



Final Report

TRAVERSE CITY LIGHT & POWER

Electric Cost of Service Study and Financial Projection

April 2018

UFS
Utility Financial Solutions, LLC

**Specializing in Cost of Service,
Rate Design, and Financial Analysis**

Rate Design and Financial Analysis

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April 2018

Tim Arends
Executive Director
Traverse City Light & Power
1131 Hastings Street
Traverse City, MI 49686

Dear Mr. Arends;

We are pleased to present the Final Report for the electric cost of service study and financial projection for the Traverse City Light & Power (TCLP). This report was prepared to provide the TCLP with a comprehensive examination of its existing rate structure by an outside party.

The specific purposes of this rate study are:

- Determine electric utility's revenue requirements for fiscal year FY 2018 - 2019
- Identify cross-subsidies that may exist between rate classes
- Recommend rate adjustments needed to meet targeted revenue requirements
- Identify the appropriate monthly customer charge for each customer class

This report includes results of the electric cost of service study and financial projection and recommendations on future rate designs.

This report is intended for information and use by the utility and management for the purposes stated above and is not intended to be used by anyone except the specified parties.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Beauchamp", is written over a horizontal line.

Utility Financial Solutions, LLC
Mark Beauchamp
CPA, MBA, CMA
185 Sun Meadow Ct
Holland, MI 49424

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1. Introduction

This report was prepared to provide the Traverse City Light & Power (TCLP) with an electric cost of service study and financial projection and a comprehensive examination of its existing rate structure by an outside party. The specific purposes of the study are identified below:

- 1) **Determine electric utility's revenue requirements for fiscal year FY 2018 - 2019.** TCLP's revenue requirements were projected for the period from FY 2018 - 2019 through FY 2022 - 2023 and included adjustments for the following:
 - a. Projected power costs
 - b. Projected changes in staffing levels
 - c. Capital improvement plan projected over next five years
- 2) **Identify cross-subsidies that may exist between rate classes.** Cross-subsidies exist when certain customer classes subsidize the electric costs of other customers. The rate study identifies if cross-subsidies exist and practical ways to reduce the subsidies. The cost of service study was completed using FY 2018 - 2019 projected revenues and expenses. The financial projections are for the period from FY 2018 - 2019 through FY 2022 - 2023.
- 3) **Recommend rate adjustments needed to meet targeted revenue requirements.** The primary purpose of this study is to identify appropriate revenue requirements and the rate adjustments needed to meet targeted revenue requirements. The report includes a long-term rate track for TCLP to help ensure the financial stability of the utility in future years.
- 4) **Unbundled electric rates.** The cost of providing electricity to customers consists of several components, including power generation, distribution, customer services, transmission, and transfers to the general fund. Electric unbundling identifies the cost of each component to assist the utility in preparing for electric restructuring and understanding its cost structure.
- 5) **Identify the appropriate monthly customer charge for each customer class.** The monthly customer charge consists of fixed costs to service customers that do not vary based on the amount of electricity used.

2. Cost of Service Summary

Utility Rate Process

TCLP retained Utility Financial Solutions to review utility rates and cost of service and make recommendations on the appropriate course of action. This report includes results of the electric cost of service and unbundling study and recommendations on future rate designs.

Utility Revenue Requirements

To determine revenue requirements, the revenues and expenses for Fiscal Years 2016 and 2017, 2018/2019 budget were analyzed, with adjustments made to reflect projected operating characteristics. ***The projected financial statements are for cost of service purposes only.***

Table 1 is the projected financial statement for the Electric Department from FY 2018 - 2019 through FY 2022 - 2023. The FY 2018 - 2019 rate of return calculation established an operating income target of \$2.9M (See Table 4).

Adjusted operating income for FY 2018 - 2019 is projected at \$1.02M and decreases to \$97K in FY 2022 - 2023. Operating income is one target that helps to determine if rate adjustments are needed. The following pages review cash flow and debt coverage ratio which are also important indicators.

Table 1 – Financial Statements (without rate adjustments)

Description	Projected FY 18 - 19	Projected FY 19 - 20	Projected FY 20 - 21	Projected FY 21 - 22	Projected FY 22 - 23
Operating Revenues:					
Residential	\$ 4,893,847	\$ 4,942,785	\$ 4,992,213	\$ 5,042,135	\$ 5,092,557
Residential Water Heater	273,591	276,327	279,091	281,881	284,700
Residential Space Heat	105,357	106,411	107,475	108,550	109,635
Senior Water Heater	49,385	49,878	50,377	50,881	51,390
Senior Citizen	625,173	631,425	637,739	644,116	650,558
Senior Space Heat	16,918	17,087	17,258	17,431	17,605
Residential Life Support	17,831	18,009	18,189	18,371	18,555
Residential Senior Life Support	7,980	8,060	8,141	8,222	8,304
Commercial/General	4,094,095	4,135,036	4,176,387	4,218,150	4,260,332
Commercial Electric Heat and Air Conditioning	162,049	163,670	165,306	166,959	168,629
Commercial and Industrial Water Heating Service	1,602	1,618	1,634	1,650	1,667
Municipal Pumping Service (MP-1)	59,148	59,739	60,337	60,940	61,550
Municipal Pumping Service (MP-2)	174,293	176,036	177,797	179,575	181,370
Municipal Pumping Service at 103%	55,707	56,265	56,827	57,395	57,969
Private Area Lighting	122,345	123,568	124,804	126,052	127,312
Street Lighting	7,472	7,547	7,622	7,698	7,775
Commercial Demand/General Secondary	10,197,762	10,299,739	10,402,737	10,506,764	10,611,832
Commercial Demand Primary Metered	178,810	180,598	182,404	184,228	186,070
Primary Service High Load Factor	7,439,778	7,514,175	7,589,317	7,665,210	7,741,862
Primary Interruptible	456,742	461,310	465,923	470,582	475,288
Metal Melting	1,762,762	1,780,389	1,798,193	1,816,175	1,834,337
Forfeited Discounts	51,000	52,020	53,060	54,122	55,204
Merchandise and Jobbing	73,500	74,235	74,977	75,727	76,484
Sale of Scrap	50,000	50,500	51,005	51,515	52,030
Recovery of Bad Debts	200	202	204	206	208
MISO Income	2,800,000	2,828,000	2,856,280	2,884,843	2,913,691
Miscellaneous	37,000	37,370	37,744	38,121	38,502
Additional PCA Revenues	-	211,303	428,966	653,139	883,973
Total Operating Revenues	\$ 33,714,347	\$ 34,263,303	\$ 34,822,007	\$ 35,390,640	\$ 35,969,390
Operating Expenses:					
Purchased Power (Cost of Sales and Service)	\$ 20,921,092	\$ 21,341,606	\$ 21,770,572	\$ 22,208,160	\$ 22,654,544
Production Expense	361,355	368,582	375,954	383,473	391,142
Total Transmission O&M	467,005	476,345	485,872	495,589	505,501
Total Distribution O&M	4,169,815	4,253,211	4,338,275	4,425,041	4,513,542
Customer/Sales Expense	526,584	537,115	547,858	558,815	569,991
Administrative and General Expense	1,322,386	1,348,834	1,375,810	1,403,327	1,431,393
Public Service Expense	490,123	499,925	509,924	520,122	530,525
Insurance	77,252	78,798	80,373	81,981	83,621
Depreciation Expense	2,675,985	2,785,805	2,990,725	3,199,345	3,391,565
Total Operating Expenses	\$ 31,011,596	\$ 31,690,221	\$ 32,475,363	\$ 33,275,853	\$ 34,071,824
Operating Income	\$ 2,702,751	\$ 2,573,083	\$ 2,346,644	\$ 2,114,787	\$ 1,897,566
Other Income & Expense					
Interest and Other Income	94,166	69,545	61,100	56,056	46,134
Other	619,340	631,727	644,361	657,249	570,394
Payment In Lieu of Taxes	(1,690,426)	(1,716,642)	(1,744,155)	(1,772,335)	(1,800,776)
Non Operating Income/Expense	\$ (976,920)	\$ (1,015,371)	\$ (1,038,694)	\$ (1,059,031)	\$ (1,184,249)
Net Income	\$ 1,725,831	\$ 1,557,712	\$ 1,307,949	\$ 1,055,757	\$ 713,317
Adjusted Operating Income	\$ 1,012,325	\$ 856,440	\$ 602,488	\$ 342,453	\$ 96,790

Projected Cash Flow

Table 2 is the projected cash flow for FY 2018 - 2019 through FY 2022 - 2023, including projections of capital improvements as provided by the TCLP. Changes in the capital improvement plan can greatly affect the cash balance and recommended minimum cash reserve target. The cash balance for FY 2018 - 2019 is projected at \$13.8M and \$8.8M in FY 2022 - 2023. The recommended minimum cash reserve level for FY 2018 - 2019 is \$10.9M and \$9.6M for FY 2022 - 2023.

Table 2 – Projected Cash Flows (without rate adjustments)

Description	Projected FY 18 - 19	Projected FY 19 - 20	Projected FY 20 - 21	Projected FY 21 - 22	Projected FY 22 - 23
Projected Cash Flows					
Net Income	\$ 1,725,831	\$ 1,557,712	\$ 1,307,949	\$ 1,055,757	\$ 713,317
Depreciation Expense/Amortization	2,675,985	2,785,805	2,990,725	3,199,345	3,391,565
Cash Available from Operations	\$ 4,401,816	\$ 4,343,517	\$ 4,298,674	\$ 4,255,101	\$ 4,104,882
Pension Accelerated Funding	\$ 531,000	\$ 541,620	\$ 552,452	\$ 563,501	574,771
Estimated Annual Capital Additions	8,795,000	5,491,000	4,755,000	5,676,000	3,935,000
Net Cash From Operations	\$ (4,924,184)	\$ (1,689,103)	\$ (1,008,778)	\$ (1,984,400)	\$ (404,889)
Beginning Cash Balance	\$ 18,833,194	\$ 13,909,010	\$ 12,219,906	\$ 11,211,128	\$ 9,226,729
Ending Cash Balance	\$ 13,909,010	\$ 12,219,906	\$ 11,211,128	\$ 9,226,729	\$ 8,821,840
Total Cash Available	\$ 13,909,010	\$ 12,219,906	\$ 11,211,128	\$ 9,226,729	\$ 8,821,840
Recommended Minimum	\$ 10,946,963	\$ 10,200,856	\$ 10,315,273	\$ 10,585,564	\$ 9,552,320

Minimum Cash Reserve

Table 3 details the minimum level of cash reserves required to help ensure timely replacement of assets and to provide financial stability of the utility. The methodology used to establish this target is based on certain assumptions related to a percentage of operating expense, historical investment, capital improvements, and debt service to be kept in cash reserves. Based on these assumptions, TCLP should maintain a minimum of \$10.9M in cash reserves for FY 2018 - 2019 and \$9.6M in FY 2022 - 2023.

