Ontario Energy Board

EB-2010-0364

Staff Report to the Board

Review of the Structure and Price Setting Methodology for Time-of-Use Prices

March 25, 2011

Introduction

Ontario currently has 1.9 million consumers purchasing electricity under the Board's Regulated Price Plan ("RPP") that are being billed on the basis of time-of-use ("TOU") prices. By the summer of 2011, it is expected that over 3 million consumers will be on TOU pricing under the RPP; by 2012, all RPP consumers with smart meters will be on TOU billing.

On October 18, 2010, the Board initiated a consultation on the price setting methodology and structure of TOU prices under the RPP. This initiative to review RPP prices, and in particular TOU pricing, was identified as part of the Board's 2010-2013 Business Plan issued in April 2010, and is intended to ensure that the design of TOU prices is fair and meets the objective of ultimately reducing overall power system costs.

The Board engaged an expert consultant, The Brattle Group, to prepare an analysis of the current TOU regime and of the impact of alternative options that could be considered by the Board going forward. This analysis was a central focus of the consultation with stakeholders.

The first stage of the consultation was a stakeholder meeting that focused on issues identified by Board staff and a report and analysis prepared by The Battle Group. Stakeholders were then invited to file written comments on that report and analysis, the issues identified by Board staff and any other issues they wished to raise.

Thirty-five stakeholders participated in the stakeholder meeting, and nineteen filed written comments. Participating stakeholders are listed in Appendix A, and their written comments are available on the Board's website on the project webpage.[1]

This Staff Report provides an overview of the analysis prepared by The Brattle Group, and summarizes the issues in this consultation and stakeholders' views on the issues as expressed at the stakeholder meeting and in written comments. This Report also sets out Board staff's recommendations in relation to the subject-matter of the consultation.

Overview of the Brattle Report and Analysis

The Board commissioned a review of the current TOU structure and price setting methodology by The Brattle Group ("Brattle"). The results of this review are set out in The Brattle Group's report entitled *"Assessing Ontario's Regulated Price Plan: A White Paper"* (the "Brattle Report").[2]

[1] http://www.ontarioenergyboard.ca/OEB/Industry/Regulatory+Proceedings/Policy+Initiatives+and+Consultations/Regulated+Price+Plan/2010-11+Time-of-Use+Consultation+(EB-2010-0364)

[2] Available on the Board's website on the project webpage.

The Brattle Report compares Ontario's current TOU regime with TOU rates and price structures in other jurisdictions, primarily in the United States. This comparison was used to develop a list of comparators to enable an evaluation of Ontario's regime against industry "best practice" in other jurisdictions, and to identify alternative options that could be considered for Ontario. The following table shows the results of this benchmarking exercise and Brattle's assessment of how Ontario's current TOU structure compares with practice in other TOU regimes.

Results of TOU Benchmarking

TOU Characteristic	Alignment with Best Practices?	Reason
Number of periods	Strong	Many TOU rates have three periods
Timing/duration of peak	Strong	Aligns well with historical system load and hourly energy market prices
Seasonality	Strong	Dual peak in winter justifies seasonal change in pricing structure
Time-varying charges	Strong	Typically only generation-related charges are made to be time-varying
Average customer cost neutrality	Moderate	Calculation is reasonable given available data; focus on province-wide supply cost recovery can have differential impacts on customers
Price ratio	Weak	Price ratio is low relative to TOU programs in other jurisdictions; likely to produce modest customer response or bill savings

Source: The Brattle Report, page 3.

Although the Brattle Report identifies some minor areas where improvements could potentially be made, Brattle's analysis shows that much of Ontario's current TOU price structure and price setting methodology is consistent with best practice elsewhere. For example, three-period pricing structures are quite common in other jurisdictions. Moreover, Ontario's peak period is sufficiently short to allow consumers to shift consumption to lower-priced periods.

Brattle also found that Ontario's price structure closely conforms to Ontario's system load curves and market price trends. In addition, different seasonal price structures are justified because of Ontario's winter double demand peak. The *prima facie* conclusion is that Ontario's TOU pricing structure and price setting methodology are well suited to the goals of fair energy pricing and reduced overall power system costs.

