

APPENDIX C

DOCUMENTATION

RATE UNBUNDLING AND DESIGN MODEL

This Model is designed to do all of the calculations necessary to unbundle distribution rates. For ease of use, the Model has been divided into a number of sub-sheets (tabs) for major sections of the calculations.

SUBSHEET#1: DATA

The first sub-sheet contains most of the data that is required for input into the Model. The Model requires a minimum of input by the user and the necessary data input areas are highlighted in yellow. If your utility has no customers in any of these classes, please be sure to enter zeros in the relevant cells.

Please note that the retail energy values for most of the rate classes or groups are automatically determined by adding the amounts input in the RATE CLASS REVENUE REQUIREMENTS AND DISTRIBUTION CHARGES CALCULATIONS portion of the subsheet.

The data required should be for year-end 1999 (12-months data) as contained in your files. The number of customers should be the number on record at year-end 1999. Rates information should be those on the current approved rate schedules.

SUBSHEET#2: BACKGROUND INFORMATION

The analysis starts with the retail energy (kWh) for each rate class and three groups of the General Service class (time of use, under 50 kW, and intermediate use) . It is also necessary to specify a loss adjustment factor which is defined as the most recent 5-year average utility distribution system loss factor (DSL). Please note that this factor is calculated from retail to wholesale, not the usual wholesale to retail. For utilities with large use customers, the kWh associated with this class should be removed in determining the loss factor. For large use customers, the loss factor is assumed to be 1.0 percent. If it is more appropriate, a utility can also use the DSL for the large use class instead of the default 1.0 per cent loss factor.

The Model presented in this section multiplies retail energy by the loss adjustment factor to determine the wholesale energy amounts. It then applies the coincident load factors and energy weighting factors (Ontario Hydro 1980) to the wholesale amounts to determine coincident peak demand (kW) for the winter (Oct-Mar) and summer (Apr-Sept) periods and wholesale energy amounts (kWh) for the winter and summer peak and off-peak time periods for each rate class. These calculated amounts form the basis for the cost of power calculations which follow in the COST OF POWER CALCULATIONS (SUBSHEET#3).

SUBSHEET#3: COST OF POWER CALCULATIONS

The wholesale volumes are multiplied by the wholesale power rates to determine the cost of power for each rate class. Since actual billing data is available for general service time of use, intermediate use and large use customers, this data is used instead of the estimates calculated by the Model. The data for these classes must be entered in the indicated sections of SUBSHEET#1.

Since the Model relies on estimated volumes for most of the rate classes, the resulting cost of power may not add up to the utility's actual cost of power. To correct for this, the Model automatically reconciles the calculated cost of power to the actual cost of power before any diversity adjustment (the latter is to be input in the indicated cell in SUBSHEET#1). Adjustments are made in proportion to the calculated amounts for the subclasses. No adjustments are made for the general service time of use, intermediate and large use classes as actual data is used as input. The required adjustments are then proportionately allocated across time periods within each rate class.

For those utilities with local generation, there is an additional step to the cost of power calculations (LOCAL GENERATION COP ADJUSTMENT). First, the cost of local generation is calculated. All of the required data for the cost calculation must be entered into the appropriate cells of the Model, together with the amount of purchased and locally generated energy (kWh). The Model then calculates a weighted cost of power and adjusts the purchased cost of power to arrive at a weighted cost of power which incorporates local generation costs. Adjustments are made in proportion to the class shares of the purchased cost of power and adjustments to time periods within classes are also made proportionately.

SUBSHEET#4: REVENUE REQUIREMENTS & DISTRIBUTION CHARGES

The next step in the Model is to calculate the revenue requirements for each rate class at existing rates. Data on sales and block rates are obtained from the values entered for each rate class or group in SUBSHEET#1. Sales data in each class should equal the retail amounts used for the cost of power calculations.

The Model will then calculate the unbundled distribution rates. The distribution volumetric rate as energy (kWh) and demand (kW) rates is calculated. In addition, the monthly distribution service charge is calculated.

SUBSHEET#5: SUMMARY OF RATES AND CHARGES

A summary table of the rates and service charges calculated in SUBSHEET#4, together with the cost of power rates is included in this section.