Table 3 – Minimum Cash Reserves (without rate adjustments)

Description	Projected FY 18 - 19	Projected FY 19 - 20	Projected FY 20 - 21	Projected FY 21 - 22	Projected FY 22 - 23
Minimum Cash Reserve Allocation					
Operation & Maintenance Less Depreciation Expense	12.3%	12.3%	12.3%	12.3%	12.3%
Purchase Power Expense	9.7%	9.7%	9.7%	9.7%	9.7%
Historical Rate Base	1%	1%	1%	1%	1%
Market Risk	50%	50%	50%	50%	50%
Five Year Capital Improvements - Net of bond proceeds	20%	20%	20%	20%	20%
% Plant Depreciated	35%	36%	37%	38%	40%
Calculated Minimum Cash Level					
Operation & Maintenance Less Depreciation Expense	\$ 914,119	\$ 932,401	\$ 951,049	\$ 970,070	\$ 989,472
Purchase Power Expense	2,024,915	2,065,616	2,107,134	2,149,488	2,192,693
Historical Rate Base	943,336	998,246	1,045,796	1,102,556	1,141,906
Market Risk	1,334,193	1,334,193	1,334,193	1,334,193	1,334,193
Five Year Capital Improvements - Net of bond proceeds	5,730,400	4,870,400	4,877,100	5,029,256	3,894,056
Minimum Cash Reserve Levels	\$ 10,946,963	\$ 10,200,856	\$ 10,315,273	\$ 10,585,564	\$ 9,552,320
Projected Cash Reserves	\$ 13,909,010	\$ 12,219,906	\$ 11,211,128	\$ 9,226,729	\$ 8,821,840

Projected cash balances fall below the recommended minimums during the projection period.

Rate of Return

The optimal target for setting rates is the establishment of a target operating income to help ensure the following:

- A. Funding of interest expense on the outstanding principal on debt. Interest expense is below the operating income line and needs to be recouped through the operating income balance.
- B. Funding of the inflationary increase on the assets invested in the system. The inflation on the replacement of assets invested in the utility should be recouped through the Operating Income.
- C. Funding of depreciation expense.
- D. Adequate rate of return on investment to help ensure current customers are paying their fair share of the use of the infrastructure and not deferring the charge to future generations.

As improvements are made to the system, the optimal operating income target will increase unless annual depreciation expense is greater than yearly capital improvements. The revenue requirements for the study are set on the utility basis. Table 4 identifies the utility basis target established for FY 2018 - 2019 is \$2.9M and increases to \$3.5M in FY 2022 - 2023.

Table 4 – Rate of Return Calculation

Description	Projected FY 18 - 19	Projected FY 19 - 20	Projected FY 20 - 21	Projected FY 21 - 22	Projected FY 22 - 23
Target Operating Income Determinants					
Net Book Value/Working Capital	\$ 61,108,391	\$ 63,813,587	\$ 65,577,862	\$ 68,054,517	\$ 68,597,953
System Equity	\$ 61,108,391	\$ 63,813,587	\$ 65,577,862	\$ 68,054,517	\$ 68,597,953
Target Operating Income Allocation					
System Equity	4.79%	4.85%	4.94%	5.02%	5.16%
Target Operating Income					
System Equity	\$ 2,924,342	\$ 3,094,563	\$ 3,241,968	\$ 3,417,924	\$ 3,539,909
Target Operating Income	\$ 2,924,342	\$ 3,094,563	\$ 3,241,968	\$ 3,417,924	\$ 3,539,909
Projected Operating Income	\$ 1,012,325	\$ 856,440	\$ 602,488	\$ 342,453	\$ 96,790
Rate of Return in %	4.8%	4.8%	4.9%	5.0%	5.2%

Recommended Rate Track

The study identifies maintaining current revenues in FY 2018 - 2019, and increase annually thereafter in 2021 and 2023 to maintain minimum cash targets. Table 5 is a summary of the financial results detailing the recommended revenue adjustments required to meet target operating income.

Table 5 – Recommended Revenue Adjustments

Fiscal Year	Projected Rate Adjustments	Projected Expenses	Projected Revenues	Adjusted Operating Income	Target Operating Income	Projected Cash Balances	Recommended Minimum Cash
FY 18 - 19	0.0%	\$ 31,011,596	\$ 33,714,347	\$ 1,012,325	\$ 2,924,342	\$ 13,909,010	\$ 10,946,963
FY 19 - 20	0.0%	31,690,221	34,263,303	856,440	3,094,563	12,219,906	10,200,856
FY 20 - 21	2.0%	32,475,363	35,508,806	1,254,948	3,241,968	11,863,588	10,315,273
FY 21 - 22	0.0%	33,275,853	36,084,308	1,001,274	3,417,924	10,541,272	10,558,658
FY 22 - 23	2.0%	34,071,824	37,384,611	1,440,921	3,539,909	11,487,086	10,628,570

Cost of Service Summary Results

A cost of service study was completed to determine the cost of providing service to each class of customers and to assist in design of electric rates for customers. A cost of service study consists of the following general steps:

- 1) Determine utility revenue requirement for test year FY 2018 - 2019
- 2) Classify utility expenses into common cost pools
- 3) Allocate costs to customer classes based on the classes' contribution to utility expenses
- 4) Compare revenues received from each class to the cost of service

The cost of service summary is included as Table 6 which compares the projected cost to serve each class with the revenue received from each class. The “% change” column is the revenue adjustment necessary to meet projected cost of service requirements. The cost of service summary uses the current rates including any adjustment factors.

Table 6 – Cost of Service Summary

Customer Class	Cost of Service	Projected Revenues	% Change
Residential	5,401,462	4,893,847	10.4%
Residential Water Heater	297,836	273,591	8.9%
Residential Space Heat	113,806	105,357	8.0%
Senior Water Heater	65,656	49,385	32.9%
Senior Citizen	814,125	625,173	30.2%
Senior Space Heat	19,007	16,918	12.3%
Residential Life Support	22,573	17,831	26.6%
Residential Senior Life Support	12,817	7,980	60.6%
Commercial/General	3,605,601	4,094,095	-11.9%
Commercial Electric Heat and Air Conditioning	164,347	162,049	1.4%
Commercial and Industrial Water Heating Service	1,896	1,602	18.4%
Municipal Pumping Service (MP-1)	60,613	59,148	2.5%
Municipal Pumping Service (MP-2)	243,611	174,293	39.8%
Municipal Pumping Service at 103%	65,193	55,707	17.0%
Commercial Demand/General Secondary	10,857,881	10,197,762	6.5%
Commercial Demand Primary Metered	176,298	178,810	-1.4%
Primary Service High Load Factor	7,721,241	7,439,778	3.8%
Primary Interruptible	489,623	456,742	7.2%
Metal Melting	1,899,299	1,762,762	7.7%
Total	32,032,888	30,572,830	4.8%

Cost of Service Results

Table 7 shows the average cost of service per kWh and compares the cost to the average revenue per kWh for each customer class.

Table 7 – Average Cost per kWh vs. Average Revenue per kWh

Customer Class	Cost of Service \$/kWh	Projected Revenues \$/kWh
Residential	\$ 0.1182	\$ 0.1071
Residential Water Heater	0.1123	0.1031
Residential Space Heat	0.1078	0.0998
Senior Water Heater	0.1196	0.0900
Senior Citizen	0.1247	0.0957
Senior Space Heat	0.1060	0.0944
Residential Life Support	0.1060	0.0837
Residential Senior Life Support	0.1224	0.0762
Commercial/General	0.1162	0.1319
Commercial Electric Heat and Air Conditioning	0.1090	0.1075
Commercial and Industrial Water Heating Service	0.1366	0.1154
Municipal Pumping Service (MP-1)	0.1039	0.1014
Municipal Pumping Service (MP-2)	0.1263	0.0903
Municipal Pumping Service at 103%	0.1176	0.1005
Commercial Demand/General Secondary	0.1023	0.0961
Commercial Demand Primary Metered	0.0886	0.0899
Primary Service High Load Factor	0.0824	0.0794
Primary Interruptible	0.0785	0.0732
Metal Melting	0.0716	0.0664

Cost differences result from usage patterns of customers and how efficiently each class of customer use facilities based on load data provided by TCLP.

Distribution Costs

Separation of distribution cost helps identify distribution charges for each customer class and the fixed monthly customer charge. Distribution rates include separation of the following costs:

- Operation and maintenance of distribution & transmission system
- Contributions to general fund
- Customer service
- Customer accounting
- Meter reading
- Billing
- Meter operation & maintenance
- Administrative expenses

The distribution rates consist of two components:

- Monthly customer charge to recover the costs of meter reading, billing, customer service, and a portion of maintenance and operations of the distribution system.
- Distribution rate based on billing parameter, (kW or kWh) to recover the cost to operate and maintain the distribution system. Table 8 identifies the cost-based distribution rates for customer classes.

Table 8 – Distribution Costs by Customer Class (COS)

Customer Class	Monthly Customer Charge	Distribution Rate	Billing Basis
Residential	\$ 15.11	\$ 0.0268	kWh
Residential Water Heater	15.13	0.0257	kWh
Residential Space Heat	15.14	0.0256	kWh
Senior Water Heater	15.10	0.0263	kWh
Senior Citizen	15.09	0.0264	kWh
Senior Space Heat	15.23	0.0304	kWh
Residential Life Support	15.15	0.0238	kWh
Residential Senior Life Support	15.11	0.0284	kWh
Commercial/General	24.10	0.0254	kWh
Commercial Electric Heat and Air Conditioning	24.87	0.0338	kWh
Commercial and Industrial Water Heating Service	23.96	0.0254	kWh
Municipal Pumping Service (MP-1)	31.62	0.0266	kWh
Municipal Pumping Service (MP-2)	129.44	0.0511	kWh
Municipal Pumping Service at 103%	140.56	0.0417	kWh
Commercial Demand/General Secondary	127.46	7.78	kW
Commercial Demand Primary Metered	356.81	7.64	kW
Primary Service High Load Factor	376.50	8.45	kW
Primary Interruptible	424.72	9.44	kW
Metal Melting	621.62	7.34	kW

Power Supply Costs

Table 9 identifies the average cost of providing power supply to customers of TCLP.

