

# **EXHIBIT 7: COST ALLOCATION**

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1 **Exhibit 7: Cost Allocation Overview**

2 **2.7.1 Cost Allocation Study Requirements**

3 In this application, PUC Distribution has used the 2018 version of the cost allocation model  
4 released by the OEB on July 14, 2017. The model has been loaded with 2018 test year costs,  
5 customer numbers and demand values for PUC Distribution. The 2018 demand values were  
6 based on the 2018 weather normalized load forecast used to design rates. The various weighting  
7 factors used in the 2018 study have been updated and explained below.

8 *Weighting Factors*

9 PUC Distribution has developed weighting factors as outlined below based on discussions with  
10 staff experienced in the subject area. Labour, materials and outside costs required to perform the  
11 specific tasks below were estimated to determine each rate class factor. PUC Distribution  
12 assigned a weighting factor of 1 to the Residential rate class and further calculated the associated  
13 weighting factors for the remaining rate classes.

14 *Services (Account 1855)*

15 **Table 7-1: Service Weighting Factors**

<b>Rate Class</b>	<b>Factor</b>
Residential	1.0
General Service < 50 kW	0.7
General Service 50 to 4,999 kW	0.4
Sentinel Lighting	0.05
Street Lights	0.05
Unmetered Scattered Load	0.05

16

1 *Billing and Collection (Accounts 5315 – 5340, except 5335)*

2 **Table 7-2: Billing Weighting Factors**

Rate Class	Factor
Residential	1.0
General Service < 50 kW	1.1
General Service 50 to 4,999 kW	4.0
Sentinel Lighting	0.8
Street Lights	0.8
Unmetered Scattered Load	0.8

3  
4 *Meter Capital (Sheet I7.1)*

5 **Table 7-3: Meter Capital Installation Costs**

Meter Type	Installation Cost per Meter
Smart Meter - Residential	\$205
Smart Meter - General Service < 50 kW	\$587
Smart Meter - General Service 50 to 4,999 kW	\$1,006

6  
7 *Meter Reading (Sheet I7.2)*

8 **Table 7-4: Meter Reading Weighting Factor**

Meter Type	Factor
Smart Meter - Residential	1.0
Smart Meter - General Service < 50 kW	1.0
Smart Meter - General Service 50 to 4,999 kW	19.81

9  
10

1 *Summary of Results and Proposed Changes*

2 The data used in the updated cost allocation study is consistent with PUC Distribution's cost data  
3 that supports the proposed 2018 revenue requirement outlined in this application. PUC  
4 Distribution's assets were broken out into primary and secondary distribution functions using  
5 breakout percentages used in PUC Distribution's 2013 cost of service rate application (EB-2012-  
6 0162). The breakout of assets, capital contributions, depreciation, accumulated depreciation,  
7 customer data and load data by primary, line transformer and secondary categories were  
8 developed from the best data available to PUC Distribution, its engineering records, and its  
9 customer and financial information systems. An Excel version of the updated cost allocation  
10 study has been included with the filed application material. In addition, Appendix 1 outlines  
11 Input Sheets I-6 & I-8 and Output Sheets O-1 & O-2 (first page only).

12 Capital contributions, depreciation and accumulated depreciation by USoA are consistent with  
13 the information provided in the 2018 continuity statement shown in Exhibit 2. The rate class  
14 customer data used in the updated cost allocation study is consistent with the 2018 customer  
15 forecast outlined in Exhibit 3.

16 The load profiles for each rate class are the same as those used in the 2013 study but have been  
17 scaled to match the 2018 load forecast. In a letter, dated June 12, 2015, the OEB stated that it  
18 expected distributors to be mindful of material changes to load profiles and to propose updates in  
19 their respective cost of service applications when warranted. PUC Distribution is not aware of  
20 any reason for the load profiles to have materially changed between the classes. As a result, PUC  
21 Distribution has not updated its load profiles at this time. PUC Distribution intends to put plans  
22 in place to update its load profiles prior to its next cost of service application.

23 PUC Distribution proposes to use the same method as was used in the 2013 Cost of Service  
24 application for PUC Distribution to determine the demand data for the 2018 cost allocation  
25 model. This method involves applying a scaling factor to the 2013 demand data in the 2013 cost  
26 allocation model to determine the 2018 demand data for cost allocation. The scaling factor  
27 represents by class the percentage of 2018 weather normalized volumes compared to the 2013

1 weather normalized volumes. The scaling factors used to estimate the 2018 demand data for the  
 2 2018 cost allocation model are shown below in Table 7-5.

