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VIA MAIL and E-MAIL

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

Dear Ms. Walli:

**Re: "Top Down" Estimation of DSM Program Impacts on Natural Gas Usage
report by PEG
Board File Number: EB-2008-0346
Submissions of the Vulnerable Energy Consumers Coalition (VECC)**

As per the Board's letters of March 19, 2010 and May 5, 2010, please find attached VECC's submissions on the report referenced above.

Yours truly,

Michael Buonaguro
Counsel for VECC

PEG Report: “Top Down” Estimation of DSM Program Impacts on Natural Gas Submissions of the Vulnerable Energy Consumers Coalition (VECC)

PEG investigated three approaches in its efforts to determine whether a “top down” approach to estimating gas savings resulting from DSM efforts would be feasible for Enbridge Gas Distribution (EGD) and Union Gas Limited.

First Approach

The first approach involved a two-stage exercise.

In the first stage, monthly volume data, the regressand, was regressed on monthly price data and heating degree days (HDDs) by class. The actual monthly prices and HDD values were then plugged into the estimated regression equation to determine normalized monthly volumes. These monthly volumes were then aggregated in normalized annual consumption volumes.

The results of this first stage regression resulted in estimated coefficients that were statistically significant and whose signs that were consistent with economic theory.

In the second stage, the percentage difference between actual and normalized annual consumption was regressed on DSM spending and other regressors with the estimated DSM coefficient providing a top-down estimate of gas savings. Unfortunately, however, in this second stage exercise, “PEG was never able to identify a statistically significant relationship between changes in residential gas consumption and DSM spending in the previous year.”¹

VECC notes that there may well be variable lags between the spending on a particular DSM program, full implementation of the program, and realized DSM savings. Furthermore, for this first approach to work, the data required likely needs to be more granular than the data available, e.g., indicating by class which customers are DSM participants and matching DSM spending with DSM savings for these customers, spending by class, etc.

VECC also submits that in the first stage of this exercise, it might be appropriate to use either (i) a qualitative variable to indicate whether a particular month is a heating season or not or (ii) estimate a regression equation that does not assume that the HDD coefficient is the same in each month. However, there is no certainty that such revised approaches would provide a more useful second-stage result, given the quality of the data available.

¹ PEG Report, page 46

More generally, in VECC's view, there is no reason to assume that each dollar of spending provides either the same "bang for the buck"² or to assume that the lag between spending and realized savings is the same for different programs.³ But, to address this issue, markedly greater data granularity is required than is currently available. As such, refining this approach will not likely result in more robust results at least for the short and medium term as it would take much more time and effort to collect the requisite data for a reasonable sample size.⁴

In VECC's view, the results so far do not appear to justify pursuing this approach.⁵

Second Approach

PEG started with the utilities' gas demand models used for short-term forecasting and added DSM as a regressor to variants of these models. PEG also used an estimation procedure that corrected for autoregressive conditional heteroscedasticity (ARCH) and serial correlation.⁶ The results of this approach are described by PEG as follows:

"The econometric results for Union's five revenue classes are presented in Tables 14 through 18. In all cases, the coefficient on price is negative and statistically significant and, in nearly every instance, the coefficient on Union's monthly HDD variable is positive and significant. The EcoEnergy variable is not significant in either of the two residential revenue class regressions. Two variables also have an unexpected sign and are statistically significant: number of people per household (for M2 residential customers), and the segmentation index (for commercial revenue class 10). The coefficient on DSM is negative and statistically significant on both of the residential revenue classes and for one of the three commercial revenue classes (Commercial 01 customers). These DSM coefficients are -0.077 for the 01 Residential Class, -0.056 for the M2 Residential Class, and -0.034 for 01 Commercial Customers. These values indicate that a 1% increase in DSM expenditures will be associated with contemporaneous declines in gas consumption of 0.077% for Residential 01 customers, 0.056% for Residential M2 customers, and 0.034% for Commercial 01 customers."⁷

² For the same program targeted to the same class, this could be due to diminishing marginal returns; for different programs targeted to different classes there is no a priori reason to assume equal effectiveness.

