Agenda Report

August 1, 2011

TO: Honorable Mayor and City Council

THROUGH: Municipal Services Committee (July 26, 2011)

FROM: Water and Power Department

SUBJECT: AMENDMENT TO THE LIGHT AND POWER RATE ORDINANCE, CHAPTER 13.04.071 OF THE PASADENA MUNICIPAL CODE

RECOMMENDATION:

It is recommended that the City Council:

1. Find that the proposed amendment to the Light and Power Rate Ordinance is statutorily exempt from the California Environmental Quality Act ("CEQA") pursuant to State CEQA Guidelines Section 15273 (Rates, Tolls, Fares, and Charges); and

2. Direct the City Attorney to return within 60 days with an amendment to the Light and Power Rate Ordinance, Chapter 13.04.071 of the Pasadena Municipal Code, to extend the authority of the General Manager of the Water and Power Department to implement experimental electric rates for all customers. The experimental rates will either sunset after a maximum three-year period or be recommended as permanent rates, will be available to all customer groups and will be limited to no more than three percent (3%) of retail energy sales as measured in megawatt hours (MWh.)

EXECUTIVE SUMMARY:

Electric customers generally use more power on weekday afternoons, particularly on hot days. These times of high usage are commonly referred to as "on-peak" periods. As a consequence of high on-peak energy use, utilities must add generation and distribution infrastructure, transformers and lines are stressed and more likely to fail, less efficient and higher polluting generation is called into service, and energy procurement costs are much higher than during nighttime "off-peak" hours. Therefore, encouraging customers to shift their electric usage from on-peak to off-peak hours would provide many benefits. The current electric rates offered by Pasadena Water and Power (PWP) do not provide sufficient economic signals to its customers to encourage a shift to off-peak usage, which may be less convenient in some instances.

Furthermore, the up-front meter costs paid by the customer to choose time-of-use (TOU) rates are a significant barrier to selecting TOU rate alternatives.

PWP is proposing to amend the Light and Power Rate Ordinance to extend the existing authority of the General Manager to implement experimental retail electric rates for all customers. The primary purpose of the experimental rate program is to reduce on-peak electricity usage (especially for Electric Vehicle (EV) charging) and to shift new electricity usage to off-peak periods when costs are lower. The program would also allow PWP to recover TOU meter costs over time with a reasonable monthly meter fee. The current experimental rate authority granted to the General Manager extends only to rates impacting medium and large commercial and industrial customers and is limited to one year.

All pilot rate programs will be limited in scope and open to all customers on a first-come, first-served basis. Participation in the programs for which experimental rates are developed will be completely voluntary. Any customer can choose to remain at the rates specified in the Ordinance and forego potential benefits of the experimental rates. The impact of all combined experimental rates will be limited to a maximum of three percent (3%) of total energy sales in megawatt hours (MWh) within each customer group. Experimental rates will be designed to be revenue-neutral and will not result in discounted rates for one rate payer group that could result in higher rates for any other group. This will also prevent any adverse impact on net income to the Power fund. Each experimental rate design will sunset after a period of up to three years, unless adopted by City Council as a permanent rate.

BACKGROUND:

Section 13.04.071 of the Light and Power Rate Ordinance authorizes the General Manager of PWP to enter into special agreements with selected commercial and industrial customers to encourage experimentation in load management and conservation programs and to allow evaluation of the effect of electrical load management on the power system. PWP recently exercised this provision to provide temporary experimental electric rates for unmetered telecommunications devices and other equipment to better understand the electric usage and revenue impacts before obtaining City Council's approval to adopt a permanent rate for this type of service. While this rate provision has been useful for medium and large commercial and industrial customers, it does not provide the same authority for residential and small commercial customers. Furthermore, the provision has a maximum duration of twelve months for these temporary rate agreements. Below is a summary of the proposed changes to the current experimental electric rate provisions.

	Current	**Proposed**
Duration:	Up to 1 Year	Up to 3 Years
Participation:	Commercial Customers	All Customers
Scope:	Not Specified	Limited to 3% of Energy Sales within each customer group
Terms:	Limited Rates	Flexible Time-Of-Use (TOU) Periods/Rates

As new electric devices and equipment are introduced to the market, there is the need to expand the experimental rate authority to include all customer groups and extend the duration for up to three years. This will provide PWP with the necessary flexibility to roll out experimental pilot rates and services since these new electric devices and equipment may add strain to the power distribution system.

Today, many utilities are faced with developing rates for electric and plug-in hybrid vehicles, advanced metering, and "smart grid" related programs, just to list a few. However, there is limited or no empirical data available to determine the impact of different rate structures on the success of these programs. The use of experimental rates for pilot programs will help PWP to understand customers' electric usage behavior and evaluate their response to price signals or rate incentives necessary to reduce on-peak use.

The proposed experimental rates will focus on developing electrical load management programs (i.e., TOU rates, pilot smart grid projects, etc.) and evaluating the impact of those programs on customers' energy usage behavior. The impacts of these programs on rate revenues and the power distribution system will also be evaluated. Electrical load management is necessary for the utility to ensure that sufficient energy is produced and the distribution system is adequate for reliable delivery. Unmanaged loads can lead to outages from overburdened transformers and circuits and uneconomical procurement of energy when resources are not matched with loads.

Experimental Rate Design

The current TOU rates available to residential customers do not have adequate differential between on and off-peak rates to provide sufficient incentive to influence customer choices. PWP proposes to develop experimental rates to encourage customers to reduce on-peak energy consumption or shift usage from on-peak hours to off-peak hours when excess energy may already be available or the incremental cost to procure additional energy is at its lowest. Experimental rates would involve increasing the differential between on-peak and off-peak rates, that is, significantly reducing rates during off-peak hours and substantially increasing rates for on-peak usage. In addition, the on-peak and off-peak hours might be redefined to better fit the most opportune times for charging electric vehicles or conducting other high energy use activities.