3 **Table 7-5 Load Profiling Scaling Factors**

Rate Class	2013 Weather Normal Values (kWh)	2018 Weather Normal Values (kWh)	Scaling Factor
Residential	340,561,449	296,393,596	87.0%
General Service < 50 kW	102,179,766	94,320,130	92.3%
General Service 50 to 4,999 kW	251,632,820	248,349,153	98.7%
Sentinel Lighting	254,165	218,403	85.9%
Street Lights	7,907,160	2,415,793	30.6%
Unmetered Scattered Load	872,889	1,176,822	134.8%
Total	703,408,249	642,873,897	91.4%

4  
 5 The allocated cost by rate class for the 2013 Cost of Service filing and the 2018 updated study  
 6 are provided in the following Table 7-6.

7 **Table 7-6: Allocated Cost –**  
 8 **(Consistent with RRWF, Tab 11 Cost Allocation, Allocated Costs)**

Rate Class	2013 Board Approved Cost Allocation Study	%	2018 Cost Allocation Study	%
Residential	\$11,580,870	61.5%	\$14,193,143	64.3%
General Service < 50 kW	\$2,673,048	14.2%	\$3,048,990	13.8%
General Service 50 to 4,999 kW	\$3,475,269	18.4%	\$4,543,021	20.6%
Sentinel Lighting	\$45,301	0.2%	\$46,411	0.2%
Street Lights	\$1,033,492	5.5%	\$204,002	0.9%
Unmetered Scattered Load	\$33,369	0.2%	\$45,677	0.2%
Total	\$18,841,349	100.0%	\$22,081,245	100.0%

1 PUC Distribution is not proposing an Embedded Distributor rate class (PUC Distribution is not a  
2 host to any other distributor), Standby Rates (PUC Distribution will await the OEB's new rate  
3 policy for commercial customers, once implemented), or a Large Use Class (no customers are  
4 forecasted for this class in the test year).

5 *Unmetered Loads*

6 PUC Distribution communicates with unmetered load customers, including Street Lighting  
7 customers, to assist them in understanding the regulatory context in which distributors operate  
8 and how it affects unmetered load customers. This communication takes place on an on-going  
9 basis and is not driven by the rate application process.

10 *microFIT Class*

11 PUC Distribution is not proposing to include microFIT as a separate class in the cost allocation  
12 model in 2018. PUC Distribution understands that the cost allocation model will produce a  
13 calculation of unit costs which the OEB will use to update the uniform microFIT rate at a future  
14 date.

15 **2.7.1.1 New Customer Class**

16 PUC Distribution is not proposing to include a new customer class.

17 **2.7.1.2 Eliminated Customer Class**

18 PUC Distribution is not proposing to eliminate a rate class.

**2.7.2 Class Revenue Requirements**

The following Table 7-7 provides information on calculated class revenue. The resulting 2018 proposed base revenue will be the amount used in Exhibit 8 to design the proposed distribution charges in this application.

**Table 7-7 Calculated Class Revenue –**  
**(Consistent with RRWF, Tab 11 Cost Allocation, Calculated Class Revenues)**

Rate Class	2018 Base Revenue at Existing Rates	2018 Proposed Base Revenue Allocated at Existing Rates Proportion	2018 Proposed Base Revenue	Miscellaneous Revenue
Residential	\$9,084,381	\$11,172,059	\$11,487,469	\$1,567,716
General Service < 50 kW	\$2,640,479	\$3,247,287	\$3,247,287	\$323,010
General Service 50 to 4,999 kW	\$3,797,584	\$4,670,305	\$4,670,305	\$441,680
Sentinel Lighting	\$29,086	\$35,771	\$35,771	\$8,392
Street Lights	\$420,382	\$516,990	\$203,298	\$41,505
Unmetered Scattered Load	\$39,984	\$49,173	\$47,454	\$7,358
Total	\$16,011,897	\$19,691,584	\$19,691,584	\$2,389,661

**2.7.3 Revenue-to-Cost Ratios**

The results of a cost allocation study are typically presented in the form of revenue to cost ratios. The ratio is shown by rate classification and is the percentage of distribution revenue collected by rate classification compared to the costs allocated to the classification. The percentage identifies the rate classifications that are being subsidized and those that are over-contributing. A percentage of less than 100% means the rate classification is under-contributing and is being subsidized by other classes of customers. A percentage of greater than 100% indicates the rate classification is over-contributing and is subsidizing other classes of customers.

In the March Board Report, the Board established what it considered to be the appropriate ranges of revenue to cost ratios which are summarized in Table 7-8 below. In addition, Table 7-8



1 provides PUC Distribution’s revenue to cost ratios from the 2013 application, the updated 2018  
 2 cost allocation study and the proposed 2018 to 2020 ratios.