Table 9 – Power Supply Costs by Customer Class

Customer Class	Demand	Billing Basis	Energy	Billing Basis
Residential	\$ 0.0186	kWh	\$ 0.0442	kWh
Residential Water Heater	0.0184	kWh	0.0442	kWh
Residential Space Heat	0.0168	kWh	0.0442	kWh
Senior Water Heater	0.0184	kWh	0.0442	kWh
Senior Citizen	0.0185	kWh	0.0442	kWh
Senior Space Heat	0.0162	kWh	0.0441	kWh
Residential Life Support	0.0184	kWh	0.0442	kWh
Residential Senior Life Support	0.0185	kWh	0.0443	kWh
Commercial/General	0.0263	kWh	0.0442	kWh
Commercial Electric Heat and Air Conditioning	0.0246	kWh	0.0441	kWh
Commercial and Industrial Water Heating Service	0.0256	kWh	0.0442	kWh
Municipal Pumping Service (MP-1)	0.0260	kWh	0.0442	kWh
Municipal Pumping Service (MP-2)	0.0290	kWh	0.0445	kWh
Municipal Pumping Service at 103%	0.0285	kWh	0.0443	kWh
Commercial Demand/General Secondary	8.20	KW	0.0442	kWh
Commercial Demand Primary Metered	7.93	KW	0.0428	kWh
Primary Service High Load Factor	8.92	KW	0.0428	kWh
Primary Interruptible	9.37	KW	0.0428	kWh
Metal Melting	9.19	KW	0.0428	kWh

Combined Cost Summary

Table 10 identifies the cost of service rates for each customer class. Charging these rates would directly match the cost of providing service to customers identified in this study.

Table 10 – Total Costs by Customer Class

Customer Class	Current Average	COS Customer		
	Customer Charge	Charge	Demand	Energy
Residential	\$ 6.00	\$ 15.11	\$ -	\$ 0.0897
Residential Water Heater	6.00	15.13	-	0.0883
Residential Space Heat	6.00	15.14	-	0.0866
Senior Water Heater	5.00	15.10	-	0.0889
Senior Citizen	5.00	15.09	-	0.0891
Senior Space Heat	5.00	15.23	-	0.0907
Residential Life Support	4.80	15.15	-	0.0864
Residential Senior Life Support	4.00	15.11	-	0.0912
Commercial/General	13.00	24.10	-	0.0959
Commercial Electric Heat and Air Conditioning	13.00	24.87	-	0.1025
Commercial and Industrial Water Heating Service	11.75	23.96	-	0.0952
Municipal Pumping Service (MP-1)	19.00	31.62	-	0.0967
Municipal Pumping Service (MP-2)	22.00	129.44	-	0.1247
Municipal Pumping Service at 103%	19.00	140.56	-	0.1145
Commercial Demand/General Secondary	15.00	127.46	15.97	0.0442
Commercial Demand Primary Metered	16.00	356.81	15.56	0.0428
Primary Service High Load Factor	50.00	376.50	17.37	0.0428
Primary Interruptible	50.00	424.72	18.81	0.0428
Metal Melting	40.00	621.62	16.53	0.0428

3. Functionalization of Costs

Delivery of electricity consists of many components that bring electricity from the power supply facilities to the communities and eventually into customer facilities. The facilities consist of four major components: transmission, distribution, customer-related services, and administration. Following are general descriptions of each of these facilities and the sub-breakdowns within each category.

Transmission

The transmission system is comprised of four types of subsystems that operate together:

- 1) Backbone and inter-tie transmission facilities are the network of high voltage facilities through which a utility's major production sources are integrated.
- 2) Generation set-up facilities are the substations through which power is transformed from a utility's generation voltages to its various transmission voltages.
- 3) Sub-transmission plant consists of lower voltage facilities to transfer electric energy from convenient points on a utility's backbone system to its distribution system.
- 4) Radial transmission facilities are those that are not networked with other transmission lines but are used to serve specific loads directly.

Operation of the transmission system also consists of providing certain services that ensure a stable supply of power. These services are typically referred to as ancillary services. The Federal Energy Regulatory Commission (FERC) has defined six ancillary service charges for the use of transmission facilities. For TCLP, these charges will be passed-through charges by the control area operator. Ancillary services consist of the following:

- **Mandatory Ancillary Service Charges:**
 - Reactive Supply and Voltage Control
 - Regulation and Frequency Response Service
 - Energy Imbalance Charges
 - Operating Reserves Spinning
 - Operating Reserves Supplemental
 - Reactive Power Supply
 - Power losses from use of transmission system

Terminology of Cost of Service

FUNCTIONALIZATION – Cost data arranged by functional category (e.g. power supply, transmission, distribution)

CLASSIFICATION – Assignment of functionalized costs to cost components (e.g. demand, energy and customer related).

ALLOCATION – Allocating classified costs to each class of service based on each class's contribution to that specific cost component.

DEMAND COSTS – Costs that vary with the maximum or peak usage. Measured in kilowatts (kW)

ENERGY COSTS – Costs that vary over an extended period of time. Measured in kilowatt-hours (kWh)

CUSTOMER COSTS – Costs that vary with the number of customers on the system, e.g. metering costs.

DIRECT ASSIGNMENT – Costs identified as belonging to a specific customer or group of customers.

Distribution

The distribution facilities connect the customer with the transmission grid to provide the customer with access to the electrical power that has been generated and transmitted. The distribution plant includes substations, primary and secondary conductors, poles, and line transformers that are jointly used and in the public right-of-way.

Substations typically separate the distribution plant from the transmission system. The substation power transformer “steps down” the voltage to a level that is more practical to install on and under city streets.

Distribution circuits are divided into primary and secondary voltages with the primary voltages usually ranging between 35 kV and 4 kV and the secondary below 4 kV.

Distribution Customer Types

Sub-transmission customers are served directly from the substation feeder and bypass both the secondary and primary distribution lines. The charges for this type of customer should reflect the cost of the substation and not include the cost of primary or secondary line charges.

Primary customers are typically referred to as customers who have purchased, owned, and maintained their own transformers that convert the voltage to the secondary voltage level. The rates for these customers should reflect the cost of substations and the cost of primary distribution lines and not include the cost of secondary line extensions.

Secondary customers have the services provided by the utilities directly into their facilities. The utility provides the customer with the transformer and the connection on the customers’ facilities.

Customer-Related Services

Certain administrative-type services are necessary to ensure customers are provided service connections and disconnections in a timely manner and the facilities are in place to read meters and bill for customer usages. These services typically consist of the following components:

- Customer Services – The cost of providing personnel to assist customers with questions and dispatch personnel to connect and disconnect meters.
- Billing and Collections – The cost of billing and collections personnel, postage, and supplies.
- Meter Reading – The cost of reading customers’ meters.
- Meter Operation and Maintenance – The cost of installing and maintaining customer meters.

Administrative Services

These costs are sometimes referred to as overhead costs and relate to functions that cannot be directly-attributed to any service. These costs are spread to the other services through an allocator such as labor, expenses, or total rate base. These costs may consist of Board expenses, property insurance, and wages for higher level management of the utility.

System Losses

As energy moves through each component of the transmission and distribution system, some of the power is lost and cannot be sold to customers. Losses vary based on time of day and season. Typically, as system usage increases or ambient temperature increases, the percentages of losses that occur also increase. These losses are recovered from distribution customers through an analysis of the peak losses that occur in the system. The average system losses and unaccounted for energy for TCLP are approximately 2.8%. (Typical municipal system losses are approximately 5.4%)

4. Unbundling Process

The cost of power supply, distribution, and customer services are identified as part of the unbundling process and are the first step in determining unbundled charges to customers. The total revenue requirements of \$32.6M are separated into four categories identified in Table 11.

Table 11 – Breakdown of TCLP Cost Structure

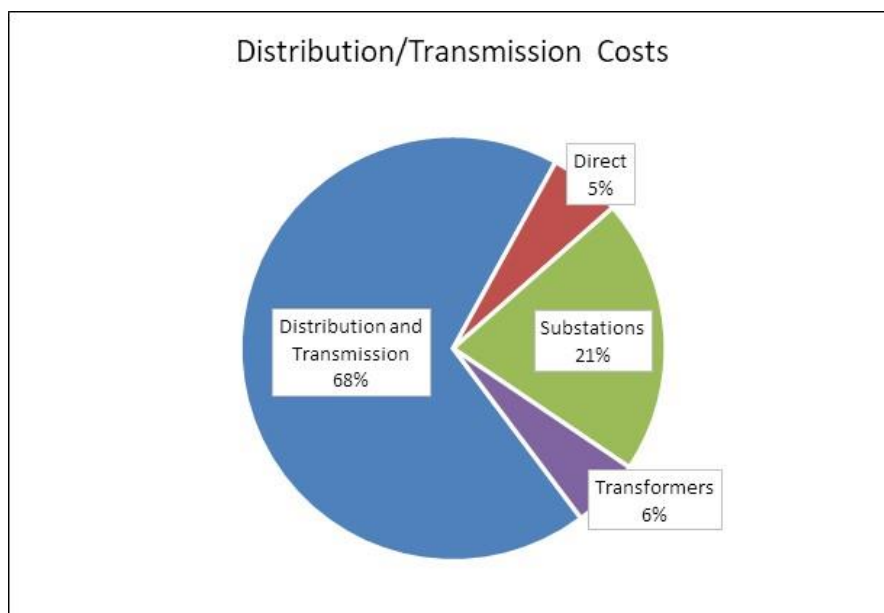
Expense Type	Amount	Percentage
Power Supply	\$ 21,426,757	66.7%
Distribution/Transmission	\$ 7,273,386	22.6%
Transfer to City	\$ 1,816,677	5.7%
Customer	\$ 1,627,477	5.1%
	\$ 32,144,298	100%

TCLP is projected to expend 66.7% of its total costs toward power supply. Distribution/transmission-related costs are 22.6%; transfers to the city represent 5.7% and customer service 5.1%. These components are broken down into each of the subcomponents and are identified in the following sections.

Distribution Breakdown

Distribution rates consist of a number of different components. Total distribution-related costs of \$7.27M for FY 2018 - 2019 are broken down into the main components including substations, transformers, transmission, and distribution lines. Figure 1 shows the breakdown of distribution components identified in the study.

