

Section:	PCOSS14-Amended (filed with COSS Model)	Page No.:	Schedule E1
Topic:	Direct Assignment		
Subtopic:	Lighting		
Issue:			

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a) Please explain what the Generation Interest, Depreciation and Operating costs directly assigned to Street Lights are related to and how they were determined.
- b) Please explain what the Distribution Interest, Depreciation and Operating costs directly assigned to Lighting are related to and how they were determined.

RATIONALE FOR QUESTION:

To understand the direct assignment of cost to Lighting customers.

RESPONSE:

- a) The Generation costs directly assigned to Area and Roadway Lighting represent the cost of DSM programs. Since the revenue requirement for PCOSS14-Amended does not include any costs related to the LED Streetlight Conversion, the only costs assigned to A&RL were a portion of the DSM Support Activity costs. These activities are not directly attributable to a specific DSM program or customer class and are assigned to domestic classes based on the allocator used for Generation costs, which in the case of A&RL results in an assignment of 0.37 percent of costs.
- b) The Distribution Interest and Depreciation costs directly assigned to A&RL are related to the capital cost of dedicated end-use facilities including street light standards, posts, arms & brackets, lamps & luminaires, automatic control equipment such as photo-electric

sensors, relays and switches, and conductor dedicated to street lighting. Also included with these costs are a share of Interest and Depreciation on buildings and general equipment.

Operating costs are for maintenance and repair of these dedicated facilities, and include activities such as bulb replacements, trouble/outage responses, standards painting, inspections, and other routine maintenance.

Operating costs and assets that are directly assigned to A&RL are tracked at the cost center level in SAP.

Section:	COSS Model PCOSS14-Amended (filed with COSS Model)	Page No.:	Worksheet C Tables Table C10 (rows 1- 35) Schedule E
Topic:	Allocation		
Subtopic:	Customer Service		
Issue:			

PREAMBLE TO IR (IF ANY):

QUESTION:

- Please confirm that the table “C10” in the COSS Model, Worksheet labelled “C Tables” is used to allocate the costs reported on Schedule E, Dist Serv – Cust Service – General, or explain which costs, if any are allocated by this allocator.
- Please explain the nature of the costs reported on Schedule E, Dist Serv – Cust Service – General, or other costs allocated by the C10 allocator.
- Please explain the derivation of the weighting factors used in the Excel COSS model, Worksheet C Tables, Table C10 (rows 1-35), column D.

RATIONALE FOR QUESTION:

To understand the derivation and use of the C10 allocator.

RESPONSE:

- Confirmed.

Response to parts b) and c):

Please see Manitoba Hydro’s response to MIPUG/MH I-4.

Section:	COSS Model PCOSS14-Amended (filed with COSS Model)	Page No.:	Worksheet C Tables Table C11 (rows 39- 73) Schedule E
Topic:	Allocation		
Subtopic:	Customer Acct - Billings		
Issue:			

PREAMBLE TO IR (IF ANY):

QUESTION:

- Please confirm that the table “C11” in the COSS Model, Worksheet labelled “C Tables” is used to allocate the costs reported on Schedule E, Dist Serv – Cust Acct – Billings, or explain which costs, if any are allocated by this allocator.
- Please explain the nature of the costs reported on Schedule E, Dist Serv – Cust Acct – Billings, or other costs allocated by the C11 allocator.
- Please explain the derivation of the weighting factors used in the Excel COSS model, Worksheet C Tables, Table C11 (rows 39-73), column C.

RATIONALE FOR QUESTION:

To understand the derivation and use of the C11 allocator.

RESPONSE:

- Confirmed.
- ‘Distribution Services – Customer Accounting: Billings’ includes the costs related to Manitoba Hydro’s billing function, and a share of corporate administrative and general costs. Billing function costs include; Banner, bill printing, postage, cash audits,

eCampaign maintenance, payment processing bill inserter operations, as well as billing-related labour and associated overhead from the Customer Billing Department, the Contact Center, Rates, Field Staff, and IT (CIS Training, Banner support, Banner maintenance, and Banner enhancements).

- c) The weighting column was added to the electronic model for the current Cost of Service Review to allow stakeholders to test different weighting factors. Class weightings were back-calculated based on customer count to match the allocators shown in the model of PCOSS14-Amended. The weight indicated for Area & Roadway Lighting in the model is neither the Sentinel and Street Lighting weights, but a combination of the two weighting factors.