³ Both utilities and PEG take the view that the monthly DSM spending data is not reliable (pages 5 and 6 of the PEG Report.) The PEG Report discusses the issues involved in using monthly data as opposed to annual data on pages 25 and 26, and utilized the two-stage approach to address these issues.

⁴ Going forward, if the data collection started today, one year hence we will only have one year of more granular data.

⁵ If the data could be collected at a cost that is not material, there might be a rationale for continuing to pursue this approach. However, VECC suspects that the costs of collecting this data may be material. Further, there is no certainty that the benefits of continuing with this approach will equal or exceed the costs.

⁶ Not correcting for these would result in inefficient coefficient estimates and biased standard errors of the coefficients. While VECC notes that an omitted variable can also be the true cause of suspected autocorrelation and heteroscedasticity, VECC has no view as to whether there is an omitted variable problem here.

⁷ PEG Report, page 48. VECC notes that the functional forms estimated provide constant elasticity estimates. Due to the previously mentioned possibility of decreasing returns to scale within a given program and the fact that not all

VECC notes that while this approach appears more promising than the first, PEG continues with this caveat:

“Again, these results must be interpreted cautiously in light of the problems with the monthly DSM expenditure data. However, they do provide some indicative evidence on the impact of DSM spending on changes in gas consumption for several revenue classes for EGD and Union Gas. This information could potentially be used as supplementary, or supporting, evidence in DSM proceedings in Ontario, but it is certainly not definitive enough to substitute for the bottom-up approach that is currently used in the Province.”⁸

VECC agrees with PEG’s conclusion in respect of this approach.

Third Approach

PEG constructed gas demand models – all without a DSM spending regressor – for eight revenue classes. PEG then estimated annual gas consumption for each class along with 95% confidence intervals for each class. PEG then compared predicted consumption with actual consumption. The rationale and results of this approach, along with PEG’s conclusion, are described by PEG as follows:

“If actual gas consumption was below the predicted value, and outside the confidence interval, this could provide more indirect evidence of the impact of DSM spending on gas consumption.

PEG investigated dozens of such models, and none of them identified a year in which actual gas usage was below the predicted value and outside of the confidence intervals. Thus, this approach did not identify any negative and statistically significant differences between actual and predicted gas consumption. Like the main approach detailed on Tables One through Ten, this secondary approach therefore does not provide “top down” evidence that can be used to substitute for the bottom-up methods currently used in Ontario’s gas DSM programs. Because the econometric results from the secondary approach add little or nothing of value to Tables One through Ten, they are not presented in this report.”⁹

VECC agrees with PEG’s assessment of the results of this approach.

programs would be expected to provide the same savings and hence consumption reductions, the implicit assumption of constant elasticities may not be warranted.

⁸ PEG Report, page 57

⁹ Ibid

Conclusions

VECC agrees with PEG's conclusion that,

"PEG's analysis could likely be improved if better data were available. One improvement would be more accurate data on DSM spending by revenue class and (for EGD) geographic zone. It could also be helpful to have information on when (in a given year) particular DSM measures were installed, in addition to having more accurate data on DSM spending.

More appropriate estimates of DSM savings could also be developed if demand models are estimated separately for participating and non-participating customers. A relatively small share of customers in a revenue class is likely to be participating in utility DSM programs in any given year. The behavioral characteristics of participating and non-participating customers may be so different that they effectively constitute different populations with, accordingly, different underlying demands for natural gas. However, developing detailed customer-specific data would likely entail significant costs, and it would take years for enough sample data to be available to facilitate statistical analysis. There is also no guarantee that this approach will be successful and yield statistically significant and robust results."¹⁰

In VECC's view, the current "bottom up" approach used to estimate DSM savings is preferable to the alternative of investing significant resources to collect the required data and to search for a workable "top down" model whose benefits will outweigh its costs.

¹⁰ PEG Report, page 59