May 30, 2008

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319, Suite 2700
2300 Yonge Street
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Dear Ms. Walli:

Re: Rate Design for Recovery of Electricity Distribution Costs
AMPCO Comments, Board File No. EB-2007-0031

Attached please find AMPCO's comments on the Board staff discussion paper dated March 31, 2008 regarding Rate Design for Recovery of Electricity Distribution Costs.

Sincerely yours,

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AMPCO Comments
Rate Design for Recovery of Electricity Distribution Costs
Board File: EB-2007-0031

Introduction
The majority of AMPCO's members are served by electricity distributors. Thus, AMPCO has a direct interest in the design of the rates that its members pay.

AMPCO also has a strong interest in the design of rates for other customer classes. Rate design that incents the overall efficient use of Ontario's electricity infrastructure thereby minimizing long term costs, also benefits AMPCO members and their employees. AMPCO members consume approximately 20% of Ontario's electricity.

AMPCO's comments attempt to contribute to all of the issues Board staff have put forward and not just those of immediate interest to large users.

Our comments are organized in two parts.

The first part consists of general comments on the context in which new rate designs should be evaluated and includes a short discussion on the opportunity for innovation that now exists in Ontario.

The second part consists of comments on the staff paper including areas where staff has invited specific comments. The comments are presented in the same order and numbering as the discussion paper.

General Comments
The staff paper appears to focus on the opportunity that implementation of smart meters presents to design rates that may more effectively incent the efficient use of the distribution system. This is a laudable objective, and consistent with the Board's direction.

A new rate design should operate so that, at the least, it does not impede the successful implementation of government policy to significantly improve energy efficiency in Ontario and reduce or reverse growth in demand. Ideally, a new rate design should support and promote these objectives.

Another aspect of Ontario's electricity environment that rate design must recognize and deal with is the trend to lower growth rates and declining per-customer energy intensity. This trend is partly in response to government policy initiatives as outlined above, but is also the consequence of a long term trend that is sometimes called "natural" conservation. If energy intensity declines without a commensurate downward trend in the per-customer asset base, the distribution network must consume an increasing proportion of customer's cost over time, deadening the relative price signal for the energy component of the bill.

Rate design should signal customers to improve utilisation of distribution assets, in order to limit growth in the per-customer and per-kWhr asset base.

Smart meters present a valuable opportunity to not only improve rate design for the distribution system, but to also align incentives that promote efficient use of all electricity resources.

Finally, the report notes several areas where considerations about data, judgment uncertainty, uneven implementation of smart meters and the historical development of the Ontario distribution networks appear to limit the opportunity for innovative, "blank sheet" rate design. These obstacles may be more apparent than real, and the specific comments that follow include some suggestions for removing them.

Specific Comments (according to numbering in the staff paper)

3 Rate Design Principles

3.2 Fairness Principle

For many years, AMPCO has been consistent in asserting that cost causality is the principle most important to fair and efficient rate design. To the extent a rate design or charge determinant departs from causality, the principle of fairness underlying confidence in the rate setting process is comprised, and so is the effectiveness of the rate design.

Customers that are overcharged are presented with incentives to adjust behaviour that may in fact be uneconomical, such as investing in unnecessary equipment, not investing in more productive equipment or even moving to another jurisdiction. On the other hand, customers that are on the receiving end of inter or intra-class subsidies do not receive the incentive they should for efficient behaviour.

While no practical rate design can eliminate all cross-subsidies, inter-class cross subsidies in particular should be eliminated so much as is possible, and not allowed to continue based on concerns about data quality or rate volatility. There are good and viable ways to address legitimate concerns around applying cost causality that don't require condoning persistent cross-subsidies.

One reason frequently given explanation for not moving to a revenue/cost ratio of 1 for all classes is the issue of the imprecision of the cost allocation process. This is a fair concern, but it must also be recognized that the cost allocation process involves many judgments, with no known reason why they should not tend to generally balance out to an approximately correct result. AMPCO submits that a diligent cost allocation process must attempt to define a R/C of 1 as much as possible and then apply it. The use of narrow bands of "acceptable" R/C ratios should be limited to defining the amount of drift that may be tolerated without correction. In AMPCO's view, such bands should be narrow (a few percent at most), symmetrical and consistent across customer classes.

Rate stability need not be an impediment to achieving proper cost causality. The rate impact of adjusting a customer class to unity can be mitigated through the use of deferral accounts, which should be the responsibility of the subsidized class.

Revenue to cost ratios within a customer class will always vary somewhat, but careful rate design should prevent the worst problems. The recent initiative by Hydro One in the design of charge determinants for the proposed subtransmission class is a good example of how intra-class cross-subsidies can be minimized.