Figure 1 – Breakdown of Distribution Costs

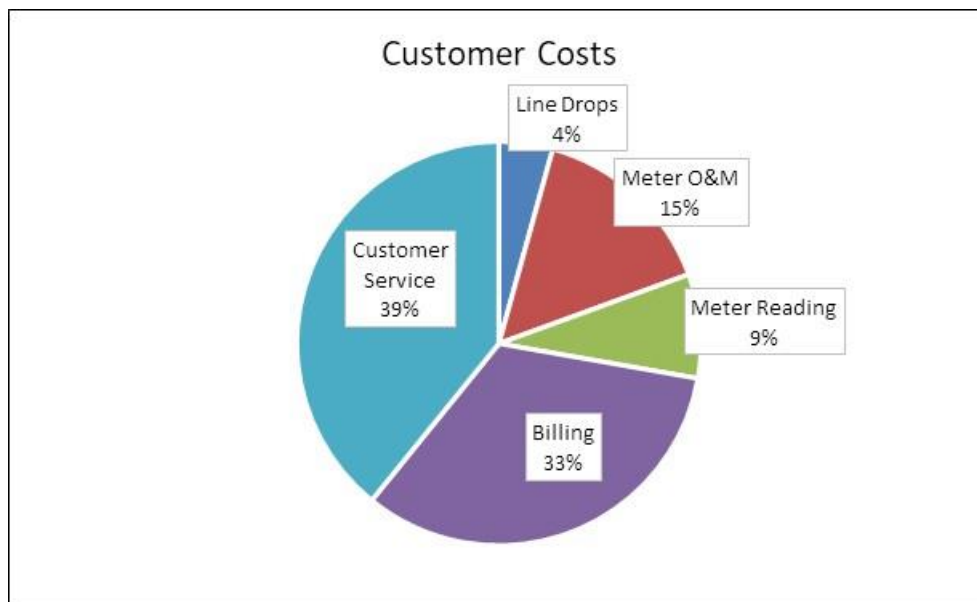


Each of these components is allocated to customer groups based on certain factors established in the study. These factors are based on the efficiency of each customer class and the time of day or the season the electricity is used. Other factors are also considered, such as the length of line extensions to reach certain customer classes.

Customer-Related Cost Breakdown

TCLP total expenses for customer-related costs are \$1.6M for FY 2018 - 2019. The cost is broken down into the components identified in Figure 2.

Figure 2 – Breakdown of Customer Costs



Power Supply Cost Breakdown

Power supply costs for FY 2018 - 2019 were made up of purchased power.

5. Significant Assumptions

This section outlines the procedures used to develop the cost of service and unbundling study for TCLP and the related significant assumptions.

Forecasted Operating Expenses

Forecasted expenses were based on 2016 and 2017, 2018/2019 budget adjusted for power supply costs and inflation. The table below is a summary of the expenses used in the analysis; the projected operating expenses include an adjustment for any city contributions.

Table 12 – Projected Operating Expenses for FY 2018 - 2019 through FY 2022 - 20233

Description	Projected FY 18 - 19	Projected FY 19 - 20	Projected FY 20 - 21	Projected FY 21 - 22	Projected FY 22 - 23
Operating Expenses:					
Purchased Power (Cost of Sales and Service)	\$ 20,921,092	\$ 21,341,606	\$ 21,770,572	\$ 22,208,160	\$ 22,654,544
Production Expense	361,355	368,582	375,954	383,473	391,142
Total Transmission O&M	467,005	476,345	485,872	495,589	505,501
Total Distribution O&M	4,169,815	4,253,211	4,338,275	4,425,041	4,513,542
Customer/Sales Expense	526,584	537,115	547,858	558,815	569,991
Administrative and General Expense	1,322,386	1,348,834	1,375,810	1,403,327	1,431,393
Public Service Expense	490,123	499,925	509,924	520,122	530,525
Insurance	77,252	78,798	80,373	81,981	83,621
Depreciation Expense	2,675,985	2,785,805	2,990,725	3,199,345	3,391,565
Total Operating Expenses	\$ 31,011,596	\$ 31,690,221	\$ 32,475,363	\$ 33,275,853	\$ 34,071,824

Power supply costs from FY 2018 - 2019 through FY 2022 - 2023 are based on TCLP's current charges adjusted for system growth factors and inflation.

Load Data

Load data is one of the most critical components of a cost of service study. Information from the billing statistics were used to determine the usage patterns of each customer class after reconciling revenues with financial statements to ensure a good basis for development of the study.

Annual Projection Assumptions

The kWh sales forecast is based on FY2017 actual adjusted for growth. Table 13 details growth, inflation of expenses, changes in purchase power costs and interest earned on investments.

Table 13 – Projection Annual Escalation Factors FY 2018 - 2019 through FY 2022 - 2023

Fiscal Year	Inflation	Growth	Purchase Power Change	Investment Income
FY 18 - 19	2.0%	1.0%		0.5%
FY 19 - 20	2.0%	1.0%	1.0%	0.5%
FY 20 - 21	2.0%	1.0%	1.0%	0.5%
FY 21 - 22	2.0%	1.0%	1.0%	0.5%
FY 22 - 23	2.0%	1.0%	1.0%	0.5%

System Loss Factors

Losses occurring from the transmission and distribution of electricity can vary from year to year depending upon weather and system loading.

Revenue Forecast

The revenue forecast was based on FY2017 usages adjusted for growth rate assumptions.

6. Recommendations and Additional Information

We recommend that the utility move toward cost of service for each customer class.

The study indicates rate adjustments are needed to meet minimum cash and operating income targets. To ensure the utility meets financial targets and remains financially stable, the rate track identified in may be considered:

Table 14 – Recommended Rate Adjustments FY 2018 - 2019 through FY 2022 - 2023

Fiscal Year	Projected Rate Adjustments	Projected Expenses	Projected Revenues	Adjusted Operating Income	Target Operating Income	Projected Cash Balances	Recommended Minimum Cash
FY 18 - 19	0.0%	\$ 31,011,596	\$ 33,714,347	\$ 1,012,325	\$ 2,924,342	\$ 13,909,010	\$ 10,946,963
FY 19 - 20	0.0%	31,690,221	34,263,303	856,440	3,094,563	12,219,906	10,200,856
FY 20 - 21	2.0%	32,475,363	35,508,806	1,254,948	3,241,968	11,863,588	10,315,273
FY 21 - 22	0.0%	33,275,853	36,084,308	1,001,274	3,417,924	10,541,272	10,558,658
FY 22 - 23	2.0%	34,071,824	37,384,611	1,440,921	3,539,909	11,487,086	10,628,570

The cost of service study identified some customer classes are subsidizing other customer classes. TCLP should consider movements toward cost of service using a bandwidth of plus or minus 2%. Using the 0% rate adjustment, this would result in no customer class given a rate increase greater than 2% or less than 0%. Table 15 identifies the cost of service charges compared with the projected current revenues for each class. Classes that indicate a lower % change than the total percentage change are providing subsidy to other customer classes, conversely customer classes with a higher % change than the total percentage are receiving subsidy.

Table 15 – Cost of Service Summary Results

Customer Class	Cost of Service	Projected Revenues	% Change
Residential	5,401,462	4,893,847	10.4%
Residential Water Heater	297,836	273,591	8.9%
Residential Space Heat	113,806	105,357	8.0%
Senior Water Heater	65,656	49,385	32.9%
Senior Citizen	814,125	625,173	30.2%
Senior Space Heat	19,007	16,918	12.3%
Residential Life Support	22,573	17,831	26.6%
Residential Senior Life Support	12,817	7,980	60.6%
Commercial/General	3,605,601	4,094,095	-11.9%
Commercial Electric Heat and Air Conditioning	164,347	162,049	1.4%
Commercial and Industrial Water Heating Service	1,896	1,602	18.4%
Municipal Pumping Service (MP-1)	60,613	59,148	2.5%
Municipal Pumping Service (MP-2)	243,611	174,293	39.8%
Municipal Pumping Service at 103%	65,193	55,707	17.0%
Commercial Demand/General Secondary	10,857,881	10,197,762	6.5%
Commercial Demand Primary Metered	176,298	178,810	-1.4%
Primary Service High Load Factor	7,721,241	7,439,778	3.8%
Primary Interruptible	489,623	456,742	7.2%
Metal Melting	1,899,299	1,762,762	7.7%
Total	32,032,888	30,572,830	4.8%

TCLP may consider movements in the customer charges to move toward cost of service based customer charges to help ensure fixed distribution charges are collected in the customer charge. Table 16 compares the total cost of service monthly customer charges with the current charges. By charging cost of service rates for the monthly charge TCLP reduces it risk associated with power usage fluctuations due to weather etc.

Table 16 – Customer Charge Comparison

Customer Class	COS Customer Charge	Current Average Customer Charge
Residential	\$ 15.11	\$ 6.00
Residential Water Heater	15.13	6.00
Residential Space Heat	15.14	6.00
Senior Water Heater	15.10	5.00
Senior Citizen	15.09	5.00
Senior Space Heat	15.23	5.00
Residential Life Support	15.15	4.80
Residential Senior Life Support	15.11	4.00
Commercial/General	24.10	13.00
Commercial Electric Heat and Air Conditioning	24.87	13.00
Commercial and Industrial Water Heating Service	23.96	11.75
Municipal Pumping Service (MP-1)	31.62	19.00
Municipal Pumping Service (MP-2)	129.44	22.00
Municipal Pumping Service at 103%	140.56	19.00
Commercial Demand/General Secondary	127.46	15.00
Commercial Demand Primary Metered	356.81	16.00
Primary Service High Load Factor	376.50	50.00
Primary Interruptible	424.72	50.00
Metal Melting	621.62	40.00

Utility Financial Solutions
185 Sun Meadow Ct.
Holland, MI 49424
Phone: 616-393-9722
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Accountant's Compilation Report

Governing Body
Traverse City Light & Power

The accompanying forecasted statements of revenues and expenses of the Traverse City Light & Power (utility) were compiled for the year ending December 31, FY 2018 - 2019 in accordance with guidelines established by the American Institute of Certified Public Accountants.

The purpose of this report is to assist management in forecasting revenue requirements and determining the cost to service each customer class. This report should not be used for any other purpose.

A compilation is limited to presenting, in the form of a forecast; information represented by management and does not include evaluation of support for any assumptions used in projecting revenue requirements. We have not audited the forecast and, accordingly, do not express an opinion or any other form of assurance on the statements or assumptions accompanying this report.

Differences between forecasted and actual results will occur since some assumptions may not materialize and events and circumstances may occur that were not anticipated. Some of these variations may be material. Utility Financial Solutions has no responsibility to update this report after the date of this report.

This report is intended for information and use by the governing body and management for the purposes stated above. This report is not intended to be used by anyone except the specified parties.