However, Brattle did note that the one area where Ontario's TOU regime differs the most significantly from practices in other jurisdictions is in its peak-to-off-peak price ratio. The average ratio identified by Brattle is 4-to-1 (with a mean of 3.8), whereas the

Ontario ratio is 1.9 to 1. The Brattle Report identified alternative options that could be considered to address Ontario's relatively narrow ratio, as shown in the table below:

Options for Addressing the Price Ratio

Rate Design Option	In Existing TOU…	Alternative option…	Likely Impact on Price Ratio
Renewables Cost Reallocation	Existing GA costs only, allocated uniformly across periods	Allocate wind & solar to peak period, account for expected FIT costs	Increases peak costs, decreases off-peak costs, and increases price ratio
Peak Duration	6 hour peak, 8 hour mid-peak (opposite in non-summer months)	Shorten peak and mid-peak period to 4 hours in both seasons	Shorter peak period spreads capacity costs over fewer peak hours, increasing the peak price
Seasonality	Year-round	Summer-only TOU with off-peak rate applying during the winter months	Summer-only means fewer peak hours and therefore higher peak price
Price setting methodology	Set off-peak and mid-peak price, solve for peak price	Set peak and mid-peak price, solve for off-peak price	Changes in the supply cost structure could increase or decrease the price ratio under this approach
Number of periods	Three periods (peak, mid-peak, and off-peak)	Remove mid-peak period to create 2 period rate	Depends on how prices are set; combined with other rate design approaches, smaller number of periods could be beneficial

Source: The Brattle Report, page 5

Brattle used these alternative options to construct four illustrative TOU "rate options", which formed the basis of consumer response and consumer bill impact simulations. Consumer bill impacts were derived using data from five distributors.[3]

The Brattle Report and Brattle's presentation at the stakeholder meeting focused on a detailed analysis of one of the TOU rate options; Alternative Rate #3. This rate option comprises the following modifications to the existing TOU regime: the addition and reallocation of expected wind and solar Global Adjustment ("GA") costs to the peak period; the peak and mid-peak periods each reduced to four hours; and TOU pricing being applied only in the summer months, with a flat rate applying for the balance of the year. This alternative has a peak to off-peak price ratio of 4.9 to 1, and is the one that produced the highest simulated consumer response (4.4% decrease in peak demand) and system capacity reduction (1064 MW) of the four alternative rate options.[4] Across consumer samples from all five distributors, the simulated incremental impact on the commodity portion of the bills ranged from -12% to +18%, prior to accounting for consumer response.[5] As a percentage of the total bill, the impacts would be largely half those percentages.

[3] Toronto Hydro, Thunder Bay Hydro, Newmarket-Tay Hydro, PowerStream and Milton Hydro.
[4] The range of peak demand reductions over the four rate options was 0.2% to 4.4%, and peak capacity reductions ranged from 61 MW to 1064 MW.
[5] Estimated elasticities were used to evaluate consumer responses. The elasticity estimates were derived from data collected from other jurisdictions given that Ontario data and consumer experience were considered insufficient to derive robust estimates. The uniform impact of elasticity estimates was to increase the number of consumers who would experience total bill decreases and increased individual bill savings.

Issues Identified by Board Staff

Attached to the Board's December 6, 2010 letter setting out details of the stakeholder meeting was a list of issues prepared by Board staff to stimulate discussion about the current TOU regime and options that could be considered as alternatives to the current TOU pricing structure or price setting methodology. These issues were organized into two broad categories: (i) "structural issues", relating to matters associated with the establishment of TOU pricing periods, including critical peak pricing; and (ii) "price setting methodology issues", relating to matters such as cost recovery, the allocation of costs through the different pricing periods and target ratios. For convenience of reference, the list of issues is reproduced as Appendix B to this Report.

Summary of Stakeholder Input

As noted above, thirty-five stakeholders participated in the stakeholder meeting, and nineteen[6] filed written comments. These stakeholders included private citizens, distributors, retailers, representatives of ratepayers and the Independent Electricity System Operator (the "IESO"). Some of the written comments focused principally on the Brattle Report and analysis, others on the issues identified by Board staff, and yet others were a combination of the two.

This section of the Report provides an overview of the input received from stakeholders during this consultation.

An overwhelming majority of stakeholders expressed the view that it is premature for the Board to make any changes to the TOU pricing regime at this time. The principal reason given for deferring consideration of any changes to a later date is the relative absence of robust and reliable Ontario-based data to serve as an empirical basis on which to assess either the need for or the impact of any modifications to the current TOU regime. Some of these comments were specific to implications for low-income consumers, others for consumers that are not eligible for the RPP and others for RPP consumers or consumers more generally.

A number of stakeholders also noted the usefulness of engaging in province-wide pilot projects to test the effectiveness of alternative options prior to making any material changes. Some stakeholders also cautioned that consumers will have limited tolerance for frequent structural changes to their commodity pricing regime. It was noted that one structural change is already set to be implemented effective May 1 of this year; namely, the change in the commencement of the off-peak period to no later than 7 p.m. on weekdays as required by an amendment to Ontario Regulation 95/05 (Classes of Consumers and Determination of Rates).