3.3 Efficiency Principle

Distribution rate design should not be strictly limited to incenting the efficient use of the distribution system. While price signals provided through rate design need not necessarily be directed specifically to the use of the transmission or supply systems, they should be as consistent as possible with these other signals (and vice versa) and, where reasonable, amplify them.

In its direction to distributors on the use of third tranche funding for CDM, the Board directed the use of a total resource cost test (TRC), whereby the costs and benefits of CDM programs directed at customers were assessed on all the significant dimensions of energy cost, including future avoided costs. A CDM incentive is in reality an energy use price signal, so it would appear that a rate design, which is also an energy use price signal, could be evaluated on a TRC basis to determine if it is properly aligned with the policy directives of the government. Of course, a TRC test or variant of such would be complementary to the basic tests on fundamental principles.

3.4 International Experience with Innovative Rate Designs

The lack of applicable international guideposts strongly supports the idea that testing several options may be the only practical way to select the optimal design(s). We would suggest that the Board set specific experimental design requirements around such pilots, so that results from different options can be usefully compared. Also, consistent with the comments in 3.3 above, evaluations should be on the effect of rate design on customer behaviour as it drives cost on all parts of the supply system.

4 Customer Classifications

Customer classification may be a solution to a problem that no longer exists.

When Ontario was first electrified, there were relatively few uses for electricity, which inherently made consumption patterns homogenous across large groups of users. Meter reading and billing were manual processes that could only be made efficient through a high degree of process standardization. In this environment, assigning broad groups of customers to classes made good sense.

Today, the environment is much more complex. Customer usage patterns are far more heterogeneous, across all sectors and within each class. For example, in a situation where there is an electrical appliance in a residential building that houses two businesses, the consumption pattern is very different than the neighbors, even though all are in the same rate class. Similar increases in heterogeneity have occurred in the commercial, farm and residential sectors.

The advent of smart or interval meters at almost all customer delivery points, combined with powerful computer systems and billing engines that can essentially customize each customer's bill makes it possible to reverse the classification paradigm.

A way to view this is to see the LDC as providing a suite of services that include energy delivery, meter service, billing services, credit, standby service, customer support and so on. Each customer could be billed for its individual use of the service suite.

Implementing such a system would of course produce broad groups of customers using the exact same set of services, similar to today's customer classes. However, it would have two important advantages over the current system. First, the inherent flexibility in such an arrangement would provide customers the freedom to use and pay for those services they require, and in turn provide the distributor with information on the value of the non-essential portions of its services (e.g., credit or meter service). Second, the increased unbundling inherent in such an approach may enable other service providers to enter the business.

This is obviously a concept that cannot be fully explored in a single comment paper. However, the Board should consider challenging the basic paradigm of customer classification as an artifact of history that may no longer be useful and may even become an impediment to future progress.

4.1 Issues Relevant to Establishing Customer Classes

Notwithstanding the foregoing comments, this discussion captures the main aspects of cost that are driven by differences among customers.

It may be worth adding payment risk as a differentiator.

4.2 Options for Customer Classes

The most important determinant of classification should be the customer's use of distribution assets, both in terms of what assets are required to serve the customer and the pattern of demand the customer places on those assets.

The distinction between a three wire (subtransmission) and a four-wire (primary) system is driven by specific utility engineering considerations, has limited relevance to customers and should not be used to assign customer classifications. Many utilities, including Saskatchewan and some residual portions of the Ontario distribution system, use three wire primary distribution lines.

Whether a customer uses a three-wire or four-wire system is a local engineering issue, not one driven by the customer's load characteristic.

Most important is consideration of the distribution assets normally required to supply service to the customer.

To the extent cost causality is determined by asset use, the best way to view the system is by using a “waterfall” paradigm. With rare exceptions, power in a distribution system flows “downhill” (declining voltage), from the supply point at the transmission system to the voltage at which the customer takes delivery.

All Distribution systems are two or three tier systems. The lowest tier (secondary) serves customers whose load characteristic can be most efficiently met at secondary voltage (<750V).

The next tier (distribution primary) serves customers that can normally be efficiently served from a distributing station, if the utility has such (almost all do).

The top tier (sub-transmission or bulk) serves the other tiers, plus those customers that cannot normally be served efficiently from a distributing station, because their load would normally be considered large enough to justify its own power transformer. The top tier receives its supply from the transmission system, which is the technical characteristic that should be used to determine the nature of the customers that need to receive power from it.