UTILITY FINANCIAL SOLUTIONS

Mark Beauchamp, CPA, CMA, MBA
Holland, MI
April 2018

Appendix A – Rate Design

This Appendix details the rates for the test year for major customer classes

TCL&P
Rate Design

4/6/2018

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Submitted Respectfully by:
Mark Beauchamp, CPA, CMA, MBA
President, Utility Financial Solutions



TCL&P
Rate Design
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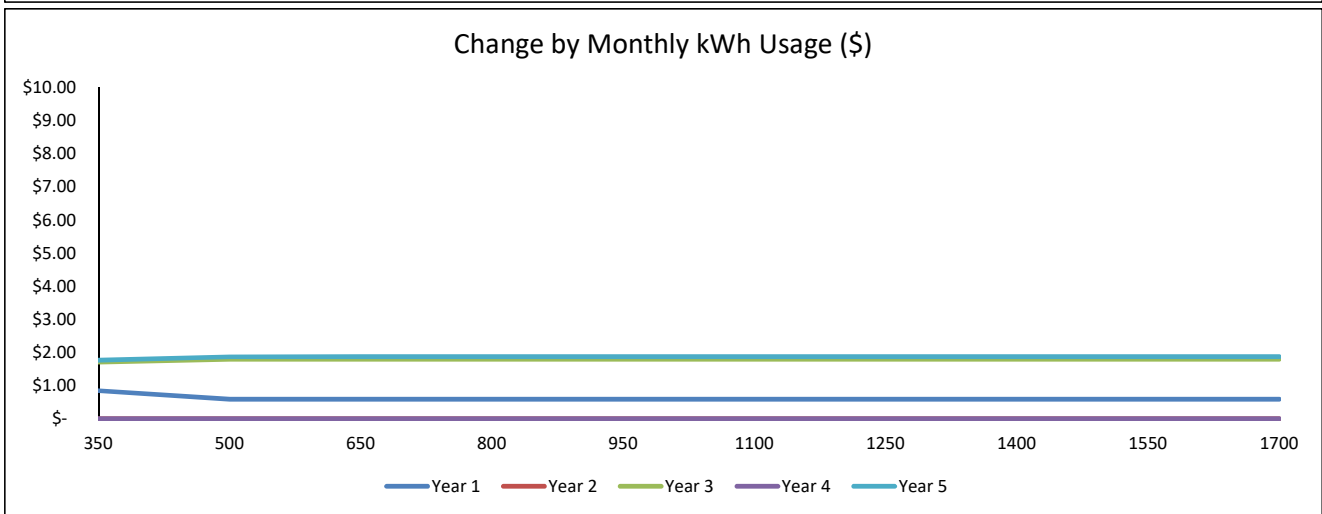
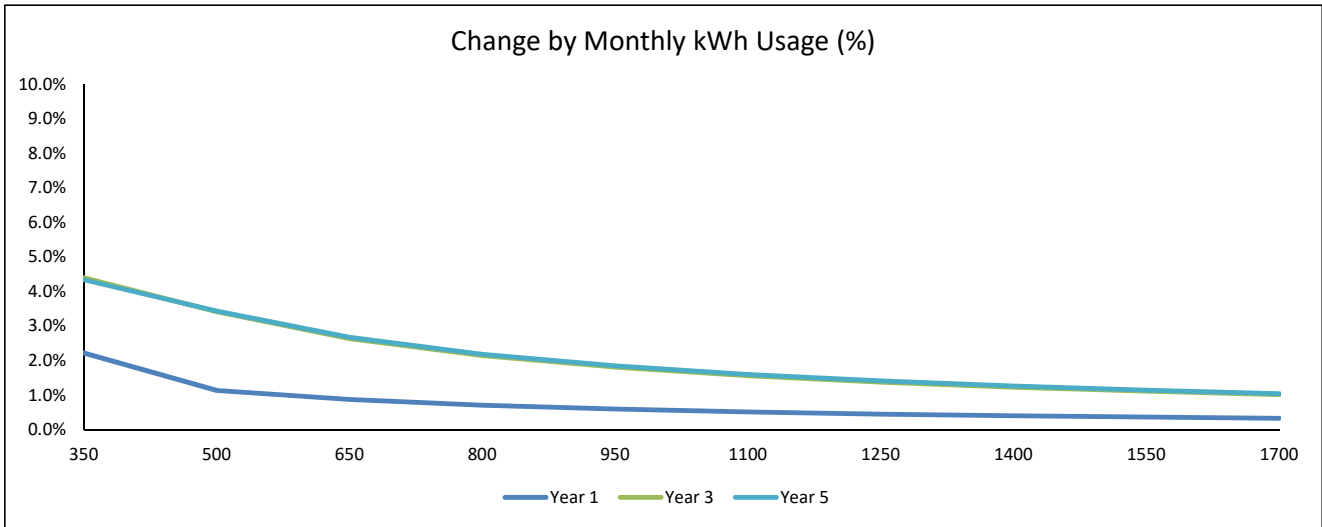
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TCL&P
Rate Design
Rate Design Summary

Customer Class	Projected Revenues Under Current Rates	Projected Revenues Under Proposed Rates Year 1	Projected Revenues Under Proposed Rates Year 2	Projected Revenues Under Proposed Rates Year 3	Projected Revenues Under Proposed Rates Year 4	Projected Revenues Under Proposed Rates Year 5
Residential	\$ 4,893,847	\$ 5,219,113	\$ 5,219,113	\$ 5,375,686	\$ 5,375,686	\$ 5,536,957
Residential Water Heater	273,591					
Residential Space Heat	105,357	106,542	106,542	109,745	109,745	113,040
Senior Citizen	625,173	628,786	628,786	715,798	715,798	737,756
Senior Water Heater	49,385	50,509	51,035			
Senior Space Heat	17,257					
Residential Life Support	17,831	17,990	17,990	18,379	18,379	18,778
Residential Senior Life Support	7,980	8,060	8,060	8,375	8,375	8,626
Commercial/General	4,038,103	3,977,647	3,977,647	4,028,859	4,028,859	4,264,380
Commercial Electric Heat and Air Conditioning	162,049	168,872	168,872	177,202	177,202	
Commercial and Industrial Water Heating Service	1,602	1,708	1,777	1,894	1,964	
Municipal Pumping Service (MP-1)	59,148	59,135	59,135	60,023	60,023	60,923
Municipal Pumping Service (MP-2)	174,293	232,304	232,304	239,273	239,273	246,451
Municipal Pumping Service at 103%	55,707					
Commercial Demand/General Secondary	10,197,762	10,197,762	10,197,762	10,401,717	10,401,717	10,609,751
Commercial Demand Primary Metered	178,810	178,732	178,732	180,992	180,992	183,346
Primary Service High Load Factor	7,521,378	8,020,595	8,020,595	8,142,735	8,142,735	8,268,623
Primary Interruptible	499,342					
Metal Melting	1,762,762	1,771,503	1,771,503	1,806,813	1,806,813	1,842,123
Totals	\$ 30,641,377	\$ 30,639,328	\$ 30,639,925	\$ 31,267,466	\$ 31,267,536	\$ 31,890,710

TCL&P
Electric Rate Design
 Projected Residential Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 6.00	\$ 7.50	\$ 7.50	\$ 9.00	\$ 9.00	\$ 10.50
Energy Charge:						
Block 1 (0 - 16 kWh per day)	\$ 0.0940	\$ 0.0921	\$ 0.0921	\$ 0.0928	\$ 0.0928	\$ 0.0935
Block 2 (Excess)	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 4,893,847	\$ 5,219,113	\$ 5,219,113	\$ 5,375,686	\$ 5,375,686	\$ 5,536,957
Change from Previous		1.0%	0.0%	3.0%	0.0%	3.0%



TCL&P

Electric Rate Design

Consolidated Residential Water Heater Rates

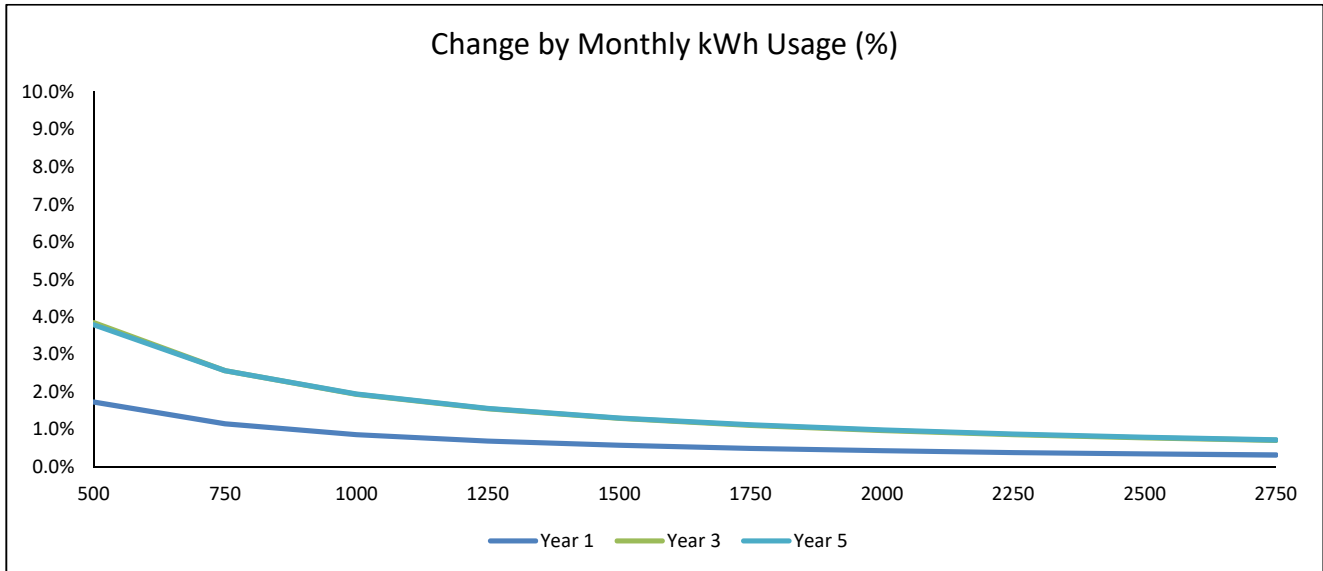
Rates	Residential Rate					
	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 6.00	\$ 7.50	\$ 7.50	\$ 9.00	\$ 9.00	\$ 10.50
Energy Charge:						
Block 1 (0 - 29 kWh per day)	\$ 0.09400	\$ 0.09214	\$ 0.09214	\$ 0.09277	\$ 0.09277	\$ 0.09354
Block 2 (Excess)	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)

