34 King Street East, Suite 600
Toronto, Ontario, M5C 2X8
elenchus.ca

# General Issues

## Defining Load Displacement Generation

Background

Load Displacement Generation is the term used to describe generation that is owned by an electricity customer and is used to supply part or all of the customer's electricity needs. In some instances the generated electricity may exceed the customer's needs and could be exported to the grid.

The generator is located behind the meter that measures the customer's electricity supplied by the distributor.

Issue

How should Load Displacement Generation be defined?

Alternatives

Load Displacement Generation can be defined to include generation that:

1. Is used exclusively by the customer for displacement of their own needs (either partially or fully); or
2. Is used to displace the customer's own load, either partially or fully, and to export any excess power to the grid.

Elenchus Recommendation

Elenchus recommends that, for the purposes of the current OEB policy review on developing Standby rates to be used by distributors in Ontario, the definition for Load Displacement Generation should be:

> *Generation installed behind the customer's meter that is used to partially or fully replace the customer's electricity needs and is connected to the distribution system. Excess generated electricity may be exported to the grid.*

Rationale

Customer's that use their generation to displace their own needs but also export to the grid still require standby service from their distributor for that portion of their generation capacity that is used to supply electricity for their load requirements. Therefore, they should be included in the definition of Load Displacement Generation.

This OEB policy review on Standby rates deals with developing policy and guidelines for distributors, therefore, Elenchus recommends that only distribution customers with Load Displacement Generation be considered in the definition.

## Distributor-Specific or Province-Wide Standby Rate

Background

A distributor may develop its own Standby rates based on its own assets and costs or the Ontario Energy Board may decide to approve a Province-wide Standby rate, as it has done for MicroFIT distribution charges.

Distributor's individual Standby rate would require each distributor to follow the guidelines to be developed by the Board and establish unique distributor specific Standby rates.

A Province-wide Standby rate could be developed following the approach taken by the Board in developing MicroFit charges. The Board identified the cost elements included in the Microfit charge and the information from all distributors is used in developing the Province wide rate.

Issue

Should there be a Distributor-specific or a Province-wide Standby rate?

Alternatives

a) Should each distributor have its own Standby rate; or
b) Should the Board develop a Province-Wide Standby rate.

Elenchus Recommendation

Elenchus recommends that each distributor should develop its own Standby rates according to Board guidelines.

Rationale

Allowing distributors to develop their own Standby rate based on their own costs would allow for cost-based Standby rates to be developed. As such, customers with Load Displacement Generation will only pay for the costs that they impose on the distributor.

# Threshold for Standby Rates

## Background

Customers with Load Displacement Generation range from very small, less than 50 kW, to very large customers, above 5,000 kW. Currently, some LDCs are using a threshold to determine if standby rates should be applied to an LDG customer. The threshold utilized by Ontario's LDCs is based on the size of the LDG facility and ranges from (500 kW to 1MW). For customers below the threshold, Standby rates do not apply and the net amount of electricity consumed by the customer, that owns generation behind the meter, is charged by the distributor at the standard customer classification rate.

## Issue

Should a threshold be established for the application of Standby rates?

## Alternatives

The possible threshold for applying Standby rates can be:

1. 0 kW (no threshold);
2. Above certain size (e.g. 500 kW);
3. Above a certain level of the customer's load being displaced by the LDG facility (e.g. 50%); or
4. If the customer's generation needs exceeds certain percentage of the distributor's total demand, (e.g. more than 10% of distributors' maximum demand).

## Elenchus Recommendation

Elenchus recommends that a threshold of 500 kW should be used to establish a Standby customer class.

## Rationale

Establishing a separate customer class will require additional efforts by distributors. The additional effort can be justified if the customers are of significant size and have unique characteristics that from a cost-causality perspective impose incremental costs on distributors compared to the other distributor's customers.

# Cost Allocation Issues

## Background

Distributors own assets and incur expenses in delivering electricity to their customers. Most of the assets and expenses related to the delivery of electricity are associated with more than one customer class, that is, they are largely shared assets and expenses. Cost allocation is commonly used in the utility industry to apportion assets and expenses amongst the customer classes served by the utility. The allocation methodology is based on cost causality principles and is used to apportion assets and expenses in a fair and reasonable manner. The costs of the assets and expenses allocated to each customer class are then the basis for determining the utility's distribution rates.

