

**Final Report**

# **HEBER LIGHT & POWER**

**Electric Impact Fee Analysis**

September 2019

**UFS**  
Utility Financial Solutions, LLC

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

Rate Design and Financial Analysis



September 2019

Jason Norlen  
General Manager  
Heber Light & Power  
31 South 100 West  
Heber, UT 84032

Dear Mr. Norlen:

We are pleased to present a final report for the Impact Fee Analysis for Heber Light & Power (HLP). This report was prepared to provide HLP with a comprehensive examination of its existing impact fee structure by an outside party.

The specific purposes of this rate study are:

- Identify the fixed cost contributions to plant a new customer provides through electric rate tariffs
- Identify gross investment in plant necessary to service new growth at various sizes and voltages
- Determine impact fees by subtracting the present value of the fixed cost contributions from the impacts on plant

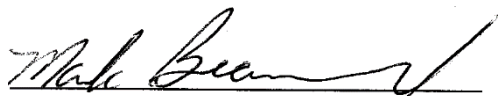
This report utilizes results of the electric cost of service study, financial projections performed in 2018 and HLP's capital improvement plan.

The impact fee analysis and supporting calculations include the following:

1. includes only the costs of public facilities that are
  - a. allowed under the Impact Fees Act; and
  - b. actually incurred; or projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
  - c. costs of operation and maintenance of public facilities;
  - d. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or
  - e. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement;
3. offsets costs with grants or other alternate sources of payment; and
4. complies in each and every relevant respect with the Impact Fees Act."

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", written over a horizontal line.

Utility Financial Solutions, LLC

Mark Beauchamp

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## **Introduction**

This report identifies the impact fees Heber Light & Power should charge to new customers by identifying the amount new customers contribute to system expansion through rates and subtracting the costs for expansion of the system. The purpose of this analysis is to help ensure:

- New customers are not subsidizing existing customers.
- Existing customers are not subsidizing new customers.

This analysis helps ensure growth will benefit all customers in the system and not be adversely impacted by rate increases due to growth of the system. Growth causes additional capacity investments that often occur intermittently, and funds generated through impact fees are used to fund the expansions. As new customers are added to the system, HLP receives contribution margins through rates to fund a portion of the fixed infrastructure costs. Rates are set based on recovery of historical costs and margins generated by new customers are not sufficient to fund expansions of the system with new investments.

## **Steps to Complete the Analysis**

The following steps were taken to complete the impact fee analysis:

- 1) Contribution margins generated by the rate tariffs and used to fund fixed infrastructure investments were identified (Net Revenue).
- 2) The contribution margins were present valued over an appropriate period to determine the current value of the margins. A six percent discount rate is used throughout this report.
- 3) Plant investments to provide service to new customers were identified.
- 4) Total system cost impacts are calculated and maximum utility investment is subtracted to determine the impact fee by class.
- 5) Class impact fees are converted to amperage by voltage level.

## Step One – Determination of Contribution Margin

Contribution margins were calculated for each class by subtracting identified variable costs from the cost to provide service to the class.

### Revenue minus variable cost equals contribution margin

Table 1 identifies the expense allocated to each class of customers from the cost of service study. Variable costs are primarily driven by power supply and transmission costs, and distribution system costs are classified as fixed cost used to fund operation, maintenance, replacement, and expansion of the system. Table 1 below identifies the total recovery of distribution operations for each class with the residential class generating \$4.9M, Small Commercial, \$930k, Medium Commercial, \$1.14M, and Large Commercial, \$644k.