It is generally accepted good engineering practice that customers with demand above 3,000kW should only be served by lines that are sourced at the transmission system. The reason for this practice is simple: to supply such customers from a line that is sourced at a distributing station introduces an unnecessary expense for redundant transformation and adds to system losses. Such situations also make management of the load on the distributing station difficult, since a single large customer could tie up 30%or more of the station capacity.

This is not to say that situations do not exist where good engineering practice has not been followed for one reason or another. Milton is a good example. In Milton, some large users are connected to the primary system. However, these connections were most likely driven by a political desire to reduce the connection cost for new industry in the town, a driver that should not be present for a commercialized distributor.

For purposes of customer classification, the best long term approach should be based on the assets that would normally be used to serve the customer. Where exceptions occur, the specific lower tier assets can be shared by the customer class using them, along with the other classes being served. However, an arbitrary classification based on the number of wires is fundamentally artificial and invalid.

With respect to users of the secondary system, it is not clear that a distinction between single and three phase service is necessary for purposes of classification. It may be more appropriate for three phase supply to be seen as a specific service option within a more general secondary classification. Besides the efficiency benefit of three phase supply for the customer, it must also be recognized that balanced three phase loads improve the efficiency of the distribution system. This is one reason many distribution systems outside North America provide only three phase supply.

Interruptible Rates

Interruptible rates are another artifact of the past, with the problems the paper describes.

With the advent of real time electricity pricing and several options for loads to benefit from being demand-responsive (including distributor programs such as Peaksaver), the value of interruptible rates to the supply system has diminished.

For distributors with specific demand management requirements, tailored demand response programs seem like a more useful approach than a special rate class.

4.3 Evaluation of Options for Customer Classes

As noted earlier, cost causality is closely linked to the normal (technically efficient) location of the customer in the distribution network hierarchy, not by supply voltage per se. Also, the distinction between three wire and four wire is arbitrary, without a technical rationale, and has the inevitable consequence of requiring customers to pay for assets that cannot and do not serve them. The Milton example is excellent for illustrating this point: the tentative assignments into the "primary" class would have 50kW demand loads and 4,900 kW demand loads subject to the same cost allocation parameters (Table 2).

For customers other than those served at secondary voltage, we recommend a customer classification test based on the maximum demand of the customer and the normally preferred supply from an engineering perspective (line supplied from transformer station or line supplied from distributing station). In those distributors where large volume customers have been connected in a technically sub-optimal manner, the specific distributing station and "primary" assets serving some members of the class could be assigned to the class and their costs spread across the class. This should mitigate the historical "accident of location" cases that have developed as in Milton, albeit with some intra-class subsidy consequence.

Consistent with all the earlier comments, there should be fewer distinct classes. The Hydro One approach to the ST class provides an illustrative example of how this approach could be pursued.

Demand is the best proxy for determining how assets should be allocated to customers, since demand is the principal driver of system design.

5 Rate Design Issues

5.2 Fixed Variable Split

5.2.1 Price Signals in the Rate-setting Context

There should be a connection between variable rates and long run variable cost. Without such, customers will not receive a signal concerning the relationship between behaviour and future consequences.

If variable charges also amplify the effect of customer behaviour on other long run variable costs such as generation and transmission, they will be more effective. Most customers neither know nor should have to care about which part of their future electricity supply cost is being driven by their present behaviour.

Despite limited studies, customer response to variable rates will remain essentially untested until such rates are more pervasive. Short run pilot projects do not provide for the evolution of customer behaviour over time, nor do they provide the customer with technologies that will arise only when large numbers of customers wish to change their behaviour. For example, there are few if any clothes driers yet available with timers, nor are there residential freezers that can store "cold" during peak hours.

5.2.2 Current Cost Allocation

As with other aspects of cost allocation, the fixed monthly charge should be based on real costs. This implies that the fixed charge should be calculated using the "a+b+c" approach, including the minimum system cost.

However, the existing methodology for determining minimum system cost and capacity should probably be reviewed with a more realistic definition reflecting what a real world minimum system would provide and cost. Such a review would likely raise the fixed charge, but this would be appropriate.

5.2.3 The Rationale for a High Fixed Charge

As noted above, there is no good rationale for a "full cost recovery" fixed charge, except to remove all risk for the distributor. This rationale is insufficient to consider ignoring the consequence of disconnecting customer behaviour from long run variable cost.

The idea of a "variable" fixed charge based on past behaviour is used successfully in PJM for transmission customers. It could be applied to customers that are more or less fixed in place and likely to stay, if the distributor could adapt to changes in demand. However, it would likely be hard to implement for secondary customers that exhibit high turnover rates.

Service amperage is a poor proxy for demand for secondary customers, since the connections are of standard capacity (usually 200 Amps).