Traditional cost allocation methodologies involve three steps: Functionalization, Categorization (or Classification), and Allocation.

**Functionalization** is the process of grouping assets and expenses of a similar nature, and is the first step in cost allocation. For example, functions could be line maintenance, transformer maintenance, customer service, and meter reading. The assets or expenses contained in each of the distributors chart of accounts is identified so that the costs can be appropriately assigned to the identified functions that the distributors perform to serve its customers.

**Categorization or Classification** is the process by which the functionalized assets and expenses are classified according to cost drivers. These cost drivers are typically demand, energy and/or factors specifically related to the customer or class. The total costs for each function are the costs the distributor incurs to meet the quantum of system demand, energy throughput or customer specific factors such as the number of customers.

**Allocation** is the process of attributing the demand, energy, and customer related assets and expenses to the customer classes being served by the utility. This is the final step to establishing the base costs by class for subsequent rate design purposes. This allocation is accomplished by identifying variables called allocators that are related to demand, energy, or customer counts. For example, if the necessary investment in a particular class of asset (e.g., certain upstream transformers) is caused strictly by the single peak in annual demand, then the relevant costs would be allocated using the estimate of the single system peak demand, which in the Board's Cost Allocation Methodology is the 1-coincident peak (1-CP) method for each class.

# Separate Customer Class for Customers with Load Displacement Generation

## Background

Customers with Load Displacement Generation may be grouped in a separate customer class for purposes of determining the distribution costs that should be allocated to the class in a Cost Allocation Study. A Cost Allocation Study applies cost causality principles in order to apportion costs amongst customer classes.

Currently, 11 distributors have approved standby rates and a standby power rate class. 4 distributors have approved standby rates but do not have a standby power rate class.

## Issue

How should customers with Load Displacement Generation be treated in a Cost Allocation Study?

## Alternatives

Customers with Load Displacement Generation can be:

1. Grouped in a separate customer class; or
2. Grouped with other similar type customers that do not own generation (e.g. General Service above 50 kW, Large User).

## Elenchus Recommendation

Elenchus recommends that customers with Load Displacement Generation should be grouped in a separate customer class. The separate customer class would reflect the costs associated with providing standby service to the portion of the customer's load being displaced by the LDG facility. The costs related to the load that the customer requires for its needs, which are not being displaced by its own generation, would be recovered by distributors by way of their standard distribution rates, i.e. General Service or Large User rates.

## Rationale

The purpose of the Standby Rates policy review is to establish a common approach that distributors in Ontario could follow in order to establish Standby rates. Having a separate customer class for customers that own generation would provide the necessary asset and expense information required in order to establish cost-based Standby rates by distributors.

# Incremental Costs Imposed by Customers with Load Displacement Generation

## Background

Customers with Load Displacement Generation may impose different costs on distributors compared to the distributors' other customers. In addition to the standard costs that distribution customers impose on distributors, customers with Load Displacement Generation may require additional costs related to: connection, meter reading, billing, and customer care.

## Issue

What are the additional (incremental) costs imposed on distributors by customers with Load Displacement Generation?

## Incremental Costs

The possible additional costs imposed by Load Displacement Generation customers on Distributors may include:

1. Distribution Asset related (e.g. transformer and/or line capacity);
2. Meter;
3. Meter Reading;
4. Billing;
5. Customer Care; and/or
6. Transmission Asset related (e.g. Network, Transformation and/or Line Connection capacity).

Costs that are paid by the customer that owns Load Displacement Generation should not be included in the determination of Standby rates.

## Elenchus Recommendation

Elenchus recommends that all of the above listed costs should be explored as possible incremental costs imposed on distributors by customers with Load Displacement Generation. To the extent that these incremental costs can be quantified and are significant from the perspective of the distributor, they should be taken into consideration in a distributor's Cost Allocation Study and should be recovered from customers with Load Displacement Generation by way of Standby rates.

## Rationale

Identifying and recovering the incremental costs imposed by customers with Load Displacement Generation from these customers using Standby rates would ensure that customers with Load Displacement Generation pay their fair share of costs and that they are not being subsidized by the distributors' remaining customers.

## Direct Allocation of Costs

Background

A Cost Allocation study is used by utilities to apportion the use of shared assets and expenses amongst the utilities' customers using cost causality principles in order to determine cost-based rates.