TCL&P

Electric Rate Design

Consolidated Residential Space Heat Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 6.00	\$ 7.50	\$ 7.50	\$ 9.00	\$ 9.00	\$ 10.50
Energy Charge:						
Winter Block 1 (0 - 480 kWh)	\$ 0.09200	\$ 0.09092	\$ 0.09092	\$ 0.09196	\$ 0.09196	\$ 0.09309
Winter Block 2 (Excess)	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550
Summer Block 1 (0 - 480 kWh)	\$ 0.09200	\$ 0.09092	\$ 0.09092	\$ 0.09196	\$ 0.09196	\$ 0.09309
Summer Block 2 (Excess)	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550	\$ 0.10550
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 105,357	\$ 106,542	\$ 106,542	\$ 109,745	\$ 109,745	\$ 113,040
Change from Previous		1.1%	0.0%	3.0%	0.0%	3.0%



TCL&P

Electric Rate Design

Projected Senior Citizen Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 5.00	\$ 7.50	\$ 7.50	\$ 8.50	\$ 8.50	\$ 9.00
Senior Discount		\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00
Energy Charge:						
Block 1 (0 - 480 kWh)	\$ 0.07700	\$ 0.0829	\$ 0.0829	\$ 0.0836	\$ 0.0836	\$ 0.0860
Block 2 (481 - 522 kWh)	\$ 0.12290	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Block 3 (Excess)	\$ 0.10550	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 625,173	\$ 628,786	\$ 628,786	\$ 715,798	\$ 715,798	\$ 737,756
Change from Previous		-2.1%	0.0%	5.3%	0.0%	3.1%

Chart Data (\$ Change)	Year 1	Year 2	Year 3	Year 4	Year 5
100	\$ 0.09	\$ -	\$ 1.07	\$ -	\$ 0.73
200	\$ 0.68	\$ -	\$ 1.14	\$ -	\$ 0.97
300	\$ 1.27	\$ -	\$ 1.22	\$ -	\$ 1.20
400	\$ 1.86	\$ -	\$ 1.29	\$ -	\$ 1.43
500	\$ 1.98	\$ -	\$ 1.34	\$ -	\$ 1.62
600	\$ 1.60	\$ -	\$ 1.34	\$ -	\$ 1.62
700	\$ 1.60	\$ -	\$ 1.34	\$ -	\$ 1.62
800	\$ 1.60	\$ -	\$ 1.34	\$ -	\$ 1.62
900	\$ 1.60	\$ -	\$ 1.34	\$ -	\$ 1.62
1000	\$ 1.60	\$ -	\$ 1.34	\$ -	\$ 1.62

TCL&P

Electric Rate Design

Consolidated Senior Water Heater Rates

Rates	Senior Rate					
	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 5.00	\$ 7.50	\$ 7.50	\$ 8.50	\$ 8.50	\$ 9.00
Senior Discount		\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00
Energy Charge:						
Block 1 (0 - 29 kWh per da	\$ 0.08070	\$ 0.0829	\$ 0.0829	\$ 0.0836	\$ 0.0836	\$ 0.0860
Block 2 (Excess)	\$ 0.10550	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Power Cost Adjustment	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 49,385	\$ 50,509	\$ 51,035	\$ 53,004	\$ 53,004	\$ 54,626
Change from Previous		2.3%	1.0%	3.9%	0.0%	3.1%

TCL&P

Electric Rate Design

Consolidated Senior Space Heat Rates

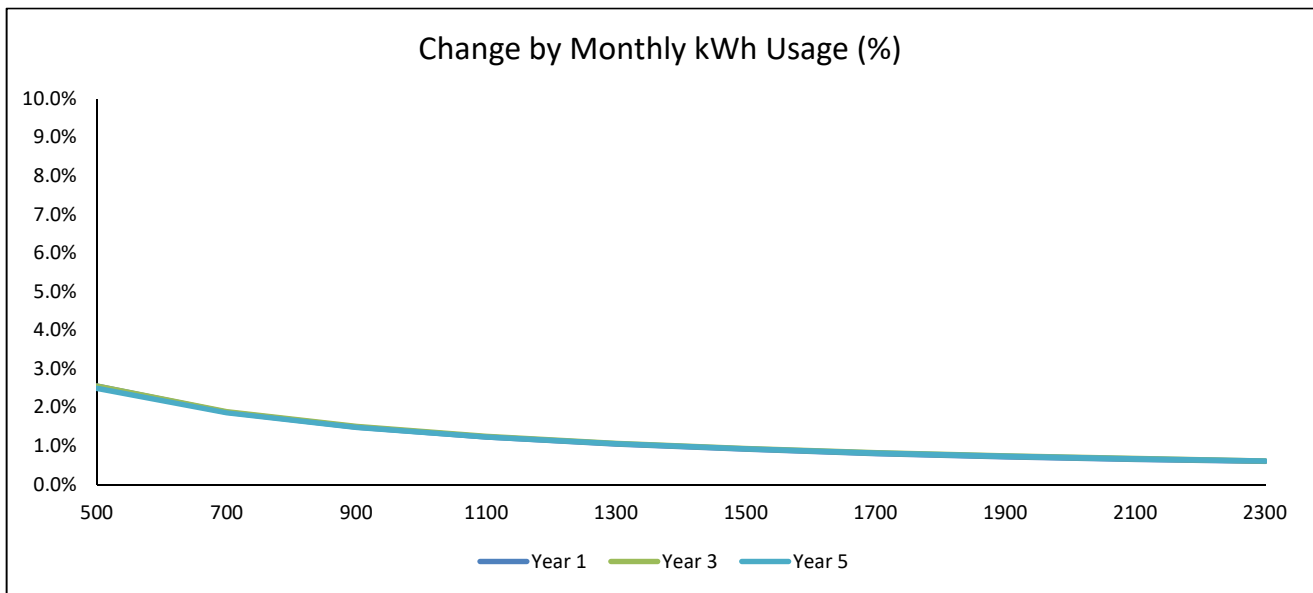
Rates	Current	Senior Rate				
		Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 5.00	\$ 7.50	\$ 7.50	\$ 8.50	\$ 8.50	\$ 9.00
Senior Discount		\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00
Energy Charge:						
Winter Block 1 (0 - 488 kWh)	\$ 0.09200	\$ 0.0829	\$ 0.0829	\$ 0.0836	\$ 0.0836	\$ 0.0860
Winter Block 2 (Excess)	\$ 0.09200	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Summer Block 1 (0 - 488 kWh)	\$ 0.09400	\$ 0.0829	\$ 0.0829	\$ 0.0836	\$ 0.0836	\$ 0.0860
Summer Block 2 (Excess)	\$ 0.10550	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055	\$ 0.1055
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)

TCL&P

Electric Rate Design

Projected Residential Life Support Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 4.80	\$ 6.00	\$ 6.00	\$ 7.20	\$ 7.20	\$ 8.40
Energy Charge:						
Block 1 (0 - 16 kWh per da	\$ 0.07520	\$ 0.0737	\$ 0.0737	\$ 0.0742	\$ 0.0742	\$ 0.0748
Block 2 (Excess)	\$ 0.08440	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 17,831	\$ 17,990	\$ 17,990	\$ 18,379	\$ 18,461	\$ 18,778
Change from Previous		0.9%	0.0%	2.2%	0.0%	2.2%



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Electric Rate Design

Projected Residential Senior Life Support Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 4.00	\$ 6.00	\$ 6.00	\$ 6.80	\$ 6.80	\$ 7.20
Senior Discount		\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00
Energy Charge:						
Block 1 (0 - 480 kWh per day)	\$ 0.06160	\$ 0.0663	\$ 0.0663	\$ 0.0669	\$ 0.0669	\$ 0.0688
Block 2 (16 - 33kWh per day)	\$ 0.09832	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844
Block 3 (Excess)	\$ 0.08440	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844	\$ 0.0844
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0015)	\$ (0.0015)
Revenue from Rate	\$ 7,980	\$ 8,060	\$ 8,131	\$ 8,375	\$ 8,375	\$ 8,626
Change From Previous		1.9%	0.0%	2.7%	0.0%	2.7%

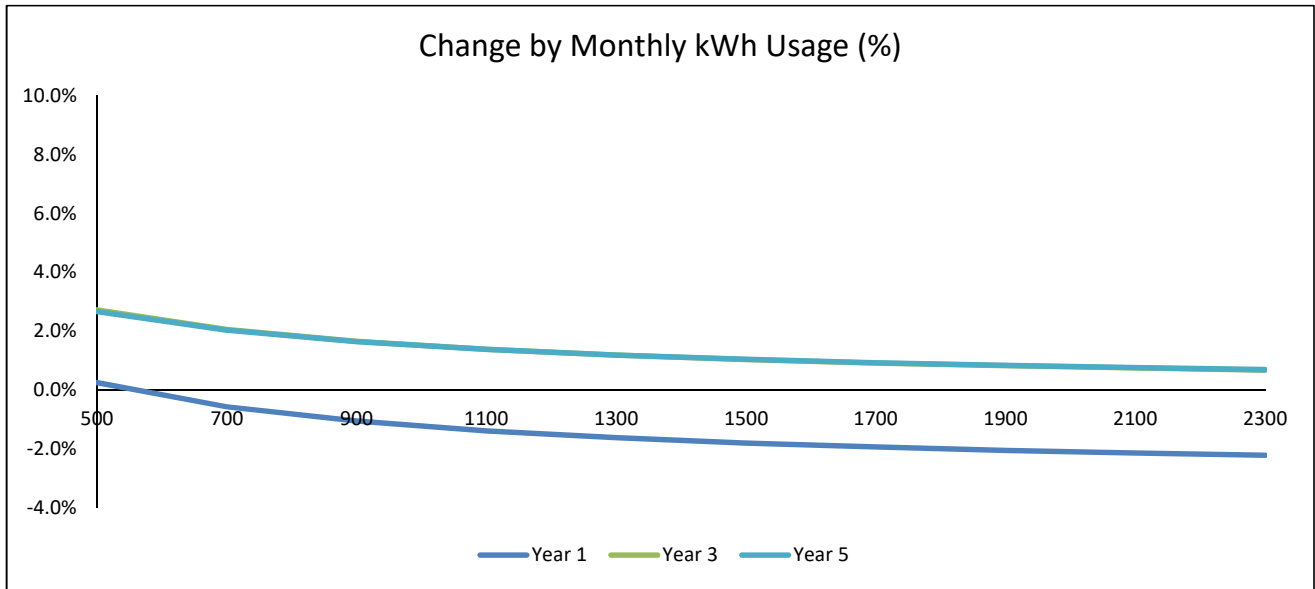
Chart Data (\$ Change)	Year 1	Year 2	Year 3	Year 4	Year 5
100	\$ (0.49)	\$ -	\$ 0.86	\$ -	\$ 0.59
200	\$ 0.02	\$ -	\$ 0.92	\$ -	\$ 0.78
300	\$ 0.53	\$ -	\$ 0.98	\$ -	\$ 0.97
400	\$ 1.03	\$ -	\$ 1.04	\$ -	\$ 1.16
500	\$ 1.54	\$ -	\$ 1.10	\$ -	\$ 1.35
600	\$ 2.05	\$ -	\$ 1.16	\$ -	\$ 1.54
700	\$ 2.56	\$ -	\$ 1.22	\$ -	\$ 1.73
800	\$ 3.07	\$ -	\$ 1.28	\$ -	\$ 1.92
900	\$ 3.58	\$ -	\$ 1.34	\$ -	\$ 2.11
1000	\$ 4.09	\$ -	\$ 1.40	\$ -	\$ 2.30