**Table 7-8 Revenue to Cost Ratios –**  
**(Consistent with RRWF, Tab 11 Cost Allocation, Proposed & Rebalancing**  
**Revenue to Cost Ratios)**

Rate Class	2013 Board Approved Cost Allocation Study	2018 Cost Allocation Study	2018 Proposed Ratios	2019 & 2020 Ratios	OEB Targets Min to Max	
Residential	92.7%	89.8%	92.0%	92.0%	85.0%	115.0%
General Service < 50 kW	113.4%	117.1%	117.1%	117.1%	80.0%	120.0%
General Service 50 to 4,999 kW	119.5%	112.5%	112.5%	112.5%	80.0%	120.0%
Sentinel Lighting	83.0%	95.2%	95.2%	95.2%	80.0%	120.0%
Street Lights	82.3%	273.8%	120.0%	120.0%	80.0%	120.0%
Unmetered Scattered Load	100.1%	123.8%	120.0%	120.0%	80.0%	120.0%

7  
 8  
 9 The 2018 cost allocation study indicates the revenue to cost ratios for the Street Lighting and  
 10 Unmetered Scattered Load rate classes are outside the OEB’s range. For 2018 and onward, it is  
 11 proposed the ratios for the Street Lighting and Unmetered Scattered Load rate classes be brought  
 12 within the OEB’s range. The Residential class will be adjusted upward to maintain revenue  
 13 neutrality.

**APPENDIX 1**

**Input Sheets I-6 & I-8**  
**Output Sheets O-1 & O-2 (first page only).**





# 2018 Cost Allocation Model

**EB-2017-0071**
**Sheet I6.2 Customer Data Worksheet -**

			1	2	3	7	8	9
	ID	Total	Residential	GS <50	GS>50-Regular	Street Light	Sentinel	Unmetered Scattered Load
<b>Billing Data</b>								
Bad Debt 3 Year Historical Average	<b>BDHA</b>	\$303,205	\$229,262	\$43,267	\$30,676	\$0	\$0	\$0
Late Payment 3 Year Historical Average	<b>LPHA</b>	\$257,333	\$189,877	\$36,868	\$30,588			
Number of Bills	<b>CNB</b>	1,475,760	357,468	41,316	4,236	48	12	276
Number of Devices	<b>CDEV</b>					9,314		
Number of Connections (Unmetered)	<b>CCON</b>	8,713				8,070	348	295
Total Number of Customers	<b>CCA</b>	33,613	29,789	3,443	353	4	1	23
Bulk Customer Base	<b>CCB</b>	-						
Primary Customer Base	<b>CCP</b>	33,878	29,789	3,443	353	269	1	23
Line Transformer Customer Base	<b>CCLT</b>	33,833	29,789	3,438	313	269	1	23
Secondary Customer Base	<b>CCS</b>	32,856	29,789	2,906	133	4	1	23
Weighted - Services	<b>CWCS</b>	32,257	29,789	1,976	56	404	17	15
Weighted Meter -Capital	<b>CWMC</b>	8,482,904	6,106,745	2,021,041	355,118	-	-	-
Weighted Meter Reading	<b>CWMR</b>	40,225	29,789	3,443	6,993	-	-	-
Weighted Bills	<b>CWNB</b>	420,701	357,468	45,861	17,113	37	9	213

**Bad Debt Data**

Historic Year:	2015	181,140	136,965	25,848	18,327			
Historic Year:	2016	378,475	286,175	54,008	38,291			
Bridge Year:	2017	350,000	264,645	49,944	35,411			
Three-year average		303,205	229,262	43,267	30,676	-	-	-

# 2018 Cost Allocation Model

EB-2017-0071

## Sheet 18 Demand Data Worksheet -

This is an input sheet for demand allocators.

CP TEST RESULTS	4 CP
NCP TEST RESULTS	4 NCP
<b>Co-incident Peak</b>	
1 CP	CP 1
4 CP	CP 4
12 CP	CP 12
<b>Non-co-incident Peak</b>	
1 NCP	NCP 1
4 NCP	NCP 4
12 NCP	NCP 12

