide the supporting calculations that show how each of the following values was determined:
- The reported 87% change in demand in response to a change in price
- The reported 129 MW absolute change in demand during the peak periods
- The reported 4 MW demand response as average of summer hours
- The reported $0.04/MWh effect of demand response on HOEP

b) Please confirm that the results set out in Table 6 assume the current transmission shadow price is zero. If this is not the case, please explain why.

**Question #17**

**Reference:**      Page 12

a) Please confirm if the reference to "days of the five highest peaks in Ontario" – means the average of the customer's coincident peak demand on the 5 days with the highest Ontario peaks. If not, what is the intended billing determinant?

b) What is AMPCO's rationale for using the highest 5 days?

c) Please provide a Table that sets out the peak demands in 2007 for the 50 days with the highest Ontario peaks; the day and hour each occurred and what each day's peak is as a percentage of the overall system peak value for 2007.

d) With respect to lines 22-24, how would AMPCO's proposal work in the future if Hydro One Networks requested a two-year rate order?


**Question #18**

**Reference:**      Page 13

a) For those industrial customers whose Network Charges are based on 85% of their non-coincident peak demand (in the peak period), please confirm that the current rate design will encourage such customers to:
- Reduce their non-coincident peak demand (in the peak period) through shifting load either within the peak period or to the off peak period
- Manage their coincident peak demand so that it continues to be below 85% of their non-coincident peak demand

If not confirmed, please explain why not.


**Question #19**

**Reference:**      Page 13, lines 18-28

a) Is it AMPCO's view that under its proposed rate design both working capital allowances and allowed ROE values could be reduced?

b) If the response to part (a) is yes, please provide AMPCO's estimate as to the reduction that could made in each case?

c) Under the AMPCO proposal transmission charges to industrial customers will be based on loads in the previous year. To the extent loads vary from year to year due to economic conditions and overall production levels, this means that there will be a disconnect between a industrial users transmission charge and the level

of production in the same year. Does AMPCO or its members have any concerns regarding the impact this disconnect could have on the customers' reported financial results in a given year? (For example, if a high production year was followed by a low production year, the transmission charges in the second year would be reflect the higher production levels and deflate the reported earnings in the second year)

**Question #20**

**Reference:**          Pages 14-16

a)  With respect to Table #7, please provide a schedule that indicates for each year (2003 -2008) the number of hours the Ontario demand was higher than the peak on the 5th highest day.

b)  Please confirm that, under the AMPCO proposal, a customer has no incentive to manage its load (from a transmission pricing perspective) over the balance of the day once it knows the peak demand for the day has passed. If not confirmed, please explain why.

c)  If the objective is simply to avoid the system peak, then can a customer avoid the transmission price simply by shifting load to an hour in the peak period when the system peak will not occur?

d)  The strategies outlined on pages 14-15 would appear to work best when the customer can react (and change demand) in real time (i.e., in response to the observed demand on day in question).
    - How many of the industrial customers in the five sectors analyzed are dispatchable loads and therefore have demonstrated such a capability?
    - What percentage of the total load in each sector is "dispatchable"?

e)  Has AMPCO reviewed accuracy of the IESO's day ahead load forecasts to determine the extent to which they can be used to identify system peak days and what level of confidence can be attached to such forecasts?

f)  Would relying on the day ahead load forecast increase the number days (and/or hours) over which load curtailment would have to occur in order to reduce demand during the 5 "peak days"? If not, please explain why not.

**Question #21**

**Reference:**   Pages 16-17

 a) With respect to page 17 (lines 6-8), the projects set out in Tables 4 & 5 (Exhibit D1/Tab 3/Schedule 3) appear to be customer and generator connection projects. Is it AMPCO's contention that the cost of these projects will be recovered through the Transmission Network Charge?