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Electric Rate Design

Projected Commercial/General Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 13.00	\$ 15.00	\$ 15.00	\$ 17.00	\$ 17.00	\$ 19.00
Energy Charge:						
All Energy	\$ 0.1211	\$ 0.1175	\$ 0.1175	\$ 0.1174	\$ 0.1174	\$ 0.1174
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 4,038,103	\$ 3,977,647	\$ 3,977,647	\$ 4,028,859	\$ 4,028,859	\$ 4,264,380
Change from Previous		-1.5%	0.0%	1.3%	0.0%	1.3%



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Electric Rate Design

Consolidated Commercial Electric Heat and Air Conditioning Rates

Rates							Commercial Rate
	Current	Year 1	Year 2	Year 3	Year 4	Year 5	
Monthly Facilities Charge:							
All Customers	\$ 13.00	\$ 15.00	\$ 15.00	\$ 17.00	\$ 17.00	\$ 19.00	
Energy Charge:							
All Energy	\$ 0.1060	\$ 0.1100	\$ 0.1100	\$ 0.1150	\$ 0.1150	\$ 0.1174	
Power Cost Adjustment:							
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	
Revenue from Rate	\$ 162,049	\$ 168,872	\$ 168,872	\$ 177,202	\$ 177,202	\$ 181,630	
Change from Previous		4.2%	0.0%	4.9%	0.0%	2.5%	

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Electric Rate Design

Consolidated Commercial and Industrial Water Heating Service Rates

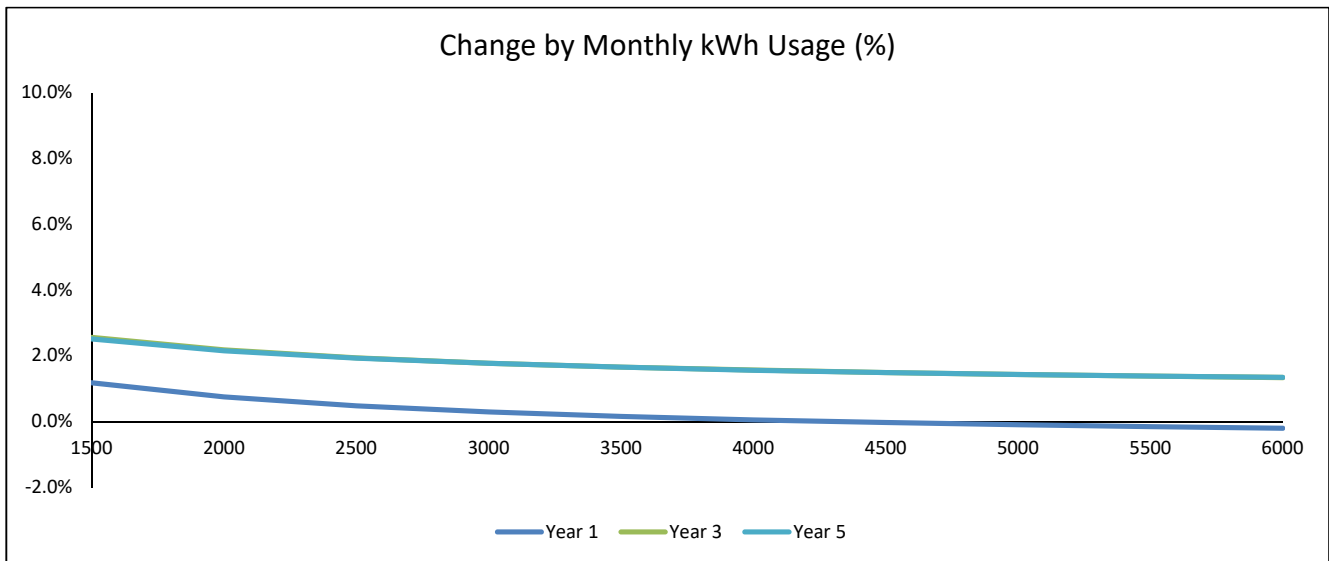
Rates							Commercial Rate
	Current	Year 1	Year 2	Year 3	Year 4	Year 5	
Monthly Facilities Charge:							
All Customers	\$ 11.75	\$ 15.00	\$ 15.00	\$ 17.00	\$ 17.00	\$ 19.00	
Energy Charge:							
All Energy	\$ 0.0970	\$ 0.0990	\$ 0.1040	\$ 0.1090	\$ 0.1140	\$ 0.1174	
Power Cost Adjustment:							
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	
Revenue from Rate	\$ 1,602	\$ 1,708	\$ 1,777	\$ 1,894	\$ 1,964	\$ 2,059	
Change from Previous		6.6%	4.1%	6.6%	3.7%	4.9%	

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Electric Rate Design

Projected Municipal Pumping Service (MP-1) Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 19.00	\$ 22.00	\$ 22.00	\$ 25.00	\$ 25.00	\$ 28.00
Energy Charge:						
All Energy	\$ 0.0990	\$ 0.0983	\$ 0.0983	\$ 0.0991	\$ 0.0991	\$ 0.1000
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 59,148	\$ 59,135	\$ 59,135	\$ 60,023	\$ 60,023	\$ 60,923
Change from Previous		0.0%	0.0%	1.5%	0.0%	1.5%

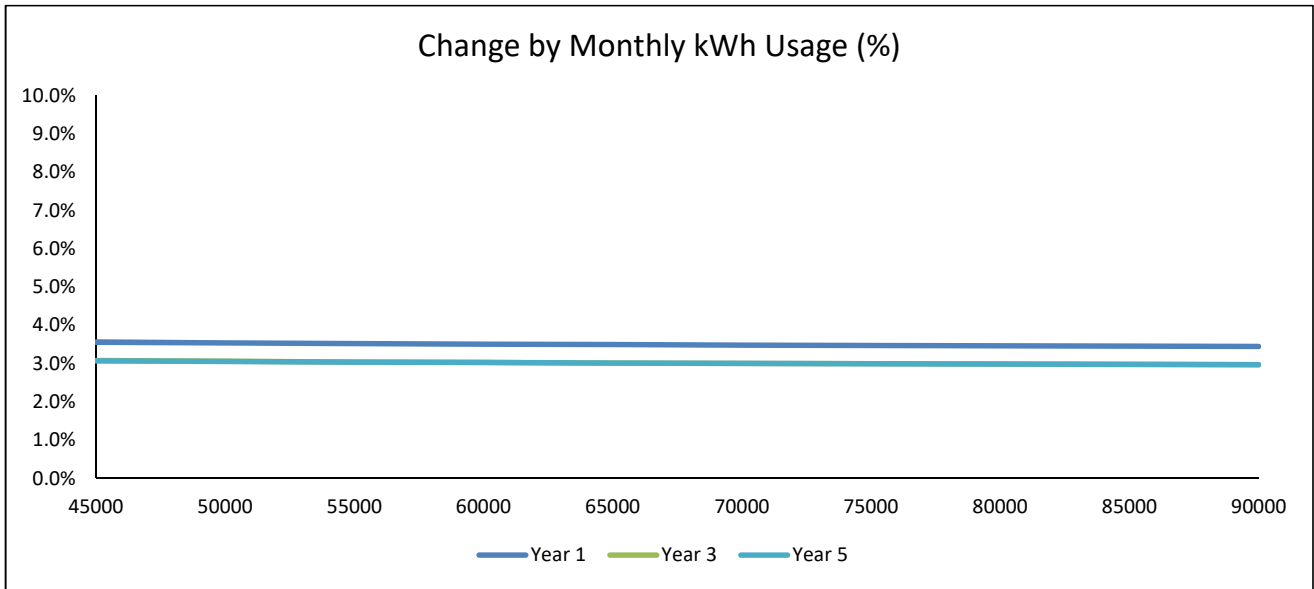


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Electric Rate Design

Projected Municipal Pumping Service (MP-2) Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 22.00	\$ 32.00	\$ 32.00	\$ 42.00	\$ 42.00	\$ 52.00
Energy Charge:						
All Energy	\$ 0.0920	\$ 0.0950	\$ 0.0950	\$ 0.0977	\$ 0.0977	\$ 0.1004
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 174,293	\$ 232,304	\$ 232,304	\$ 239,273	\$ 239,273	\$ 246,451
Change from Previous		1.0%	0.0%	3.0%	0.0%	3.0%



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Electric Rate Design

Consolidated Municipal Pumping Service at 103% Rates

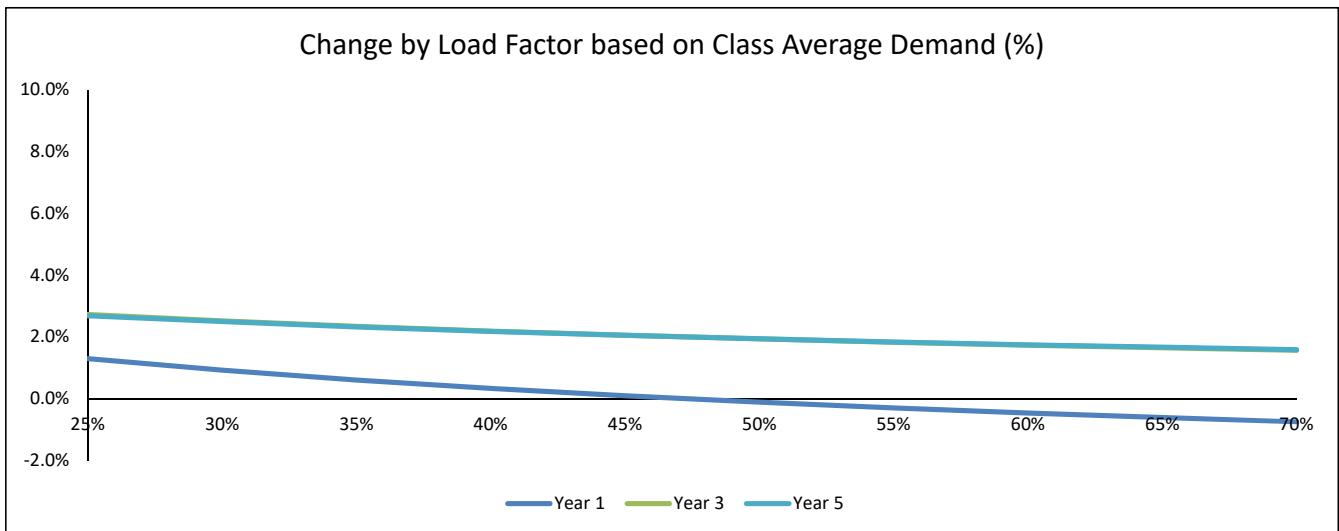
Rates	Current	MP-2 Rate				
		Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 19.00	\$ 32.00	\$ 32.00	\$ 42.00	\$ 42.00	\$ 52.00
Energy Charge:						
All Energy	\$ 0.10200	\$ 0.0950	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)