**Table 1 – Contribution Margin by Class**

Expense Description	Expense Classification	Residential	Small Commercial	Medium Commercial	Large Commercial
<b>Power Supply Expenses:</b>					
Summer Demand	Variable	\$ 1,259,119	\$ 161,884	\$ 229,412	\$ 130,766
Summer Energy	Variable	390,987	75,337	120,489	85,255
Winter Demand	Variable	814,816	159,358	230,947	107,979
Winter Energy	Variable	756,843	174,768	306,758	151,554
Inter 2 Demand	Variable	554,693	94,609	99,841	68,603
Inter 2 Energy	Variable	308,076	70,962	117,342	82,187
Inter 4 Demand	Variable	478,103	170,477	218,024	126,708
Inter 4 Energy	Variable	588,459	147,730	261,528	151,642
<b>Distribution Expenses:</b>					
Distribution	Fixed	1,994,003	368,163	424,810	240,729
Transmission	Fixed	1,258,552	243,598	321,889	179,307
Transformer	Fixed	128,647	10,469	14,106	8,105
Substation	Fixed	1,389,854	272,640	367,368	211,087
<b>Customer Related Expenses:</b>					
Distribution Customer Costs	Included in Customer Investment	288,281	82,000	35,189	10,229
Transformer Customer Costs	Included in Customer Investment	504,935	143,626	61,636	17,917
Substation Customer Costs	Included in Customer Investment	173,924	49,472	21,230	6,172
Meter O&M	Included in Customer Investment	102,862	14,629	2,511	631
Meter Reading	Variable	139,631	39,717	3,409	396
Billing	Variable	526,019	149,623	64,209	18,665
Customer Service	Fixed	125,041	35,567	15,263	4,437
<b>Total Cost of Service</b>		<b>\$ 11,782,845</b>	<b>\$ 2,464,627</b>	<b>\$ 2,915,961</b>	<b>\$ 1,602,373</b>
<b>Total Fixed</b>		<b>\$ 4,896,097</b>	<b>\$ 930,437</b>	<b>\$ 1,143,436</b>	<b>\$ 643,665</b>

## Step Two - Contribution Margin Unit Conversion

The contribution to margin (Net Revenue) is present valued over a specified time period to determine the maximum contribution for each customer class and shown on a per kWh or kW basis. Table 2 shows the average net revenue for each customer class on a per kWh or kW basis. For example, for each kWh of sales to the residential class, 5.14 cents is used to fund the distribution system.

**Table 2 – Determination of Present Value of Contribution Margins**

Customer Class	Recovery Period (Years)	Alloc Basis	1	2	3	4	5	6	7
<i>Investment Calculator (Fixed Cost Contribution / # of Units)</i>									
Residential	7	per kWh	\$ 0.0514	\$ 0.0514	\$ 0.0514	\$ 0.0514	\$ 0.0514	\$ 0.0514	\$ 0.0514
Small Commercial	5	per kW	9.74	9.74	9.74	9.74	9.74	-	-
Medium Commercial	5	per kW	10.11	10.11	10.11	10.11	10.11	-	-
Large Commercial	5	per kW	9.87	9.87	9.87	9.87	9.87	-	-

Table 3 details the value of the contribution margins by customer class. The value of the fixed cost recovery for a typical residential customer is \$2,586. Due to variations in customer usages within the small, medium, and large commercial classes, the utility investment is best expressed on a per kW basis multiplied by the projected annual kW demands for that customer. For example, a small commercial customer’s value is \$41.02 per kW times the projected annual demands of the new customer. The maximum utility investment per customer are then subtracted from the cost impacts of new infrastructure (identified in the next section).

**Table 3 – Average Contribution Margin per Billing Basis**

Customer Class	COS Revenue Requirement	Fixed Costs Contribution	Recovery Period (Years)	Utility Investment	Maximum Utility Investment per Customer
Residential	\$ 11,782,845	\$ 4,896,097	7	\$ 0.2870 per kWh	\$ 2,586
Small Commercial	2,464,627	930,437	5	41.02 per kW	2,608
Medium Commercial	2,915,961	1,143,436	5	42.59 per kW	37,338
Large Commercial	1,602,373	643,665	5	41.57 per kW	180,757

### Step Three - Infrastructure Cost Analysis

The determination of impact fees depends on the additional capacity needed to service new load and is expressed by amperage and voltage requirements. The infrastructure costs are broken down into the following components:

- Distribution Local
- Distribution Substation
- System Substations
- Transmission System

HLP provided a capacity plan for the total system with a breakout of the amount attributed to expansion due to growth. The table below outlines the projected HLP investments in plant, the additional capacity provided by the investments, the expansion costs on a per kW basis, and the location of the capacity investment. “Distribution local” are investments made to service customers peak demands, “distribution substation” are investments made to service area peaks, and “system substations” and “transmission system” are investments made to handle HLP’s peak demands. Table 4 is used to identify the cost impacts associated with each type of cost component.

