

March 9, 2018  
via email: mhaddad@ci.redding.ca.us

Mr. Mark Haddad  
Redding Electric Utility  
Assistant Director-Financial and Business Services/CFO  
3611 Avtech Pkwy  
Redding, CA 96002

**Subject: Rate Study Update Letter Report**

Dear Mark:

Redding Electric Utility (REU) is a department within the City of Redding, California (the City) which provides electricity to its citizens. REU operates the utility with oversight by the Redding City Council (City Council). The City Council retains authority for approval of the bi-annual budget, rates for electric service, and other aspects of REU services.

In March 2017, the City retained NewGen Strategies and Solutions, LLC (NewGen) to develop an update to a previous cost of service (COS) and rate study, as well as to provide financial modeling services. This report summarizes the analyses conducted with respect to the updated COS and rate design efforts conducted by NewGen on behalf of REU (the Rate Study or Study). The updated financial model was provided to REU on November 13, 2017 as a final product.

The Rate Study determined the total cost of providing electric services, the allocation of costs to the various customer classes, and the design of selected rates for the Large Commercial customer class, as more fully described herein. Additionally, this Study included the development of a Rate Impact Analysis tool specifically designed for REU Large Commercial customers. The total cost of providing services predominately includes operations and maintenance (O&M) expenses, debt service, and cash capital outlays required to operate and maintain the system with high reliability. This report (Report) describes the process, analyses, and recommendations related to the Study.

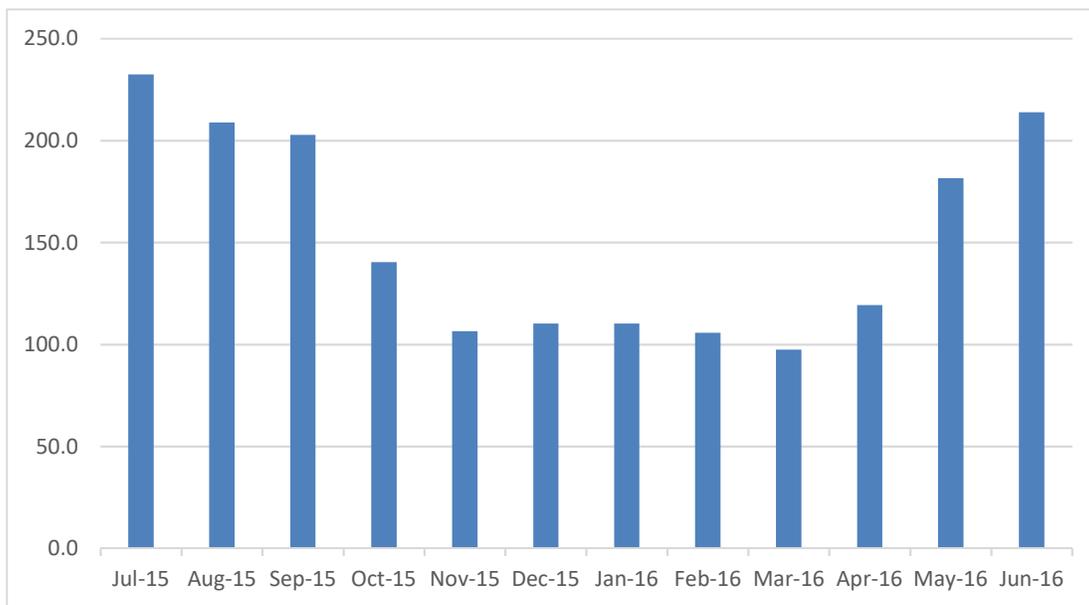
REU and the City's fiscal year (FY) is from July 1<sup>st</sup> to June 30<sup>th</sup>. Unless otherwise stated in this Report, all data presented herein is shown in FY. The Study included an analysis of estimated revenue requirements, an unbundled COS analysis based on an adjusted FY ending June 30, 2016, a rate analysis, and the development of proposed new electric rates for the industrial customer class. The Test Year (TY) for this Study was defined as the average for FY ending 2018, 2019, 2020 and 2021. Adjustments to the revenue requirement included a comparison of the audited FY 2016 compared to the TY. REU staff provided the majority of the system-specific data utilized for the Study. In certain cases, where information was not available, NewGen developed estimates based on our experience and publicly available information. Analyses were performed in accordance with generally accepted industry practices for municipal electric utilities.

