Ontario Energy Board

Electricity Distribution Rate Design (EB-2007-0031), Phase 2 – Session 1

Context of the Rate Design Review

October 17, 2007

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Research Associates

Ontario's "New" Distribution Sector

- Rates have been unbundled
- Encouraging a "Culture of Conservation" is a government priority
- Widespread implementation of smart meters is imminent
- Distributed generation is expected to become increasingly important
- There is increasing reliance on efficient price signals

? Others

Unbundling

Effects:

- ➢ Dx rates recover Dx costs
- ➢ Dx costs are transparent
- ? Others

Issues:

- ➢ Should R/C ratio be 1.0 for each class?
- ➢ Should rate design reflect cost allocation?
- ➢ How many cost drivers are appropriate?
- ➢ Is complexity of rates a constraint?
- ? Others

Culture of Conservation

Effects:

- ➢ External costs & benefits are relevant
- ➢ Increased LDC role in CDM
- ➢ Market transformation (long run view) is relevant
- ? Others

Issues:

- ➢ Does “Culture of Conservation” apply to Dx?
- ➢ What externalities are relevant?
- ➢ If it does, what does Dx conservation mean?
- ? Others

Smart Meter Implementation

Effects:

- ➢ Hourly data available for all customer classes
- ➢ But not available on real time basis
- ➢ Improved load research
- ? Others

Issues:

- ➢ Should demand be a Dx billing determinant?
- ➢ If so, use CP or NCP; annual or monthly, etc.
- ➢ Does demand or capacity drive costs?
- ➢ How much rate complexity is acceptable?
- ? Others (Simplified Bill)

Distributed Generation

Effects:

- DG connected to Dx grid
- DG comes in several forms with different impacts on the Dx system
- Potential for long run diversity benefits
- ? Others

Issues:

- Is DG like other classes of Dx customers?
- What DG services do distributors provide?
- Should rates reflect LR or SR costs and benefits for Dx (e.g., diversity in LR)?
- ? Others

Efficient Price Signals

Effects:

- ➢ Price reflects “true” cost
- ➢ But volatility mitigated
- ➢ Gradual transition to efficient price signals
- ? Others

Issues:

- ➢ Is goal efficient prices for Dx services, or efficient billing determinants in aggregate?
- ➢ What are the Dx cost drivers?
- ➢ How do consumers respond to rate designs
- ? Others

Other Issues

Effects:

- ?
- ? Others

Issues:

- ?
- ? Others

Summary of Objectives

- What are the stakeholder views regarding the objectives of distribution rate design at this time?
  - What existing problems can be corrected?
  - What opportunities exist for enhancing efficiency and/or fairness?
  - Stakeholder views?

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Review of Issues and Options

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“In-Scope” Issues

1. Rate design principles (A)
2. Customer classifications (B)
3. Consistency of rate design (C)
4. Billing determinants (A)
5. Interruptible sub-classes (B)
6. Fixed/variable split (C)
7. Rate harmonization (A)
8. Charging for losses (B)
9. Generator charging methodologies (C)

Format for this Agenda Item

- Break into three sub-groups (A; B; C)
  - Each sub-group has three issues
- 1 hour of “option generation”
  - ≈30 minutes to identify options (10 min. each)
    - No debate on options - brainstorming
  - ≈30 minutes to rank by relevance
- After coffee, report to full group
  - Others can add to list (no debate)
- Staff to use results to set agenda for the next two sessions

1. Rate Design Principles

Question: Does the new context alter the traditional view of rate design principles?

Examples:

- Improved measurement may enable efficiency to be a more dominant priority.
- Consistency across types of customers may be more important.
- Customer choice may be a more relevant consideration.
- Conservation may be an explicit goal.

2. Customer Classifications

Question: How can the traditional approach to customer classification be altered to better reflect the current context?

Examples:

- Classes are determined by similarity in service characteristics.
  - If the Res/GS energy charge is replaced by a demand charge is pattern of use (load factor) a relevant difference?
- What difference remain relevant?

3. Consistency of Rate Design

Question: Is consistency of the rate design a more important consideration in the new context?

Examples:

- If causal costs are similar for all Dx customer classes, greater consistency in the structure and level of rate may be appropriate.
- Are there benefits to greater consistency in rate design among distributors (provincially; regionally)?
- How much consistency is appropriate?

4. Billing Determinants

Question: How can the billing determinants be changed to better reflect rate design principles in the current context?