Customer Classes	Total	1	2	3	7	8	9
		Residential	GS <50	GS>50-Regular	Street Light	Sentinel	Unmetered Scattered Load
		CP Sanity Check	Pass	Pass	Check 4CP	Check 4CP and 12CP	Check 4CP and 12CP
<b>CO-INCIDENT PEAK</b>							
<b>1 CP</b>							
Transformation CP	TCP1	130,045	71,461	20,180	38,271		133
Bulk Delivery CP	BCP1	130,045	71,461	20,180	38,271		133
Total Sytem CP	DCP1	130,045	71,461	20,180	38,271		133
<b>4 CP</b>							
Transformation CP	TCP4	497,642	267,266	67,776	160,347	1,577	131
Bulk Delivery CP	BCP4	497,642	267,266	67,776	160,347	1,577	131
Total Sytem CP	DCP4	497,642	267,266	67,776	160,347	1,577	131
<b>12 CP</b>							
Transformation CP	TCP12	1,228,789	610,928	175,873	437,014	3,087	278
Bulk Delivery CP	BCP12	1,228,789	610,928	175,873	437,014	3,087	278
Total Sytem CP	DCP12	1,228,789	610,928	175,873	437,014	3,087	278
<b>NON CO INCIDENT PEAK</b>							
<b>1 NCP</b>							
Classification NCP from							
Load Data Provider	DNCP1	140,280	74,085	22,170	43,132	653	98
Primary NCP	PNCP1	140,280	74,085	22,170	43,132	653	98
Line Transformer NCP	LTNCP1	135,921	74,085	22,126	38,819	653	98
Secondary NCP	SNCP1	108,576	74,085	18,933	14,665	653	98
<b>4 NCP</b>							
Classification NCP from							
Load Data Provider	DNCP4	536,073	280,089	83,525	169,029	2,525	357
Primary NCP	PNCP4	536,073	280,089	83,525	169,029	2,525	357
Line Transformer NCP	LTNCP4	519,003	280,089	83,357	152,126	2,525	357
Secondary NCP	SNCP4	412,319	280,089	71,330	57,470	2,525	357
<b>12 NCP</b>							
Classification NCP from							
Load Data Provider	DNCP12	1,337,868	643,526	215,097	469,459	7,357	820
Primary NCP	PNCP12	1,337,868	643,526	215,097	469,459	7,357	820
Line Transformer NCP	LTNCP12	1,290,492	643,526	214,667	422,514	7,357	820
Secondary NCP	SNCP12	996,621	643,526	183,693	159,816	7,357	820



# 2018 Cost Allocation Model

EB-2017-0071

## Sheet O1 Revenue to Cost Summary Worksheet -

**Instructions:**  
Please see the first tab in this workbook for detailed instructions

Class Revenue, Cost Analysis, and Return on Rate Base

Rate Base Assets	Total	1	2	3	7	8	9
		Residential	GS <50	GS>50-Regular	Street Light	Sentinel	Unmetered Scattered Load
Net Income	\$3,585,733	\$744,264	\$1,018,456	\$1,418,527	\$380,885	\$5,217	\$18,384
<b>RATIOS ANALYSIS</b>							
REVENUE TO EXPENSES STATUS QUO%	100.00%	89.76%	117.10%	112.52%	273.77%	95.16%	123.76%
EXISTING REVENUE MINUS ALLOCATED COSTS	(\$3,679,687)	(\$3,541,046)	(\$85,501)	(\$303,757)	\$257,884	(\$8,932)	\$1,665
Deficiency Input equals Output							
STATUS QUO REVENUE MINUS ALLOCATED COSTS	(\$0)	(\$1,453,368)	\$521,306	\$568,964	\$354,492	(\$2,248)	\$10,854
RETURN ON EQUITY COMPONENT OF RATE BASE	9.00%	3.09%	18.38%	14.51%	133.17%	6.62%	22.13%





# 2018 Cost Allocation Model

**EB-2017-0071**

**Sheet 02 Monthly Fixed Charge Min. & Max. Worksheet -**

Output sheet showing minimum and maximum level for Monthly Fixed Charge

**Summary**

Customer Unit Cost per month - Avoided Cost  
 Customer Unit Cost per month - Directly Related  
 Customer Unit Cost per month - Minimum System with PLCC Adjustment  
 Existing Approved Fixed Charge

	1	2	3	7	8	9
	Residential	GS <50	GS>50-Regular	Street Light	Sentinel	Unmetered Scattered Load
Customer Unit Cost per month - Avoided Cost	\$5.00	\$8.99	\$27.92	\$0.35	\$0.35	\$0.47
Customer Unit Cost per month - Directly Related	\$7.32	\$12.42	\$44.35	\$0.54	\$0.54	\$0.73
Customer Unit Cost per month - Minimum System with PLCC Adjustment	\$19.00	\$23.51	\$62.31	\$1.55	\$10.73	\$8.68
Existing Approved Fixed Charge	\$16.79	\$17.11	\$114.46	\$2.94	\$2.93	\$12.69