## Electric Utility Description

In 2016, REU served approximately 44,000 retail electric customers, including approximately 36,000 residential and 8,000 commercial customers. The electric utility sold approximately 782,000,000 kilowatt-hours (kWh) of electricity during 2016.

The transmission system consists of assets owned and utilized by REU for procuring wholesale power and delivering power to the REU distribution system. For the purposes of this Study, it is assumed that the high-voltage circuit that rings the City is considered part of the REU distribution system and that the transmission assets utilized for procuring wholesale power are part of the transmission system. The distribution system consists of approximately 1,570 miles of overhead and underground distribution lines. There are 11 substations, two switch yards, and approximately 7,800 transformers on the REU system.

REU obtains its power from a combination of its own power plants (total capacity of 186 MW), its active participation in the California wholesale power market, as well as specific power purchase agreements, including a Western Area Power Administration (WAPA) hydro purchase power contract. During 2016, the system coincident peak was approximately 232 megawatts (MW), which occurred in July 2015, as shown in Figure 1. REU's annual load factor is approximately 36%.



**Figure 1. Monthly Coincident Peak Demand for FY 2016**

The system peak is also referred to as the Coincident Peak (CP), as it represents the hour at which the combined customer's load was coincident with each other. The CP is a useful tool for determining cost causation in a COS study. The contribution from each customer class at the time of the peak represents their respective allocated portion of the costs incurred by the utility to meet that peak demand. For this Study, we utilized a four (4) CP methodology to allocate production demand costs to each customer class. The 4 CP methodology represents the contributions to each peak month during the predominant four peaks of the system (as represented above by the June, July, August and September peak months).

## Projected Energy Requirements

REU's projected TY electric consumption used in the Study is shown in Table 1. Total consumption reflects projected sales to REU retail customers during the TY, as provided by Itron, plus system losses of approximately 4.5%. Study energy production and sales to customers were based on discussions with REU staff and reflected adjustments to load.

**Table 1**  
**Estimated Energy Requirements (MWh)**

TY	Total Retail Sales	System Losses	Total Net Energy for Load (kWh)
Test Year Average – Adjusted	735,985	33,119	769,104

## Usage Characteristics by Class – TY

The COS analysis examines detailed customer usage characteristics by customer class. Table 2 summarizes these characteristics for the customer classes served by REU, including projected retail sales (MWh), number of customers in each class, and estimated contribution to peak demand (based on the 4 CP methodology utilized for this Study). Projections were provided by Itron, which has been contracted by REU to provide load forecasts for the system.

**Table 2**  
**TY Summary of Electric Utility Characteristics by Customer Class <sup>(1)</sup>**

Class/Service	Retail MWh Sales	No. of Customers	Contribution Peak Demand <sup>(2)</sup>
Residential Service	350,982	37,355	508,533
Small Commercial	106,516	6,281	99,999
Large Commercial	273,434	568	249,485
Fixed Usage	255	544	0.1
Lighting <sup>(3)</sup>	4,798	8,401	-
<b>Total</b>	<b>735,985</b>	<b>53,148</b>	<b>N/A</b>

(1) Based on monthly projections provided by Itron.

(2) Contribution to Peak Demand based on 4 CP methodology (4 Summer Months at system peak).

(3) Lighting includes City Owned and Customer Owned street lights, which are typically not on during the summer peak.

## Cost of Service and Rate Design Process Overview

Typically, the COS and rate design process includes five steps as follows:

1. *Determination of the Revenue Requirement* – This first step examines the utilities financial needs and determines the amount of revenue that must be generated from rates. For municipal utilities, the revenue requirement is determined on a “cash basis.” A “cash basis” analyses examines the cash obligations of the utility such as operation and maintenance expenses, debt service, cash funded

capital projects, transfers and payments to the City. Rates are set such that the utility can pay its bills on an annual going-forward basis.

Utilities that directly serve retail customers, like REU, typically use a projected period to establish their revenue requirement. Historical years are adjusted based on current information regarding the utilities' cost structure. These adjustments create a "Test Year" for rate making. Adjustments may rely on a forward-looking financial forecast that may span a three- to five-year period.