**Table 4 – Cost of Additional Investment in Plant**

<b>Cost Component</b>	<b>Costs</b>	<b>Additional Capacity</b>	<b>Optimal to Base Loading</b>	<b>Cost per kW</b>	<b>Allocation</b>
Distribution Local	2,010,200	7,600	0.79	334.07	Customer Demand
Distribution Substation	10,502,608	48,800	0.79	271.82	Class NCP
System Substations	8,069,500	120,000	0.79	84.93	CP
Transmission System	9,624,000	126,000	0.79	96.47	CP

Customer Demand = Peaks created by customers

NCP = Area or Class Peak Demands

CP = System Peak Demands



## Step Four – Determine Cost Impact by Class

The cost of service study provided information on each class’ demand impacts on various portions of the electric system and the capacity needs for a new customer within each class.

### Residential Class Example

The average residential customer creates a peak demand of 9.54 kW on local infrastructure, 2.42 kW on substations and 2.38 kW on system substations and transmission systems. The expansion cost per kW (A. Rate per kW) is then multiplied by the capacity needs for an average residential customer to generate the cost impacts by component. For residential, the average cost impact is \$4,278 and the maximum utility contribution derived in Table 3 was subtracted to generate an average impact of \$1,691.

**Table 5 – Calculation of Impact Fees by Class**

	Residential	Small Commercial	Medium Commercial	Large Commercial
<b>A. Rate per kW</b>				
Distribution Local	\$ 334.07	\$ 334.07	\$ 334.07	\$ 334.07
Distribution Substation	271.82	\$ 271.82	\$ 271.82	\$ 271.82
System Substation	84.93	\$ 84.93	\$ 84.93	\$ 84.93
Transmission System	96.47	\$ 96.47	\$ 96.47	\$ 96.47
<b>B. Average Impacts</b>				
Distribution Local (NCP)	9.54	6.14	105.18	465.93
Distribution Substation (NCP)	2.42	3.95	64.55	327.65
System Substation (kW)	2.38	3.87	55.49	263.13
Transmission System (kW)	2.38	3.87	55.49	263.13
<b>Cost Impact by Component (A x B)</b>				
Distribution Local (NCP)	\$ 3,187	\$ 2,050	\$ 35,138	\$ 155,651
Distribution Substation (NCP)	659	1,073	17,545	89,061
System Substation (kW)	202	329	4,713	22,348
Transmission System (kW)	229	374	5,353	25,384
<b>Total Impact Cost</b>	<b>\$ 4,278</b>	<b>\$ 3,825</b>	<b>\$ 62,750</b>	<b>\$ 292,444</b>
<i>Less: Maximum Utility Contribution</i>	2,586	2,608	37,338	180,757
<b>Impact Fees to be Recovered</b>	<b>\$ 1,691</b>	<b>\$ 1,218</b>	<b>\$ 25,412</b>	<b>\$ 111,688</b>

## Step Five – Conversion to Amperage

Table 6 expresses the Table 5 results by Amperage and Voltage level using a typical residential customer’s 100 Amp, 120/240 Volt, as the base. The calculations result in an impact fee of \$70.47 per kVA. This figure represents an increase of approximately 22 percent from the current impact fees (\$57.80 per kVA).

**Table 6 – Impact Fees by Amperage and Voltage Level**

2020 Impact Fees	120/240 Volt	120/208 Volt	277/480 Volt
10 A	\$ 169	\$ 254	\$ 586
20 A	338	508	1,172
30 A	507	762	1,758
40 A	677	1,016	2,344
50 A	846	1,269	2,929
60 A	1,015	1,523	3,515
70 A	1,184	1,777	4,101
80 A	1,353	2,031	4,687
90 A	1,522	2,285	5,273
100 A	1,691	2,539	5,859
125 A	2,114	3,174	7,324
150 A	2,537	3,808	8,788
175 A	2,960	4,443	10,253
200 A	3,383	5,078	11,718
300 A	5,074	7,617	17,576
400 A	6,765	10,155	23,435
500 A	8,457	12,694	29,294
600 A	10,148	15,233	35,153

The formula for calculating the impact fee for a given service size is as follows:

Service size (in Amps)  
 multiplied by line-to-line voltage in kilovolts (kV = voltage divided by 1,000)  
 multiplied by a constant (1.000 for single-phase service, 1.732 for three-phase service)  
 multiplied by the impact fee per kilovolt-ampere (\$70.47 per kVA)  
 equals the impact fee due for that customer.