[6] Two distributors made a joint filing.

Although few participants recommended that any change to the TOU pricing structure be made now, a number of participants did comment on the merits of the current versus alternative approaches.

A number of stakeholders were supportive of retaining the current pricing structure. Some stakeholders observed that the three-period structure closely correlates with RPP supply costs. Some stakeholders suggested that two price periods might be easier for consumers to understand and/or could enhance price ratios. There was also some support for the implementation of critical peak pricing, particularly in the summer season. Certain stakeholders observed that the inclusion of the spring and fall shoulder seasons in the seasonal price calculations "smooths" the peak price calculation. One participant suggested that this could be addressed by having a quarterly pricing structure, while another suggested a monthly pricing structure.

Retailers and the IESO were generally supportive of a TOU structure that reflects market pricing, with greater reliance being placed on market forces in determining commodity prices. Another stakeholder supported TOU rates in the summer and a flat rate for the remainder of the year.

One stakeholder advocated for the introduction of lifeline rates or rebates for low-income households and non-profit housing providers. One stakeholder made a late filing that proposed substantial structural changes to the current TOU regime. This proposal included setting individual baseline consumption levels to be billed at off-peak prices for smart-metered consumers and then charging incremental mid-peak and peak prices based on individual load curves. One ratepayer, who had collected consumption data for an extended period and was able to separate his heating load from his total load, argued in favour of a special winter rate for consumers with electrically heated homes.

The principles of supply cost recovery and cost causality received very strong support from stakeholders. This was particularly the case for representatives of consumers, but also for other participants. Although many of these comments acknowledged the importance of adequate price differentials to encourage load shifting behaviour, it was argued that this should not be at the expense of compromising the principles of cost recovery or cost causality. By contrast, support for price ratios that are developed on a basis other than supply curve characteristics was almost non-existent. Some stakeholders noted that anticipated changes in Ontario's future supply mix may contribute to an increase in the price ratio as higher cost generation (e.g., solar generation) comes into service.

Stakeholders that commented on the issue were also supportive of the current methodology for allocating GA costs. Some noted the possibility that the methodology could result in greater price ratios, but almost all advocated that the central focus should be on fair cost allocation and fair cost recovery. Increased price ratios were generally seen by stakeholders as secondary, and not a primary objective of the GA allocation methodology. One stakeholder did, however, support using the GA allocation to increase price ratios.

Retailers supported a change in the allocation of the variance account. One suggested that it be used to mitigate bill impacts, and another to enhance peak pricing. Another stakeholder favoured an allocation of the variance account similar to the GA allocation.

The TOU rate option developed by Brattle as one means of addressing the peak-to-off-peak price ratio issue discussed above did not generally receive support from stakeholders, and was rejected by most as inappropriate for Ontario, at least at this time. Of the stakeholders that commented on the option, many noted that the current dispatch data for wind generation does not support the cost allocation (to the peak period only) underlying the rate option. A number of participants also observed that this approach would be inconsistent with the methodology for allocating GA costs that was adopted by the Board in 2008 (EB-2007-0672). Some stakeholders suggested that an analysis to determine the breakdown of generation costs into capacity and variable cost components should be required before further considering this type of allocation.

Board Staff Observations

The current TOU pricing regime was developed in 2004-05 after extensive consultation with stakeholders. The Board engaged an expert consultant to assist in developing the TOU structure and price setting methodology, and struck a working group comprised of industry and ratepayer representatives to make recommendations to the Board. The current TOU regime was developed based on the best information that was available at that time from experience in other jurisdictions, as well as on Ontario market price and load data.

As noted above, the Brattle Report confirms that: (i) the current three-price period is consistent with industry "best practice";[7] (ii) the TOU price structure is congruent with Ontario's current load and market price patterns; and (iii) the seasonal price structure closely tracks system costs and market prices. Board staff notes that there appears to be no significant divergence in Ontario's current total load profile from the trends observed when RPP prices were first established by the Board in 2005.

Prior to widespread implementation of TOU pricing, the Board implemented a TOU pricing pilot with the cooperation and support of Hydro Ottawa (the "Ontario Smart Price Pilot").[8] This pilot project tested consumer responses to both the current TOU structure and some variations on it (critical peak prices and rebates). Data from this pilot project confirmed that consumers respond as expected to TOU pricing by shifting consumption away from peak price periods, and that there are additional benefits in terms of total load reductions resulting from a general conservation response.