Examples:

- Should the rate design reflect cost causality (per cost allocation) more rigorously.
- Charges could be based on capacity (service voltage and amperage)
- Charges could be based on actual demand (CP or NCP; monthly or annual).

5. Interruptible Sub-Classes

Question: How can interruptible rates be used to increase efficiency in the current context?

Examples:

- Could all classes have the option of interruptible rates?
- Could the basic rate design include an “interruptible component”?
- How would a cost-based charge for interruptible service be determined?
- How would a system-benefit based charge for interruptible service be determined?

6. Fixed/Variable Split

Question: How might the current fixed/variable split be changed to enhance efficiency/fairness in the current context?

Examples:

- Replacing the Dx energy charge with a capacity charge would eliminate the variable component.
- Replacing the Dx energy charge with a demand charge would change the incidence of the variable component significantly.
- How should the split be determined?

7. Rate Harmonization

Question: What forms of harmonization are consistent with the current context?

Examples:

- Harmonizing the rates of small LDCs through a single rate order could increase inter-LDC fairness (similar LDCs; within regions; provincially).
- Rates can reflect either distributor costs or customer value.
- What differences in Dx “services” justify rate differences (within LDC; between LDCs)

8. Charging for Losses

Question: In the new context, how might the efficiency and fairness of charging for losses be improved?

Examples:

- Losses increase with distance and lower voltage; location/facilities-based adders for losses would reflect cost causality.
- Losses increase with demand; demand-related charges for losses would reflect cost causality.

9. Generator Charging Methodologies

Question: In the new context, how might DG customers be charged for the Dx services they use?

Examples:

- Creating categories of DG customers using different services might better reflect their causal costs.
- How can rates reflect be designed to reflect current and/or future system benefits of DG (e.g., diversity)?

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Electricity Distribution Rate Design (EB-2007-0031): First Stakeholder Session

Approach to Examining the Issues and Evaluating Options

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Survey of Other Jurisdictions

- Lead responsibility: Bob Cappadocia (ERA)
- Rate design options that have been developed in response to the implementation of smart meters appear to focus on charging for the power itself.
  - Less attention has been paid to innovative Dx rates.
- ERA is surveying other jurisdictions for innovative distribution rate designs that utilize smart meter information (demand).
  - California; Scandinavia; Australia; Others???
- Customer responses to demand charges for power are also being surveyed to assist in estimating the potential impact of Dx rate design options.

Modeling of the Impact of Options

- Lead responsibility: Bruce Bacon (ERA)
- Milton Hydro smart meter data is being used
  - Base Case – Fixed charge based on minimum system + volumetric (kWh & kW) for remaining
    - Actual adjusted for cost allocation study
  - Case 1 – Fixed charge based on avoided cost (i.e., metering + billing costs) and volumetric (kWh or kW) for remaining
  - Case 2 - Fixed charge based on avoided cost + capacity charge based on service amperage + plus volumetric based on CP demand
  - Case 3 – 100% fixed charge
  - Case 4 – 100% volumetric charge

Preliminary Results: Case #1

Greatest impact is on residential customers

- Monthly service charge significantly lower
- Average customer sees almost no change
- Low use ⇒ lower bill (up to 50%)
- High use ⇒ higher bill (below 10%)

- GS impact is directionally similar
  - Low use ⇒ lower bill (up to 5%)
  - High use ⇒ higher bill (below 5%)
- Large users see virtually no change

Preliminary Results: Case #2

Additional data required.

No preliminary results.

Preliminary Results: Case #3

Greatest impact is on residential customers

- Monthly service charge significantly higher
- Average customer almost no change
- Low use ⇒ higher bill (up to 50%)
- High use ⇒ lower bill (below 10%)

- GS impact is directionally similar
  - Low use ⇒ higher bill (up to 25%)
  - High use ⇒ lower bill (below 15%)
- Large users see changes +/- 1% to 4%

Preliminary Results: Case #4

Greatest impact is on residential customers

- Monthly service charge = $0
- Average customer almost no change
- Low use ⇒ lower bill (up to 60%)
- High use ⇒ higher bill (below 10%)

- GS impact is directionally similar
  - Low use ⇒ lower bill (up to 10%)
  - High use ⇒ higher bill (below 5%)
- Large users see virtually no change

Additional Cases to be Modeled

- Different rate classes, such as
  - Combine residential and GS
  - Other possibilities
- Rate classes based on service amperage and voltage connections
- Stakeholder suggestions