The following schedule provides the determination of the weighted customer count used in PCOSS14-Amended. The weighting factors used to allocate the billing and collection costs are taken from a 1991 study of customer accounting costs. The cost of providing each accounting function for each customer class was divided by the number of accounts for the class to find the cost to serve each account in the class. The unit cost is applied as a weighting factor to the 2014 forecast number of accounts to determine the share of forecast costs attributable to each customer class. For presentation purposes in the tables in the Cost of Service Study, the allocators are shown relative to a base of ten thousand. In the case of A&RL historic average lights per bill are used in conjunction with the forecast number of lights to determine the accounts for 2014.

Source: Obtained from 1991 Cost of Service Cost Allocation - Summary

Source:

I	J		
8,656,732	3,735,265	10,000	10,000

Section:	COSS Model PCOSS14-Amended (filed with COSS Model)	Page No.:	Worksheet C Tables Table C23 (rows 39- 73) Schedule E
Topic:	Allocation		
Subtopic:	Dist Plant – Lines		
Issue:			

PREAMBLE TO IR (IF ANY):

QUESTION:

- Please confirm that the table “C23” in the COSS Model, Worksheet labelled “C Tables” is used to allocate the costs reported on Schedule E, Dist Plant – Lines, or explain which costs, if any are allocated by this allocator.
- Please explain the nature of the costs reported on Schedule E, Dist Plant – Lines, or other costs allocated by the C23 allocator.
- Please explain the derivation of the weighting factors used in the Excel COSS model, Worksheet C Tables, Table C23 (rows 367-301), column C.
- Please explain the significance and purpose of the numbers in the formula in cell E294 “=ROUND((((7529/6)+(121522/10))*C294),0)”.

RATIONALE FOR QUESTION:

To understand the derivation and use of the C23 allocator.

RESPONSE:

- Confirmed.

- b) C23 allocates the 40% of Distribution Poles and Wires costs that are Classified as Customer-related in PCOSS14-Amended. For a detailed breakdown of the plant-related costs included in the function, please see Manitoba Hydro's response to GAC/MH I-17.
- c) The weighting factor in Column C of the electronic version of PCOSS14-Amended is a specific adjustment to recognize the use of secondary distribution by street lighting and GSL<30 kV customers. Please see Manitoba Hydro's response to COALITION/MH I-50f and COALITION/MH I-73.
- d) The street light customer count in the PCOSS reflects the estimated number of taps into the distribution system that would be required if the lights were connected in a series through a relay. The calculation assumes that there are six lights per tap for lights greater than 250W and 10 per tap for 250W and less. In PCOSS14-Amended the forecast street light count includes 7,529 fixtures greater than 250W and 121,522 at 250W and below.
- e) Please see Manitoba Hydro's response to COALITION/MH I-73c for a discussion of the adjustment for secondary distribution used for A&RL.

Section:	COSS Model	Page No.:	Worksheet Detail Column I
Topic:	Allocation		
Subtopic:	Dist Plant		
Issue:			

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a) Please describe the CP Load Factor in terms of its meaning, and application in calculating CP Demand.
- b) Many entries in the column CP Load Factor are data entries. Please provide the derivation of these values.

RATIONALE FOR QUESTION:

To understand the calculation of the Coincident Peak allocator from the Energy information.

RESPONSE:

- a) In the Detail tab of the “Energy and Demand Allocators.xlsx” model provided on March 11, 2016, the CP Load Factor used is based on the top 50 annual domestic peak hours and is calculated as Class Metered Energy/(Class Metered CP Demand x Hours). The CP demand at the customer meter is then estimated for the forecast period by applying the CP Load Factor to the forecast kWh sales at meter in combination with annual hours.

CP demand at the time of domestic peak was used to allocate Generation and Transmission costs prior to the inclusion of an Export class into the COSS, and has not been used as an allocator in PCOSS14-Amended.

- b) The calculation of the average CP Load Factors are provided in Manitoba Hydro's response to PUB/MH I-5a.

Since Area and Roadway Lighting is unmetered and has a predictable load profile, they have not been included in load research studies. The CP Load Factor and Coincidence Factor for this class is based on load research results for 1997/98 in PCOSS14-Amended. Since the preparation of PCOSS14, Manitoba Hydro has now included Area & Roadway Lighting in Load Research studies. The Area and Roadway Lighting class load profile is estimated by aggregating the total of all luminaries including bulb and ballast energy consumption. Sunset and sunrise times are at Winnipeg. Photo cell response time is assumed to coincide with sunset and sunrise. The table below provides the 2012/13 and 2013/14 load research results for the Area and Roadway Lighting Class which will be applied to future cost of service studies.