In preparing our analysis of the electric rates and the development of the revenue requirement, NewGen relied upon REU's financial reports; projected biennial budgets for FY 2018 and 2019; a 2% assumed rate of cost inflation for FY 2020 and FY 2021; records of operation; customer billing data; and other detailed information and data compiled and provided by the REU management and staff.

The average across this four-year planning period was produced to represent the Test Year. The Test Year annual revenue requirement for the Study is \$124,645,199. A summary of the accounts for the Test Year is provided in Table 3.

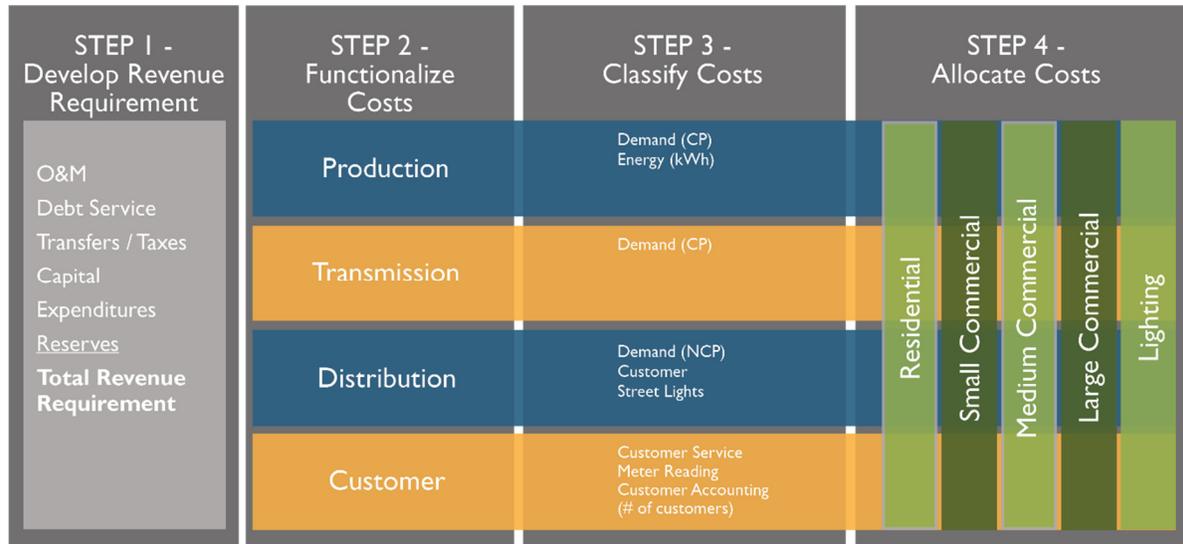
**Table 3**  
**REU System Revenue Requirement**

Line Item	Audited 2016	Adjustment	Test Year Value
Total Operations and Maintenance Expenses	\$124,918,504	(\$10,589,264)	\$114,329,240
Total Debt Service	\$14,936,240	(\$1,005,004)	\$13,931,236
Total Taxes Other than Income	\$5,731,029	706,868	\$6,437,897
Total Capital Paid from Current Earnings	\$9,332,169	(\$1,175,169)	\$8,157,000
Total Less Other Income <sup>(1)</sup>	(\$28,501,326)	\$10,291,152	(\$18,210,174)
<b>Total</b>	<b>\$126,416,616</b>	<b>(\$1,771,417)</b>	<b>\$124,645,199</b>

(1) Includes other revenues and adjustments.

2. *Functionalization and Sub-functionalization of Costs* – The revenue requirement is then assigned to the particular function or sub-function of the utility. Fully integrated utilities like REU typically have production, transmission, distribution, and customer services functions. Sub-functions may include different sources of power supply (generation infrastructure, purchased power, etc.) and transmission infrastructure at different voltage levels. Distribution sub-functions may include distribution infrastructure by voltage, metering, billing, collection, etc.
3. *Classification of Costs* – Once costs are functionalized, costs are then classified based on the underlying nature of the costs. Of particular importance is the determination of fixed versus variable costs. Fixed costs remain a financial obligation of the utility regardless of the amount of energy produced whereas variable costs fluctuate based on system energy requirements. Further, fixed and variable costs are associated with utility requirements to meet customer demand, energy, and customer service needs.
4. *Allocation of Costs* – Once costs are classified, costs are allocated to the various customer classes. Allocation factors align with cost classification; demand-related costs are allocated on measures of class demand such as class contribution to the system peak. Energy allocation factors are based on energy consumed by customers. Customer allocation factors are based on the number of customers.