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Electric Rate Design

Projected Commercial Demand/General Secondary Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
Monthly Charge	\$ 15.00	\$ 20.00	\$ 20.00	\$ 25.00	\$ 25.00	\$ 30.00
Energy Charge:						
All Energy	\$ 0.0590	\$ 0.0571	\$ 0.0571	\$ 0.0571	\$ 0.0571	\$ 0.0571
Demand Charge						
All Demand	\$ 12.95	\$ 13.45	\$ 13.45	\$ 13.95	\$ 13.95	\$ 14.45
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 10,197,762	\$ 10,197,762	\$ 10,197,762	\$ 10,401,717	\$ 10,401,717	\$ 10,609,751
Change from Previous		0.0%	0.0%	2.0%	0.0%	2.0%

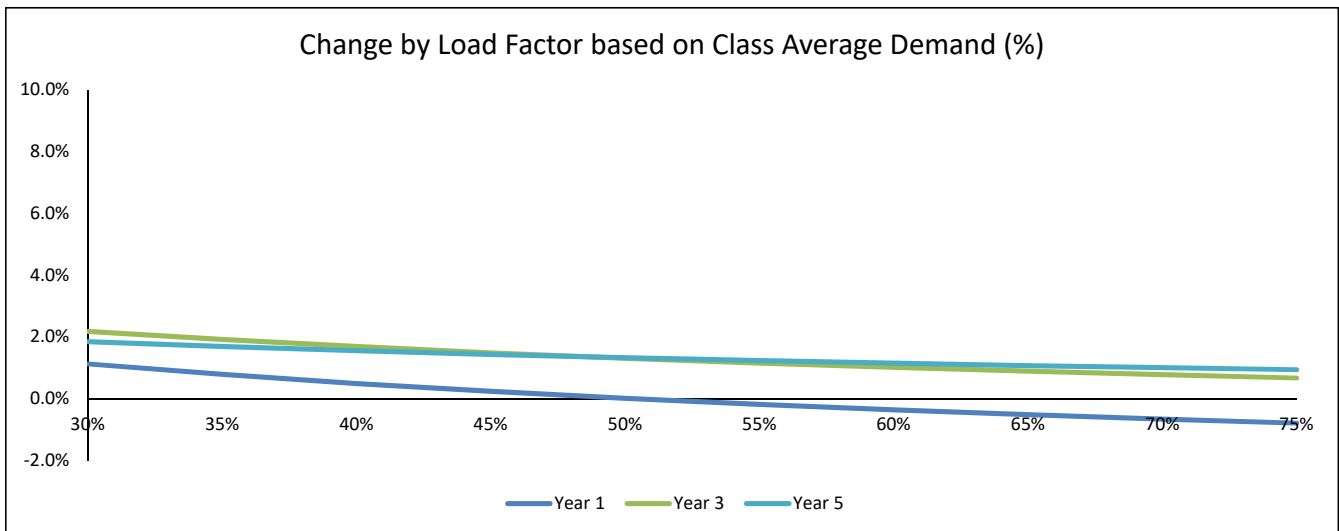


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Electric Rate Design

Projected Commercial Demand Primary Metered Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
Monthly Charge	\$ 16.00	\$ 20.00	\$ 20.00	\$ 25.00	\$ 25.00	\$ 30.00
Energy Charge:						
All Energy	\$ 0.0581	\$ 0.0562	\$ 0.0562	\$ 0.0554	\$ 0.0554	\$ 0.0552
Demand Charge						
All Demand	\$ 12.57	\$ 13.25	\$ 13.25	\$ 13.95	\$ 13.95	\$ 14.45
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 178,810	\$ 178,732	\$ 178,732	\$ 180,992	\$ 180,992	\$ 183,346
Change from Previous		0.0%	0.0%	1.3%	0.0%	1.3%

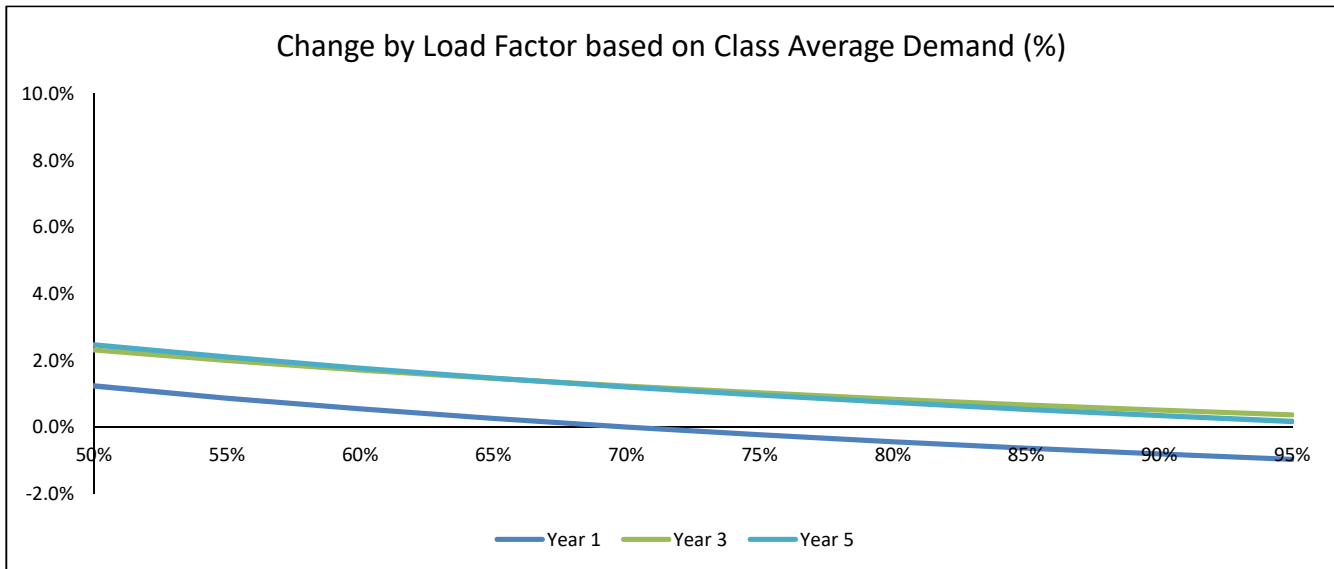


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Electric Rate Design

Projected Primary Service High Load Factor Rates

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 50.00	\$ 100.00	\$ 100.00	\$ 150.00	\$ 150.00	\$ 200.00
Energy Charge:						
Winter On Peak	\$ 0.0660	\$ 0.0643	\$ 0.0643	\$ 0.0626	\$ 0.0626	\$ 0.0604
Winter Off Peak	\$ 0.0550	\$ 0.0523	\$ 0.0523	\$ 0.0506	\$ 0.0506	\$ 0.0484
Summer On Peak	\$ 0.0680	\$ 0.0643	\$ 0.0643	\$ 0.0626	\$ 0.0626	\$ 0.0604
Summer Off Peak	\$ 0.0550	\$ 0.0523	\$ 0.0523	\$ 0.0506	\$ 0.0506	\$ 0.0484
Demand Charge:						
All Demand	\$ 11.00	\$ 12.25	\$ 12.25	\$ 13.50	\$ 13.50	\$ 15.00
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 7,521,378	\$ 8,020,595	\$ 8,020,595	\$ 8,142,735	\$ 8,142,735	\$ 8,268,623
Change from Previous		0.0%	0.0%	1.5%	0.0%	1.5%



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Electric Rate Design

Consolidated Primary Interruptible Rates

Rates	Current	PHLF Rate				
		Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 50.00	\$ 100.00	\$ 100.00	\$ 150.00	\$ 150.00	\$ 200.00
Energy Charge:						
Winter On Peak	\$ 0.0660	\$ 0.0643	\$ 0.0643	\$ 0.0626	\$ 0.0626	\$ 0.0604
Winter Off Peak	\$ 0.0600	\$ 0.0523	\$ 0.0523	\$ 0.0506	\$ 0.0506	\$ 0.0484
Summer On Peak	\$ 0.0680	\$ 0.0643	\$ 0.0643	\$ 0.0626	\$ 0.0626	\$ 0.0604
Summer Off Peak	\$ 0.0600	\$ 0.0523	\$ 0.0523	\$ 0.0506	\$ 0.0506	\$ 0.0484
Demand Charge:						
All Demand	\$ 11.00	\$ 12.25	\$ 12.25	\$ 13.50	\$ 13.50	\$ 15.00
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)

TCL&P
Electric Rate Design
 Metal Melting

Rates	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Monthly Facilities Charge:						
All Customers	\$ 40.00	\$ 55.00	\$ 55.00	\$ 70.00	\$ 70.00	\$ 85.00
Energy Charge:						
Winter On Peak	\$ 0.06400	\$ 0.06360	\$ 0.06360	\$ 0.06320	\$ 0.06320	\$ 0.06280
Winter Off Peak	\$ 0.05000	\$ 0.04760	\$ 0.04760	\$ 0.04720	\$ 0.04720	\$ 0.04680
Summer On Peak	\$ 0.06700	\$ 0.06360	\$ 0.06360	\$ 0.06320	\$ 0.06320	\$ 0.06280
Summer Off Peak	\$ 0.05000	\$ 0.04760	\$ 0.04760	\$ 0.04720	\$ 0.04720	\$ 0.04680
Demand Charge:						
All Demand	\$ 8.48	\$ 10.00	\$ 10.00	\$ 11.00	\$ 11.00	\$ 12.00
Power Cost Adjustment:						
All Energy	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)	\$ (0.0019)
Revenue from Rate	\$ 1,762,762	\$ 1,771,503	\$ 1,771,503	\$ 1,806,813	\$ 1,806,813	\$ 1,842,123
Change from Previous		0.5%	0.0%	2.0%	0.0%	2.0%