[7] One stakeholder expressed the view that use of the term "best practice" is misleading in this context because it really means average or acceptable practice.
[8] The Ontario Smart Price Pilot operated from August 2006 to February 2007. Documents and reports from this pilot project are available on the Board's website, as are materials relating to Board-approved TOU pilot projects conducted by other distributors.

As well, a survey of pilot project participants confirmed that they found the three-part pricing easy to understand and respond to. While a three-period structure might be considered by some to be too complex for consumers to readily understand, staff notes that experience to date in Ontario indicates that consumers understand and can respond to a three-period structure.[9]

Supply cost recovery has been a central principle of the Board's RPP regime since its inception in 2005. Legislation governing the manner in which the Board sets RPP prices currently enshrines supply cost recovery as an element of the price-setting exercise. Specifically, paragraph 3 of section 6(1) of Ontario Regulation 95/05 requires the Board to forecast the cost of electricity to be consumed by RPP consumers and to ensure that RPP prices reflect those costs. In addition, section 79.16 of the *Ontario Energy Board Act, 1998* (under which the Board sets RPP prices) requires that the Board make adjustments to RPP prices with a view to eliminating variance account balances within 12 months or such shorter time as the Minister may direct.

Staff believes that the Board does retain some flexibility in terms of assigning and recovering supply costs as considered appropriate to achieve specific objectives of TOU pricing. In 2008, the Board modified its approach to the allocation and recovery of forecast GA costs to address the issue of "price convergence" (the systematic narrowing of TOU price ratios over time). The Board could make adjustments to the manner in which RPP supply costs are allocated and recovered if considered appropriate, for example to address the peak-to-off-peak price ratio issue discussed in the Brattle Report. As indicated earlier, this is the area that Brattle identified as constituting the most significant departure from industry "best practice" in other jurisdictions, and could be addressed by "selective supply cost allocation" where supply costs are allocated to increase the peak price and decrease the off-peak price.

Staff notes the overwhelming stakeholder support for retaining the current price setting methodology, in particular in relation to supply cost recovery and cost causality. While Ontario's peak-to-off peak price ratio may not be in line with "best practice" elsewhere, staff suggests that Ontario data and experience to date have not revealed a clear need to widen the price ratios at this time.

Conclusion and Recommendations

There was considerable consensus among participants in this consultation on a number of basic issues. Board staff notes that this consensus relates to both the Brattle analysis and the issues identified by staff to stimulate discussion.

[9] This observation is based on surveys or analyses undertaken by, or information available from, distributors in relation to those of their consumers that are on TOU pricing. This includes the results arising out of the Ontario Smart Price Pilot. Newmarket-Tay Hydro undertook similar surveys of their ratepayers, and Milton Hydro has supplied anecdotal evidence to the effect that consumers understand and readily respond to the three-price structure.

The common themes that emerged from this consultation can be summarized as follows:

- Supply cost recovery and cost causality remain important principles in setting TOU prices.

- More experience with the current TOU regime and more Ontario data are required to enable a rigorous assessment of the current regime.

- With more data, the Board and other interested parties will be in a better position to evaluate both the current TOU regime as well as the costs and benefits of any alternative pricing structure(s) or price setting methodology(ies) that might be considered for future implementation.

Board staff suggests that the results of this consultation demonstrate that there is no compelling rationale or support for a change in the structure of TOU prices at the present time.

Notwithstanding the data and analysis that is available from Ontario-based TOU pilot projects, there is only limited data available now from ratepayers that are being billed on the basis of TOU prices. The data that is currently available covers a relatively short period of time and a relatively small number of consumers.[10] Board staff believes that the Board will be in a better position to assess the current TOU pricing regime and its effectiveness in reducing overall power system costs, as well as the implications of potential changes to that regime, once additional data becomes available. In staff's view, a database comprised of at least two years of consistent data should be constructed to serve as an empirical basis for further consideration of the need for and form of alternative approaches.

Staff also suggests that pilot projects could prove useful as a means of assessing the implications and costs associated with alternative approaches that might be considered for future implementation.

Having regard to the above and the results of the Brattle analysis, Board staff makes the following recommendations for the Board's consideration:

1. The current TOU pricing structure, with the necessary adjustment in TOU periods to reflect the changes in Regulation 95/05[11], and price setting methodology should remain in place until more data has been collected to allow for a more robust analysis of the current regime and of potential alternative approaches.