SUBSHEET#6: RATE IMPACT ANALYSIS

This section of the Model performs a rate impact analysis of the unbundled rates versus existing rates. This provides information on the impact of the change in rate structure on customers at various consumption levels in each rate class. All of the calculations are done automatically using information previously used by the Model although provision has been made to allow entry of consumption (demand and energy) levels differing from those that have been pre-formulated.

SUBSHEET#7: MBRR (NO PILS) CALCULATIONS **and**
SUBSHEET#8: MBRR (WITH PILS) CALCULATIONS

The market base rate of return (MBRR) calculations are done in two stages as payments in lieu of taxes (“PILS”) do not come into effect until market opening. SUBSHEET#7 calculates MBRR without PILS. The revised distribution kW or kWh rates and the monthly service charge for each rate class are also calculated. SUBSHEET#8 calculates MBRR with PILS incorporated for the whole year. The difference between the two MBRR values represents the amount that rates have to increase after market opening to allow for PILS.

The level of rate of return up to the market based rate of return used is at the discretion of the utility. Data for calculating the return must be input into the appropriate cells. The additional revenue required under a rate of return greater than at the current rates is allocated between variable revenue and monthly service charge revenue in proportion to their relative shares as calculated for unbundled rates. The cost of power kW and kWh rates are not affected by the change in rate of return level.

**SUBSHEET#9: RATE SUMMARY (NO TAX) and
SUBSHEET#10: RATE SUMMARY (WITH TAXES)**

These subsheets provide a summary of the rates and service charges calculated in SUBSHEETS #7 and #8, together with the cost of power rates.

SUBSHEET#11: RATE IMPACT ANALYSIS AFTER MBRR

This section performs a rate analysis of the unbundled rates with MBRR versus existing rates in a similar fashion to the impact analysis included in SUBSHEET#6.

**SUBSHEET#12: SENSITIVITY ANALYSIS 1
SUBSHEET#13: SENSITIVITY ANALYSIS 2
SUBSHEET#14: SENSITIVITY ANALYSIS 3**

These sections of the spreadsheet are designed to allow you to vary the percentages of variable charge and service charge revenues in each of the rate classes or groups used in the earlier subsheets to assess the rate impacts from rate design. SUBSHEET#12 is for unbundled rates prior to the MBRR adjustment, SUBSHEET#13 is for MBRR prior to market opening (ie. no PILS) and SUBSHEET#14 is for MBRR after market opening (ie. with PILS).

To use this portion of the Model, enter the calculated distribution revenue value for each rate class or group from SUBSHEET# 4 and a value for the variable charge revenue proportion. The variable charge revenue proportion level that is chosen can vary between rate classes and groups. The Model will then calculate new distribution volumetric rates (\$/kWh or \$/kW) and monthly service charges for each class or group and perform a rate impact analysis.

This analysis can be repeated by changing the volumetric charge proportion. Please make note of the results after each iteration as the Model does not maintain a record of the results from one iteration to the next.

The proportions of variable and service charge revenues calculated for each rate class or group in SUBSHEET#4 provide the starting point for this analysis. The variable revenue proportion may be revised upward but cannot go below the starting point level. The proportion chosen must be used for all consumption levels in the rate class or group, i.e. you cannot use one proportion level for low end consumers and a different one for consumers at the higher end.

SUBSHEET#15: RATE SCHEDULE (NO MBRR)

SUBSHEET#16: RATE SCHEDULE (MBRR)

These subsheets automatically provide a schedule of the rates and charges calculated in the previous section.

NOTE: During testing of the Model, it was noted that the distribution revenue for street lighting for some of our test utilities (SUBSHEET#4) resulted in negative values for reasons we could not ascertain. If this happens for your utility, consider the following suggestion as a means to overcome the difficulty:

- 1) Add the total revenue for the general service <50 kW and general service >50 kW together. Do the same for distribution revenue. Then calculate the percentage share of the distribution revenue to total revenue.
- 2) Apply this percentage to the total annual revenue for street lighting to determine the distribution revenue for this class and proceed with the rest of the original calculation methodology. You will have to adjust the rates to reflect the amount of the calculated distribution revenue.
- 3) To remain revenue neutral overall, you will then have to subtract the distribution revenue amount from the total revenue requirements for the <50 kW and >50 kW groups and adjust rates for these groups accordingly.