To the extent that certain assets and expenses can be attributed directly to only one customer (or group of customers) and are not shared with other customer groups, these assets and expenses can be directly assigned to the appropriate customer (or group of customers) in a Cost Allocation Study.

Currently, one LDC seems to use a direct allocation methodology to allocate certain assets to the standby power rate class.

Issue

Should assets and expenses be directly allocated to Standby customers in a Distributor Cost Allocation Study?

Alternatives

Assets and expenses in a distributor's Cost Allocation Study can be apportioned amongst the distributor's customer groups:

1. Using the Categorization and Allocation steps in a Cost Allocation Study;
2. Directly assigned to a particular customer class; or
3. Combination of above.

Elenchus Recommendation

Elenchus recommends that distributors should first attempt to identify assets and expenses that may be used only by customers with Load Displacement Generation and are not shared with other distributor's customer classes. These assets and expenses should be directly assigned to the Standby customer class. All other assets and expenses that are shared by Standby customers with other distributor's customers, should be apportioned amongst the distributor's customers classes based on the OEB's

Cost Allocation Study that uses cost causality principles in order to apportion shared assets and expenses to the distributor's customer classes.

Rationale

Directly assigning assets and expenses to a customer class is the preferred method of apportioning distributors' assets and expenses to the distributor's customer classes. This ensures that the distributor's customers that impose costs on distributors are charged their fair share of assets and expenses and are not being subsidized by other customer classes that do not use the assets or impose the costs on distributors. For assets and expenses that are shared by more than one customer class, the OEB's Cost Allocation Study should be used to apportion the assets and expenses using cost-causality principles that provide the basis for establishing cost-based rates.

## Rate Design

Background

Rate design is the process used to establish the charges that customers will pay in order to recover the Distributor's OEB approved revenue requirement. The rate design can include a fixed and/or a variable charge. In theory the fixed charge is intended to recover the fixed costs incurred by the distributor in providing services to its customers and the variable charge is intended to recover the variable costs incurred by the distributor in providing services to its customers. In practice, some fixed costs are recovered through the variable charge. Fixed charges do not vary with amount of electricity consumed, or demand placed on the distribution system, by the customer, while the variable charges are based on the amount of electricity consumed, or demand placed on the distribution system, by the distributors' customers.
The fixed and variable charges are determined such that the charges multiplied by the forecast number of customers/connections and amount of electricity delivered / demand incurred would recover the total revenue requirement for the distributor for the test year that rates are being set.

## Fixed and/or Variable Standby Charges

Background

The rates design for Distribution rates including Standby charges can have a fixed and a variable component or can have only a fixed component or only a variable component. The choice of the rate design is usually based on:

- The type of costs recovered in the rates: fixed or variable;
- Keeping the rate design simple;
- Ensuring that the rate design can be implemented;

- Providing the appropriate price signal to customers.

Issue

Should the Standby rate design be based on a fixed and variable charge or just a fixed or just a variable charge?

Alternatives

The Standby rate design can be based on:

3. Only a fixed charge;
4. Only a variable charge; or
5. Fixed and variable charge.

Elenchus Recommendation

Elenchus recommends that Standby rates should have both a fixed ($/month) and a variable component ($/kW).

Rationale

Having a Standby rate design that includes both a fixed and a variable component will better reflect cost-causality and would send the proper price signal to Standby customers. This rate design will also provide consistency with other distribution rate design.

## Standby Rates Billing Quantity

Background

The billing quantity used by distributors as the basis for applying Standby rates can be based on:

- the rated capacity of the generator owned by customers with Load Displacement Generation;
- an amount agreed upon by the customer with Load Displacement Generation and the distributor (i.e. contracted demand); or
- the actual generation.

All these approaches are being used currently by distributors in Ontario that have Standby rates.

Issue

What quantity should be used when applying the Standby rate variable charge?

Alternatives

The Standby rate design can be applied to:

1. Generator rated capacity;
2. Contract quantity; or
3. Actual generation quantity.

Elenchus Recommendation

Elenchus recommends that the contracted amount should be used as a quantity for applying the Standby rate variable charge.

Rationale

Standby rates should be applied to the contracted amount assuming that this amount is determinative of the size of facilities that the distributor will have ready to supply when the customer generator is not operating. Using contract amounts for applying Standby rates should be complemented by excess demand charges in cases where the electricity needs of the customer with Load Displacement Generation exceeds the contracted amounts.