2. A TOU data collection and monitoring project should be initiated to track relevant TOU and other data series from a select group of distributors. The objective of this project should be the development of a TOU database of sufficient size and

[10] Milton Hydro, the distributor with the longest experience with TOU pricing, began applying TOU prices in 2005.
[11] Effective May 1, 2011, off-peak hours for weekdays will be 7 p.m. to 7 a.m.

quality to support an analysis of alternative TOU price structures and price setting methodologies. This database development project should have a data collection horizon of a minimum of two years, which will also provide an empirical basis for the further assessment of the current TOU structure.

At the same time, Board staff will continue to monitor the implementation of TOU pricing with a view to gauging whether short-term consumer responses are consistent with expectations. This monitoring can, among other things, assist the Board in evaluating whether pilot projects might usefully be undertaken to test alternative TOU pricing structures or price setting methodologies.

Appendix A

Consultation Participants

The following stakeholders participated in the stakeholder meeting:

Ratepayer/Consumer Representatives

- Federation of Ontario Cottagers' Associations Inc.
- Ontario Non-Profit Housing Association
- Vulnerable Energy Consumers Coalition
- Consumers Council of Canada
- School Energy Coalition
- Advocacy Centre for Tenants Ontario
- Co-Operative Housing Federation of Canada

Electricity Distributors

- Toronto Hydro-Electric System Ltd.
- Hydro One Networks Inc.
- Chatham-Kent Utility Services
- PowerStream Inc.
- Horizon Utilities Corp.
- Burlington Hydro Inc.
- Greater Sudbury Hydro Inc.
- Halton Hills Hydro
- Lakefront Utility Services Inc.
- Innisfil Hydro Distribution Systems Ltd.
- Middlesex Power Distribution
- Cornerstone Hydro-Electric Concepts
- Oakville Hydro-Electricity Distribution Inc.
- Waterloo North Hydro Inc.
- Veridian Connections Inc.
- Enersource Hydro Mississauga Inc.
- Guelph Hydro Inc.

Deleted:

Energy Retailers

- Direct Energy Marketing Ltd.
- Just Energy
- Shell Energy

Other

- BDR Energy
- Fasken Martineau DuMoulin
- Independent Electricity System Operator
- Energy Probe Research Foundation
- Pollution Probe
- Canadian Environmental Law Association
- Aiken and Associates
- Ontario Ministry of Energy

The following stakeholders filed written comments:

Electricity Distributors

- London Hydro
- Hydro One Networks, Inc.
- Chatham-Kent Utility Services and Middlesex Power Distribution Co. (jointly)

Ratepayer/Consumer Representatives

- Ontario Non-Profit Housing Association
- Vulnerable Energy Consumers Coalition
- Consumers Council of Canada
- School Energy Coalition
- Advocacy Centre for Tenants Ontario
- Co-Operative Housing Federation of Canada
- Canadian Manufacturers & Exporters
- London Property Management Association
- Mr. Reynolds, Russell, Ontario
- Mr. Honey, Barrie, Ontario
- Mr. Weir, Tamworth, Ontario

Energy Retailers and Others

- Direct Energy Marketing Ltd.
- Just Energy
- Pollution Probe
- Independent Electricity System Operator
- Power Workers' Union

Appendix B
List of Issues Identified by Board Staff
(as attached to the Board's December 6, 2010 letter)

1. Structural Issues

- Are the current three price periods still appropriate given changes in Ontario's electricity demand profile and supply mix? What are the advantages/disadvantages of fewer price periods? Are there significant system cost issues associated with changing the number of price periods?

- Is the current seasonal structure appropriate on a go forward basis? Does the change in Ontario's peak demand and the supply mix affect the seasonal nature of TOU? Are there significant system cost issues associated with changing the approach to seasonality?

- Given that the Ontario electricity system is summer peaking, would it make sense to adopt a structure which specifically addresses the summer peak, i.e., a summer only super peak or critical peak pricing that operated during predetermined peak hours? What type of costs would be associated with implementing such a system?

2. Price Setting Methodology

- The Board has established in the RPP Manual target ratios of 1:2:3. Are these targets still appropriate?

- Should the Board increase its focus on the price ratios when setting prices or continue emphasizing RPP supply cost recovery as the primary objective? To achieve the target ratios, should the Board focus on one price, i.e., increase peak prices or decrease off-peak prices?

- What are the advantages or disadvantages of differentiating the recovery of the variance account such that the variance account balances could be used to either enhance price ratios or buffer consumer bill impacts through accelerated or decelerated recovery?

- Currently the Board allocates forecast Global Adjustment ("GA") costs to be recovered in the price period, which relates to the portion of the load curve that the GA-eligible contract serves. Should the Board continue this practice? If not, what other method should the Board use to recover forecast GA costs?

- Should the Board use the GA cost assignment to enhance the time of use price ratios regardless of "cost causality"?