Study	CP Load Factor	Coincidence Factor	NCP Load Factor
2012/13	78.2%	62.4%	48.8%
2013/14	86.4%	56.6%	48.9%

Section:	COSS Model	Page No.:	Worksheet Detail Column T
Topic:	Allocation		
Subtopic:	Dist Plant		
Issue:			

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a) Please describe the Class Coinc. Factor in terms of its meaning, and application in calculating CP Demand.
- b) Many entries in the column Class Coinc Factor are data entries. Please provide the derivation of these values.

RATIONALE FOR QUESTION:

To understand the calculation of the NCP allocator from Coincident Peak allocator.

RESPONSE:

- a) In the Detail tab of the “Energy and Demand Allocators.xlsx” model provided on March 11, 2016, the Class Coincident Factor is based on the top 50 annual domestic peak hours and is calculated as Class Metered CP Demand/Class Metered NCP Demand. The NCP demand at the customer meter is then estimated for the forecast period by applying the CF to the forecast class CP demand at meter.
- b) Please see Manitoba Hydro’s response to COW/MH I-5.

Section:	Derivation of Energy Weights for PCOSS14 (supplied with COSS Model) Energy and Demand Allocators PCOSS14 (also supplied with COSS Model) COSS Model	Page No.:	Weightings worksheet, rows 24-41 Forecast Weighted Energy worksheet
Topic:	Allocation		
Subtopic:	Energy Weights		
Issue:			

PREAMBLE TO IR (IF ANY):

The worksheet “Weightings” in the Excel spreadsheet “Derivation of Energy Weights for PCOSS14” (supplied March 11th with the COSS Model) identifies that a correction was made to this sheet for Fall/Winter, and weights used in the PCOSS14-Amended do not reflect the correction.

QUESTION:

- a) Please update the COSS Model to reflect the corrected Hour Weighted Average Price and Marginal Cost Weighting.

RATIONALE FOR QUESTION:

To understand the impacts of corrected allocators.

RESPONSE:

Please see Manitoba Hydro’s response to GAC/MH I-55 and GAC/MH I-56a-d.

Section:	Energy and Demand Allocators PCOSS14 (supplied with COSS Model)	Page No.:	Energy Consumption by Period worksheet
Topic:	Allocation		
Subtopic:	Energy Consumption Information		
Issue:			

PREAMBLE TO IR (IF ANY):**QUESTION:**

- Please explain the methodology for deriving the percentage splits by season and Time of Use categories.
- For each rate class, please describe the type of data used – e.g. Appliance saturation surveys, meter data, deemed consumption, etc.
- Which years of data were contained in the sample?
- Was weather normalization performed on the data? If so, how?

RATIONALE FOR QUESTION:

To understand the calculation of the energy allocators.

RESPONSE:

- Load Research studies provide annual estimates of actual class energy consumption by season and in each of the 12 Time-of-Use periods. The class energy consumed in each season and period is converted to a percentage of annual energy used, which are then averaged for the eight years of Load Research studies used in the PCOSS.

For the 2012/13 and 2013/14 Load Research studies, the Area and Roadway Lighting (A&RL) class load profile is estimated by aggregating the total of all luminaires including bulb and ballast energy consumption. Sunset and sunrise times are at Winnipeg. Photo cell response time is assumed to coincide with sunset and sunrise. Hourly kW demand estimates are full load, no load or partial load if crossing sunset or sunrise times. The seasonal and 12 Period TOU energies shown are aggregations of the estimated hourly loads over the period shown.

- b) Please see response to part a).
- c) PCOSS14-Amended includes the average of eight years of Load Research from 2004/05 to 2011/12.
- d) Weather normalization was not performed on the data, however, the use of the average of results from eight Load Research studies smoothes and moderates weather related influences on energy consumption patterns.

Section:	Energy and Demand Allocators PCOSS14 (also supplied with COSS Model)	Page No.:	Detail worksheet, column B
Topic:	Load Forecast		
Subtopic:	Forecast # Cust		
Issue:			

PREAMBLE TO IR (IF ANY):

The Detail worksheet on the Energy and Demand Allocators worksheet uses hard-coded forecast values

QUESTION:

- a) Is the connection count forecast entered into Column B of the Detail worksheet, a forecast for the 2014 test year, or the actual historic count for 2014? If neither, please identify.
- b) How was the count of street light connections determined?
- c) In what year was the data last updated?
- d) What are the plans for updating and keeping the information current?
- e) How will updated information be reflected in the next GRA?
- f) Will the conversion to LED technology result in an accurate count of streetlights?