## Applying Standby Charges

Background

A customer with Load Displacement Generation may not use its own generation for a period of time for a variety of reasons, for example generator failure, planned maintenance or for economic reasons.

Issue

How should standby charges be applied by the distributor to the customers with Load Displacement Generation?

Alternatives

1. Always apply standby charges to the full contracted amount; or
2. Apply standby charges differently depending on the operation of the generation facility during the billing period.

Elenchus Recommendation

Elenchus recommends that standby rates should be applied differently depending on the operation of the generation facility during the billing period.

Elenchus recommends that a similar methodology as used by Hydro Ottawa (explanation attached as Appendix) for applying standby rates should be utilized. Note that in all the below scenarios, the regular distribution volumetric charges apply to the metered peak demand.

**Example 1 – Generation ON for entire billing period**

In this case the standby charges would be applied to the Contract Backup Demand.

**Example 2 – Generation OFF for entire billing period**

In this case the standby charges would be zero. The customer is billed based on its peak demand during the billing period according to the rate class the customer belongs to.

**Example 3 – Generation ON and OFF during billing period**

In this example the standby charges would be applied to the amount resulting from the following calculation:

Contract Back up Demand – (Metered Peak when generator OFF – Metered Peak when generator ON)

This assumes that the difference between the generator OFF peak and the generator ON peak is less than the contracted amount. If not, the customer is subject to Excess Demand Charges (discussed below).

Rationale

The proposed methodology for applying standby rates ensures that customers with LDG are only paying standby charges related to their actual standby service requirements. In the scenario where generation is on for the entire billing period, the customer with LDG pays standby charges for the entire contracted demand for standby service. In the scenario where generation is off for the entire billing period, the customer with LDG is operating as a regular distribution customer (i.e. does not own generation) and is treated as such. In the scenario where the generation is both on and off during the billing period, the customer with LDG will only pay for the standby service that they actually required during the period.

## Excess Demand Charges

Background

Excess demand charges are generally applied in instances when the amount of electricity consumed by customers exceeds the contract demand established with their distributor. Utilities that provide Standby services have to have facilities ready to supply the customer when its generator is not operating. The size of the distribution facilities are tied to the contracted demand.

Issue

Should there be a charge for excess demand in addition to Standby charges if the customer with Load Displacement Generation electricity consumption exceeds the contract amount for Standby charges?

Alternatives

Excess demand charges:

1. Yes; or
2. No.

Elenchus Recommendation

Elenchus recommends that there should be an additional charge if the demand by the customer with Load Displacement Generation exceeds its contract demand with the distributor for Standby power.

Rationale

Having an additional charge for exceeding the electricity quantity used in billing Standby charges will ensure that customers with Load Displacement Generation pay for the costs they impose on distributors for the facilities they use and are not being subsidized by other distributor's customers. It will also send the proper price signal to customers with Load Displacement Generation that the contract amounts for standby service should reflect the customer's actual electricity needs.

## Firm versus Interruptible Standby Rates

Background

A distributor may offer firm or interruptible rates. The interruptible rates would usually entail a less reliable service to the customer than firm rates. The interruption of service by the distributor could be for operational or economic reasons, e.g. if commodity and/or

transmission prices are higher than a pre-determined level. A limit on the frequency of interruptions during a specified period may be a component of the conditions of interruptible service.

Issue

Should Standby rates be firm or interruptible rates?

Alternatives

Distributors should have Standby rates that are firm or interruptible:

1. Yes; or
2. No.

Elenchus Recommendation

Elenchus recommends that there should be both firm and interruptible Standby rates to the extent that a cost differential can be determined.

Rationale

Offering both firm and interruptible Standby rates would provide choices to customers with Load Displacement Generation with respect to the quality of service they require to satisfy their own needs and would provide distributors with a way to better utilize their assets. Better utilization of assets would provide benefits to all distributors' customers in the form of higher asset utilization and therefore, lower un-utilized capacity. This may result in lower charges to all customers in the longer term.

# Appendix A

## Hydro Ottawa Application of Standby Rates

### Standby Charges

Hydro Ottawa proposed Standby Charges as part of its 2008 Rate Application. They were approved by the OEB on an interim basis. The Standby Charge applies to all customers with load displacement generators with a total combined nameplate rating greater than or equal to 500 kVA. The purpose of the Standby Charge is to recover the cost of providing reserved capacity to these customers and to eliminate cross-subsidization by other customers. Hydro Ottawa's distribution rates are designed based on the principle of continuous use. When customers displace load with generation, the expected revenue to recover capital, operating, maintenance and administration costs are not realized and the burden falls on other customers to subsidize those revenue shortfalls.