## Significant Assumptions

The following assumptions are made in the creation of this report:

- 1) **Discount Rate** – 6.0%
- 2) **Recovery Period:**
  - All Residential Services – 7 year recovery
  - Commercial – 5 year recovery

## Statistical Information

**Table 7 – Class Load Data and Statistics**

Description	Residential	Small Commercial	Medium Commercial	Large Commercial
Number of Customers	10,568	1,503	129	15
Energy at Meter	95,217,374	21,834,495	37,545,308	21,920,256
NCP Meter	24,317	4,876	6,736	3,829
NCP Primary	25,402	5,045	6,904	3,937
NCP Input	26,524	5,203	7,011	4,028
Annual LF	11%	27%	32%	36%
Group LF	42%	42%	51%	51%
Class Peak Factor	98%	98%	86%	80%
<b>Impacts on Local Distribution Lines</b>				
Total Class - Individual NCP	100,829	9,221	13,569	6,989
Average Customer NCP	9.54	6.14	105.18	465.93
<b>Impacts on Distribution Substations</b>				
Total Class NCP	25,614	5,933	8,326	4,915
Average Customer NCP	2.42	3.95	64.55	327.65
<b>Impacts on System Substations and Sub-Transmission Facilities</b>				
Total System CP	25,140	5,823	7,159	3,947
Average kW - System	2.38	3.87	55.49	263.13

## Considerations

Currently, new customers are not contributing enough to cover the cost of capacity upgrades to the system. The table below compares the current and proposed impact fees and has identified the need for a 22% adjustment.

**Table 8 – Single Phase 120/240 Voltage Recommended Impact Fees**

	Current 120/240 Volt	Proposed 120/240 Volt	Dollar Adjustment	Percent Adjustment
10 A	\$ 138.72	\$ 169.14	\$ 30.42	22%
20 A	277.43	338.27	60.84	22%
30 A	416.15	507.41	91.26	22%
40 A	554.86	676.54	121.68	22%
50 A	693.58	845.69	152.11	22%
60 A	832.29	1,014.82	182.53	22%
70 A	971.01	1,183.96	212.95	22%
80 A	1,109.72	1,353.09	243.37	22%
90 A	1,248.44	1,522.23	273.79	22%
100 A	1,387.15	1,691.36	304.21	22%
125 A	1,733.94	2,114.20	380.26	22%
150 A	2,080.73	2,537.05	456.32	22%
175 A	2,427.52	2,959.89	532.37	22%
200 A	2,774.30	3,382.72	608.42	22%
300 A	4,161.46	5,074.09	912.63	22%
400 A	5,548.61	6,765.45	1,216.84	22%
500 A	6,935.76	8,456.81	1,521.05	22%
600 A	8,322.91	10,148.17	1,825.26	22%
700 A	9,710.06	11,839.53	2,129.47	22%
800 A	11,097.22	13,530.90	2,433.68	22%
900 A	12,484.37	15,222.26	2,737.89	22%
1000 A	13,871.52	16,913.62	3,042.10	22%
1100 A		18,604.98		
1200 A		20,296.34		