RATIONALE FOR QUESTION:

To understand the forecast information used.

RESPONSE:

- a) The Detail worksheet includes forecast fixture count for Street and Sentinel Lighting based on the actual street light inventory as at April 30, 2012 plus the projected additions to March 31, 2014.
- b) The Street Lighting connection count reflects the number of taps into the distribution system that would be required if the lights were connected in a series through a relay. The factor varies with changes in street light fixture count, as it assumes six lights per tap for greater than 250 Watt fixtures and ten per tap for 250 Watt and less.

A further adjustment is made to recognize that customer costs of the secondary distribution system should not be allocated to street lights since some lights will already include the cost of dedicated secondary and since they are already allocated demand costs associated with the secondary system.

The calculation of the adjustment using data from PCOSS14-Amended is as follows:

	Forecast Fixtures	Adjustment Based on Wattage	Number of Connections if Connected in Series
>250 Watt (nominal)	7,529	6	1,255
250 Watt and less (nominal)	121,522	10	12,152
Total Connections			13,407
Secondary Adjustment (42%)			(5,361)
Street light Connections in C13 Allocator			7,776

- c) The actual street light fixture count is updated annually. The forecast street light fixture count and estimate of connections is updated for each Cost of Service study.
- d) The Banner billing system is the data source for the Energy and Demand Allocators worksheet. Data in the Banner billing system is maintained by way of the following processes. Streetlight maintenance staff provides Connect/Disconnect reports to the billing system staff after the completion of changes to street lights. LED conversion contractors use an automated process to update converted Area & Roadway Lighting in

Manitoba Hydro's Enterprise Geographic Information System (eGIS). The data updated in eGIS is used to update Banner.

Manitoba Hydro will address process changes and improvements, as appropriate, in the course of undertaking its Area & Roadway Lighting Reconciliation Plan.

- e) Area and Roadway lighting counts will continue to be obtained from the Banner billing system in preparation for future GRAs.
- f) As outlined in Manitoba Hydro's Area & Roadway Lighting Reconciliation Plan, the Corporation will address the concerns regarding Area & Roadway Lighting inventory and related billing issues through three separate but related processes. These include the LED Conversion Program, case by case identification and resolution, and a reconciliation of the eGIS inventory with the billing system.

Section:	Energy and Demand Allocators PCOSS14 (also supplied with COSS Model)	Page No.:	Detail worksheet, column C
Topic:	Load Forecast		
Subtopic:	Forecast Total kWh		
Issue:			

PREAMBLE TO IR (IF ANY):

The Detail worksheet on the Energy and Demand Allocators worksheet uses hard-coded forecast values

QUESTION:

- a) Is the energy forecast entered into Column C of the Detail worksheet, a prospective forecast for the 2014 test year, or the retrospective energy estimate for 2014?
- b) Is the forecast weather normalized or weather actual?
- c) What measures are taken to ensure that the load forecast reflects the test year when changes in load are occurring or anticipated to occur prior to the end of the test year?
- d) How would the street light load forecast reflect the planned or on-going conversion to LED technology?

RATIONALE FOR QUESTION:

To understand the forecast information used.

RESPONSE:

- a) The energy included in the “Detail” worksheet in the “Energy and Demand Allocators PCOSS14 (Amended).xlsx” document provided on March 11, 2016, is a prospective forecast for the 2014 test year.

- b) As per the Load Forecast, the forecast is weather adjusted for those sectors whose major variation is due to weather. Sectors that vary primarily due to industrial output levels or seasonal but non-weather reasons may yield false weather effects if estimated. Weather effects are not determined for the GS Top Consumers, Seasonal, Diesel, Water Heating and Lighting Sectors.
- c) Manitoba Hydro prepares the Electric Load Forecast and Demand Side Management Power Smart Plan annually taking into account the latest information and technology that will impact the future electrical consumption in Manitoba known at the time of the creation of each respective document.
- d) PCOSS14 is based on the 2012 Electric Load Forecast and the 2012 Power Smart Plan in which there were no anticipated Demand Side Management initiatives regarding the Street Lighting conversion to LED technology. Demand Side Management initiatives related to the Street Lighting conversion to LED technology were introduced and reflected in the 2014 Power Smart Plan (15 year supplemental report).