5.2.4 The Rationale for a High Variable Charge

Given the long life and nature of distribution assets, it is hard to see how an artificially high variable charge will significantly lower the fixed portion of the distributor cost, even in the very long run.

Capacity pricing is probably impractical for the majority of distribution cases, for all the reasons cited. Capacity pricing also sends a relatively poor price signal, since it tends to be fixed for periods of time.

The use of a 1-CP pricing signal does not seem practical or productive for distribution systems. Since most of the load in Ontario is served by LDCs, it would likely only move the peak around a bit. Factually, most Ontario distributors seem to be 12-CP utilities, although there is evidence this is changing with the increase in summertime loads.

5.3 Revenue Stability

While the development of 3rd Generation IRM seems headed to a price cap mechanism, the RSAM approach proposed by the EDA does have merit. It is not clear why a reduction in risk for the LDC would be seen as a disadvantage, so long as ROE and capital structure were adjusted to reflect such a change.

5.4 Billing Determinant Options

5.4.1 A Price Signal for Short Run Distribution Consumption Efficiency

The fixed charge should be adequate to recover short run fixed costs, including a practical minimum system.

5.4.2 A Price Signal for Long Run Distribution Utilization Efficiency

Real time demand seems the best determinant of long run marginal cost. A reasonable and useful proxy for secondary customers may be energy in a TOU environment (i.e., add a TOU price signal for distributor variable cost).

The statement that peak instantaneous demand is the determinant of system capacity is incorrect. Almost all distribution system equipment reacts to increases in demand through the effects of equipment heating, which smoothes out demand effects over a period of time determined by the size and type of equipment. This includes protective equipment such as fuses. Thermal time constants of 20 minutes to one hour are most common.

5.4.3 A Price Signal for Energy Efficiency

The suggestion that the distribution variable charge should align with the TOU structure is a good one. There may be a sound argument for basing all of the variable charge on the peak TOU hours only, as this would more accurately reflect the distribution system cost driver and amplify the commodity price ratio between peak and off-peak.

6 Rate Design for the Single Phase Secondary Class

6.2 Design of a 100% Fixed Monthly Charge

There is no good rationale for such a charge as it runs completely counter to all ideas that price should incent behaviour. The argument by distributors that their portion of the energy bill is insignificant is neither accurate nor relevant. Moreover, distribution costs are currently the fastest growing portion of customers' total bills.

6.3. Design of a Variable Charge Based on Capacity

As noted earlier, capacity is a poor proxy for demand in the secondary class. Moreover, the impracticalities of load limiters and other approaches would likely increase system cost rather than incent more efficient utilisation. The rate of turnover of secondary customers also argues against retrospectively based capacity charges.

6.4 Design of a Variable Charge Based on Demand

Since demand is the primary driver of variable system costs, this is the logical charge determinant. However, using demand directly as a separate charge determinant in a TOU environment may be confusing.

6.5 Design of a Time of Use Distribution Rate with a Consumption Determinant

For secondary customers, energy consumption during peak hours in a TOU regime should be a workable surrogate for demand. This approach would have the added advantage of amplifying the conservation signal inherent in TOU, while limiting the complexity of the bill.

There may be merit in a higher variable distribution charge during summer months in southern Ontario.

6.6 Single Phase Secondary Customer Rate Changes

So far as load factor differences drive differences in distributor cost, this should be reflected in the cost allocation study.

Revenue to cost ratios should not be constrained by any factors other than limitations on the knowledge of cost causality. Even these limitations should be rigorously determined and conscientiously minimized to the extent possible.

The rate impacts illustrated in Tables 4 -6 are relatively modest, especially when placed alongside the variability customers routinely deal with in prices for gas, food and other necessities.

6.7 Residential Sub-Class

With current legislation in place, this sub-class will need to be maintained. However, the Board should approach the government about eliminating it. The distinction is no longer useful.

7 Rate Design for the Three Phase Secondary Class

This class designation is probably unnecessary. With smart meters and TOU billing, the impact of load factor differences should be addressed and the cost of three phase service could be covered as a specific service charge.

Since interval meters collect better data than smart meters, the differences should be reconcilable for the distributor without creating significant charging inequalities.

8 Rate Design for the Primary Class

8.2 Contract Capacity and Demand Based Rates

As noted previously, a capacity charge may work well for this class. Actual monthly demand may work better in an environment, where CDM is important, especially if monthly demand charges vary by month of the year to reflect the relative importance of peak in the summer and winter versus the shoulder months.

9 Rate Design for the Sub-Transmission Class

We have previously noted that we do not believe this class should be defined by the number of wires in the line.