**Table 9 – Three Phase 120/208 Voltage Recommended Impact Fees**

	<b>Current 120/208 Volt</b>	<b>Proposed 120/208 Volt</b>	<b>Dollar Adjustment</b>	<b>Percent Adjustment</b>
10 A	\$ 208.23	\$ 253.90	\$ 45.67	22%
20 A	416.45	507.77	91.32	22%
30 A	624.68	761.67	136.99	22%
40 A	832.91	1,015.55	182.64	22%
50 A	1,041.13	1,269.44	228.31	22%
60 A	1,249.36	1,523.32	273.96	22%
70 A	1,457.59	1,777.22	319.63	22%
80 A	1,665.81	2,031.09	365.28	22%
90 A	1,874.04	2,284.99	410.95	22%
100 A	2,082.27	2,538.87	456.60	22%
125 A	2,602.84	3,173.59	570.75	22%
150 A	3,123.40	3,808.31	684.91	22%
175 A	3,643.97	4,443.03	799.06	22%
200 A	4,164.54	5,077.74	913.20	22%
300 A	6,246.81	7,616.62	1,369.81	22%
400 A	8,329.07	10,155.49	1,826.42	22%
500 A	10,411.34	12,694.36	2,283.02	22%
600 A	12,493.61	15,233.23	2,739.62	22%
700 A	14,575.88	17,772.10	3,196.22	22%
800 A	16,658.15	20,310.98	3,652.83	22%
900 A	18,740.42	22,849.85	4,109.43	22%
1000 A	20,822.69	25,388.72	4,566.03	22%
1100 A	22,904.96	27,927.59	5,022.63	22%
1200 A	24,987.22	30,466.46	5,479.24	22%
1300 A	27,069.49	33,005.33	5,935.84	22%
1400 A	29,151.76	35,544.20	6,392.44	22%
1500 A	31,234.03	38,083.08	6,849.05	22%
1600 A	33,316.30	40,621.95	7,305.65	22%
1700 A	35,398.57	43,160.82	7,762.25	22%
1800 A	37,480.84	45,699.70	8,218.86	22%
1900 A	39,563.11	48,238.57	8,675.46	22%
2000 A	41,645.37	50,777.43	9,132.06	22%
2500 A	52,056.72	63,471.80	11,415.08	22%
3000 A	62,468.06	76,166.15	13,698.09	22%

**Table 10 – Three Phase 277/480 Voltage Recommended Impact Fees**

	<b>Current 277/480 Volt</b>	<b>Proposed 277/480 Volt</b>	<b>Dollar Adjustment</b>	<b>Percent Adjustment</b>
10 A	\$ 480.52	\$ 585.90	\$ 105.38	22%
20 A	961.05	1,171.76	210.71	22%
30 A	1,441.57	1,757.66	316.09	22%
40 A	1,922.09	2,343.52	421.43	22%
50 A	2,402.62	2,929.42	526.80	22%
60 A	2,883.14	3,515.28	632.14	22%
70 A	3,363.66	4,101.18	737.52	22%
80 A	3,844.19	4,687.04	842.85	22%
90 A	4,324.71	5,272.94	948.23	22%
100 A	4,805.24	5,858.80	1,053.56	22%
125 A	6,006.54	7,323.51	1,316.97	22%
150 A	7,207.85	8,788.22	1,580.37	22%
175 A	8,409.16	10,252.92	1,843.76	22%
200 A	9,610.47	11,717.59	2,107.12	22%
300 A	14,415.71	17,576.43	3,160.72	22%
400 A	19,220.94	23,435.23	4,214.29	22%
500 A	24,046.18	29,294.02	5,247.84	22%
600 A	28,831.41	35,152.82	6,321.41	22%
700 A	33,636.65	41,011.61	7,374.96	22%
800 A	38,441.88	46,870.45	8,428.57	22%
900 A	43,247.12	52,729.25	9,482.13	22%
1000 A	48,052.35	58,588.04	10,535.69	22%
1100 A	52,857.59	64,448.28	11,590.69	22%
1200 A	57,662.83	70,307.22	12,644.39	22%
1300 A	62,468.00	76,166.08	13,698.08	22%
1400 A	67,273.30	82,025.09	14,751.79	22%
1500 A	72,078.53	87,884.02	15,805.49	22%
1600 A	76,883.77	93,742.96	16,859.19	22%
1700 A	81,689.00	99,601.89	17,912.89	22%
1800 A	86,494.24	105,460.83	18,966.59	22%
1900 A	91,299.47	111,319.76	20,020.29	22%
2000 A	96,104.71	117,178.70	21,073.99	22%
2500 A	120,130.89	146,473.38	26,342.49	22%
3000 A	144,157.06	175,768.04	31,610.98	22%