These first four steps in the COS process are depicted in the representational figure below (note, this may or may not reflect specific elements of the REU system).



**Figure 2. Cost of Service Process**

The final, and fifth step is rate design, which translates COS results into rates for each customer class.

### Cost of Service Results

The results of the COS analysis provide a detailed assessment of the costs required to serve each of the customer classes. These customer class costs are unbundled into utility functions, and classified into demand, energy, and customer components. Customer class costs are compared to the projected revenues under current rates to determine if current rates are sufficient to meet costs. Once completed, the COS analysis is the basis for rate design.

A comparison of the revenue requirement by class is shown in Table 4.

**Table 4  
 COS Results by Class <sup>(1)</sup>**

Class/Service	Revenue Requirement
Residential Service	\$68,969,032
Small Commercial	\$17,697,999
Large Commercial	\$37,942,512
Fixed Usage	\$21,828
Lighting <sup>(2)</sup>	\$13,828
<b>Total</b>	<b>\$124,645,199</b>

(1) Allocated share of TY Revenue Requirement by customer class / group.

(2) Lighting includes City Owned and Customer Owned street lights.

The COS analysis resulted in a determination of a cost-based “Bundled” service charge. The Customer Charge recovers costs associated with serving the customer, including metering, customer service and other costs. The Demand Rate is designed to recover fixed costs for the production and delivery of power for customer classes with demand meters, which for REU includes the Large Commercial customer class. For customer classes not incurring a demand charge, the fixed costs are recovered by the Energy Rate. A summary of the bundled cost of service charges is included in Table 5.

**Table 5  
Bundled Cost of Service**

Class/Service	Residential Service	Small Commercial	Large Commercial	Fixed Usage	Lighting <sup>(1)</sup>
Customer Charge (\$/Cust-Mo)	\$16.61	\$25.10	\$141.18	\$0.91	\$0.72
Demand Rate (\$/kW)	N/A	N/A	\$26.04	N/A	N/A
Energy Rate (\$/kWh) <sup>(2)</sup>	\$0.1753	\$0.1484	\$0.0622	\$0.0622	\$0.1049

(1) Lighting includes City Owned and Customer Owned street lights.

(2) Fixed costs are recovered in the Energy Rate for Residential, Small Commercial, Fixed Usage and Lighting customer classes.

### **Rate Impact Model – Large Commercial Customers**

Based on feedback from City Council, it was decided that only limited changes to REU’s existing rates were warranted at the time of this Study. It was determined that the existing Large Commercial rate was difficult to administer, a challenge for customers to understand, and was not rewarding the efficient use of energy. REU requested the development of a specific Rate Impact Model designed to analyze rate impacts for all Large Commercial customers served by REU. The Rate Impact Model required significant review of specific customer accounts to verify accurate billing determinant data, as well as multiple iterations to resolve and accurately define billing impacts.

A final Rate Impact Model was provided to REU on October 20, 2017. The Rate Impact Model includes the proposed changes to the Large Commercial rate, as well as incorporating the movement of certain customers who historically had been misidentified in the REU billing system (these customers were either moved from Large Commercial to Small Commercial, or vice-versa). Additionally, the Rate Impact Model allowed REU management and staff to analyze the results of the new Large Commercial rate by specific customer premise number, existing rate code and percentage increase / decrease. Further, the analysis included an assessment of the Large Commercial class impacts. In general, those Large Customers with low load factors received an increase in their monthly bills, whereas those with high load factors received a decrease in their monthly bills. This is consistent with the general policy of the utility to design rates that encourage efficient use of the system.

Mr. Mark Haddad

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We appreciate the opportunity to be of service to you and Redding Electric Utility. If you have any questions regarding this Report or the COS and Rate Impact Analysis conducted for this Study, please contact me directly at 720.259.1762 or [sburnham@newgenstrategies.net](mailto:sburnham@newgenstrategies.net).

Sincerely,

**NewGen Strategies and Solutions, LLC**

A handwritten signature in blue ink, appearing to read 'Scott Burnham', with a long horizontal line extending to the right.

Scott Burnham  
Executive Consultant