Sub-transmission customers are often wholesale market participants, but these are not in the majority.

Primary and Sub-transmission customers could appropriately be served by the same rate design, although cost allocation would be different for different levels of demand.

10 Rate Design for Embedded Distributors

If distributors are commercial entities, then the specific nature of their business should not affect their classification any more than it should for other businesses. Where embedded distributors may require different treatment is in the area of prudential requirements, which as regulated entities should be lower than for higher risk businesses.

As with other customers, embedded distributors should receive fair cost allocation in line with their use of the distributor assets. However, this customer sector should not be defined as a separate class solely to ensure a level of fairness that is not available to other customer classes.

10.1 Fixed Rates

The idea of a capacity based rate ratchet may make sense for the primary and large user classes generally, not just for embedded distributors.

10.3 Time-of-Use Based Charges

This option is equally attractive for primary and large users.

11 Rate Design for Load Displacement Generation

The text of this section shows some confusion between load displacement generation (generation that reduces or eliminates a customer's demand) and distributed generation (generation that injects power onto the distributor's system).

11.1 Fixed Rates

It is hard to see how a fixed rate can work for Load Displacement Generation, since demand may vary dramatically by year as well as by month.

A fully fixed charge equal to other customers in the non-generation rate class reflective of the customer's operation would not properly recover the cost of standby capacity.

A fixed charge that replaces the minimum system cost with the actual system capacity cost required by the customer may work best for load displacement generation.

11.4 Load Diversity

If it is government policy to encourage load displacement generation, then some sort of diversity credit should be available. However, the initial cost of such credits that will be incurred before load displacement generation numbers reach sufficient levels should not be borne by other customers on the specifically affected distribution system. Such credits should be funded through other initiatives until they produce matching value for all customers. The stimulus should be borne by all customers, not just those of the specific LDC.

12 Rate Design for Unmetered Scattered Load

Cable amplifiers should not be lumped in with lights for identical treatment in this category. The consumption of many of these units is inherently unpredictable, especially given the increasing penetration of heaters and the sometimes un-noticed changes to equipment that may have different energy consumption than the equipment on which rates were estimated. Load from many of these devices has grown to the point that they should probably be metered, although some sort of network metering solution may work (these are, after all, communication devices). The cable industry should propose a better solution than simply not metering.

Streetlights and sentinel lights have identical and predictable load shapes, and so should belong to the same class. The cost allocation reviews for the streetlight and sentinel light class have shown that these classes are uniformly under-charged. This effectively reduces the price signal that should incent innovation in more efficient lighting and should be corrected.

13 Rate Design for Metered Scattered Load

As with load displacement generation, it is important that the language of discussion reflects the different situations in this category.

There are basically two different situations covered in this section.

The first and simplest is a single customer with multiple locations fed from multiple sources. These customers, such as Bell Canada, may have over a thousand locations, taking supply from a thousand delivery points. The locations do not interact in terms of demand and thus provide no diversity benefit for the distributor. For this example, consolidated billing provides some cost savings for the customer, but not much for the distributor. There may be a good argument for some credit on the fixed charge to reflect reduced meter-tocash cost, but this is often offset by other factors of account management. For example, because of the many delivery points associated with consolidated bills, most distributors need to manually review these bills for accuracy.

The second example is where a customer has a single building or group of buildings (campus), with multiple metered delivery points. In such a case, the customer should be eligible for a diversity benefit, if the aggregated demand is a more accurate cost driver for the distributor than the sum of the individual meter demands. This would occur, for example, where the campus was all fed from a single station or line asset. For loads such as school boards and retail chains, it is difficult to see how aggregated demand billing could benefit the customer or the distributor, since such operations have almost identical load patterns and impact geographically diverse parts of the system.

14 Revenue Recovery of Distribution System Losses

Until smart metering data makes it possible to more accurately evaluate actual system losses, applying system losses differentially on a TOU basis may be a sensible first step. Again, as with the demand charge, this should act to amplify the price signal that incents demand response and conservation in peak hours.

Conclusion

This staff paper provides an excellent basis for the discussion about developing innovative, efficient and effective rate design concepts for the future. However, this is not the time to be concerned about transitional impacts. Moreover, a sound and enduring rate design cannot be founded on inaccurate cost allocation, so this area requires more attention and less reliance on arbitrary measures to reduce complexity.

This should also be the time to ensure that good distribution rate design aligns with government policy to improve the efficiency of the whole electricity supply system, not just distribution.

Finally, the base concept of classification needs to be challenged in depth.

AMPCO remains committed to assisting the Board with the development of this project, in whatever capacity the Board feels is of value.

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