Due to the nature of Hydro Ottawa's distribution system and its embedded generators, site-specific Standby Charges are not practical. Generators are installed in very dense urban environments and determining what specific assets are related to each site is simply too difficult to assess. Hydro Ottawa is proposing to use class-specific charges instead.

### Rate Structure

The Standby Charge is composed of a standby monthly service charge for administration and a standby distribution volumetric rate based on the Contract Backup Demand as determined by the methodology outlined below:

*Standby Monthly Service Charge* – A monthly fixed charge applied to cover the incremental cost of monitoring, billing and administration related to providing standby facilities.

*Standby Distribution Volumetric Rate* – A rate per kW or kVA of Billed Backup Demand.

The Billed Backup Demand quantity will be equal to or less than the Contract Backup Demand depending on whether the reserved capacity was required during the billing period. The standby distribution volumetric rate would be equal to the class-specific distribution volumetric rate.

### Customer Classification

The rate classification of customers with load displacement generators will be net of the connected generation. The 12-month average demand used to determine customer classifications will be the demand based on meter readings.

**Contract Backup Demand**

The Contract Backup Demand can be determined by using the full nameplate value of the generating plant or a lesser amount as agreed to by the customer and Hydro Ottawa. The customer can elect to contract for a lesser amount if it intends to shed load when the generation is not available. This will reduce the customer's monthly cost but may expose them to the Backup Overrun Adjustment if the contracted amount is exceeded. If a customer determines that no backup capacity is required, it must still sign a Standby Facilities Contract indicating that it has elected not to contract for backup capacity. Backup Overrun Adjustments will be applied if the customer is forced to use standby capacity for which it has not contracted. Hydro Ottawa reserves the right to impose a Contract Backup Demand if a customer fails to meet its obligations.

**Determination of Billed Backup Demand**

The Contract Backup Demand establishes a ceiling for Billed Backup Demand (excluding Backup Overrun Adjustments). The following three examples illustrate how the volumetric component of the Standby Charge is determined. The examples that follow assume that the regular distribution volumetric charges apply to the metered peak demand. The Standby Charge is intended to supplement demand shortfalls introduced by the generation.

*Example 1 – Generation ON for entire period*

In this case the Billed Backup Demand would be equal to the Contract Backup Demand. The Contract Backup Demand replaces demand that would have been captured by Hydro Ottawa's interval metering had the generation been off.

*Example 2 – Generation OFF for entire period*

In this case the Billed Backup Demand would be zero. The customer is billed based on the peak demand registered on Hydro Ottawa's interval meters.

*Example 3 – Generation ON and OFF during period (No Backup Overruns)*

In this example the Billed Backup Demand is:

Contract Demand – (Metered Peak generator OFF – Metered Peak generator ON)

This assumes that the difference between the generator OFF peak and the generator ON peak is less than the contracted amount; if not, the customer is subject to a Backup Overrun Adjustment.

**Backup Overrun Adjustment**

The Backup Overrun Adjustment is to ensure customers contract for the appropriate amount of standby capacity. Customers must meet contract requirements by shedding load if they have contracted for an amount less than the nameplate rating. The Backup Overrun Adjustment is calculated as follows:

(Generator OFF Peak – Generator ON Peak) – Contract Backup Demand

If the Contract Backup Demand is less than the difference between the two peaks, a charge will apply.

Backup Overrun Adjustments are determined by reviewing interval data prior to and immediately after a generator change-of-status. The instantaneous demand difference with the generator on and off is determinative of the standby capacity used and any overrun used. The Backup Overrun Adjustments never exceed the nameplate rating of the generating plant; consequently, the Backup Overrun Adjustment only applies to customers that have contracted for Backup Demand less than the generator nameplate rating.

Contract Backup Demand is reviewed on a quarterly basis. If a customer has exceeded the Contract Backup Demand (Backup Overrun Adjustment) in any of the three preceding billing periods, the Contract Backup Demand will be increased to the highest monthly level of utilization that occurred in those three months.

The Backup Overrun Adjustment is assessed at the same rate as the Billed Backup Demand.