Assuming that customers change their usage behavior, their bills would decrease – as would PWP's cost to procure energy. Ideally, these changes would match such that PWP's net income remains unaffected even as customers enjoy lower bills. Figure 1 shows an example of the impact of a possible TOU rate on the energy portion of a bill for a residential customer using 1,000 kilowatt hours per month.

Figure1: Energy Cost Component Under Different TOU Rate Options

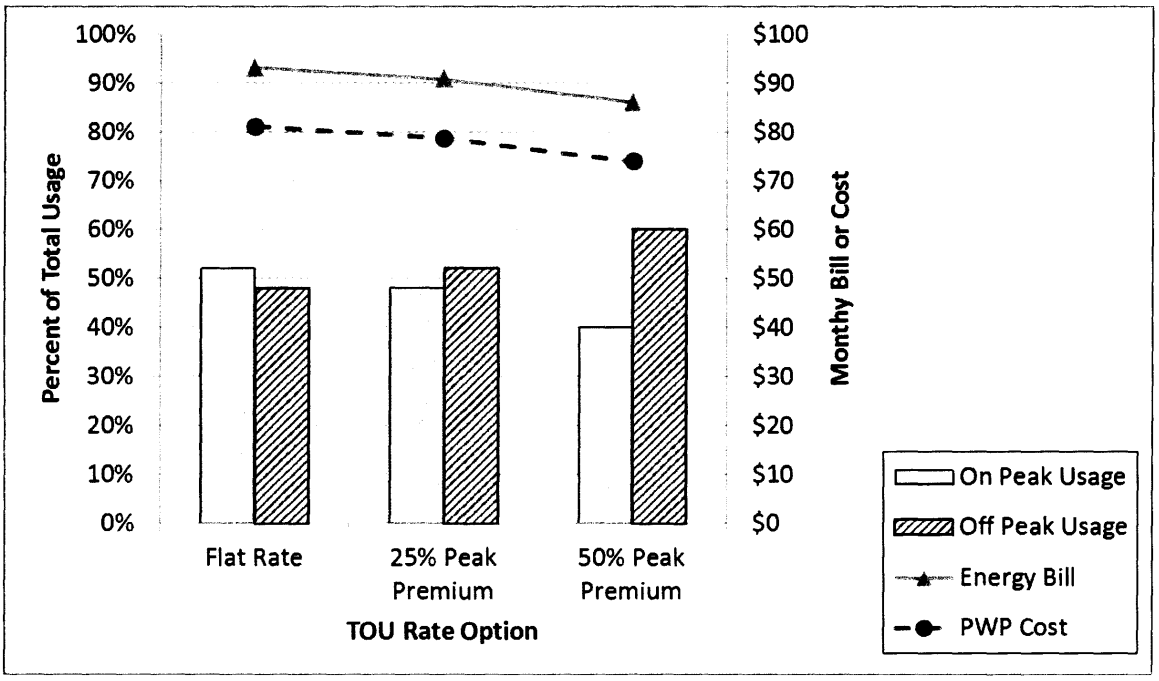

Figure 1 illustrates the following objectives and outcomes of TOU rate design:

- The three scenarios depict a flat rate for energy, a TOU rate where the on peak usage rate is 25% higher than the flat rate, and one were the on peak rate is 50% higher than the flat rate;
- Note that as the rate premium for on peak usage increases, the off peak price decreases to maintain revenue neutrality;
- As the difference between the on peak and off peak rate grows, customers respond by shifting more usage into the off-peak period (thatched grey bars grow larger);
- The shift to more off peak usage lowers overall energy bills (green line) and PWP's procurement costs (dashed red line) in tandem. If these were perfectly matched, PWP's operating margin (i.e., the difference between the energy bill revenue and PWP's cost) would remain constant.

Expanded authority for the General Manager to implement experimental rates will allow PWP to determine the optimal rate structure to ultimately develop a permanent rate that encourages customers to shift their energy usage to off peak periods.

At the end of the experimental period, PWP will use the results of pilot programs to develop permanent load management rates and rate structures that would be amended into the rate ordinance by approval of the City Council.

Program Participation Limits

The temporary experimental rates will be revenue-neutral and designed to enhance PWP's ability to manage its load and improve its operational efficiencies by encouraging power usage at times when power is less expensive or more readily available. Availability of the experimental rates will be limited to 3% of sales in MWh within each customer group to encourage participation by customers in each classification. This represents approximately 36,000 MWh per year or $3.0 million in annual revenue based on an average cost of about $0.086 per kWh. For reference, 36,000 MWh is 36 million kilowatt hours. Generation of energy is typically measured in MWh while consumption of retail energy is usually measured in kWh. A single participating customer shall not account for more than ten percent (10%) of available funding in its customer group. This will also ensure that the programs do not create a cross-subsidy between customer groups or allow a small number of large customers to take advantage of all the benefits of the program. Table 1 shows the sales impact of 3% for each customer group.

Table 1- Participation Limits for Experimental Rates

Customer Group	Approximate Annual Sales Limit (MWh)	Approximate Annual Revenue (million $)
Residential	10,500	$0.9
Small Commercial	4,500	$0.4
Medium Commercial	7,500	$0.6
Large Commercial	13,500	$1.1
TOTAL	36,000	$3.0

Meter Fees

TOU rates also require a different type of meter than is typically installed for most residential and small or medium commercial customers. As part of an experimental rate structure for electric vehicle customers, PWP may also develop a monthly meter charge to replace the current requirement that the customer pay for the TOU meter up front.

Experimental TOU Program Applications

Electric vehicle charging: One of the programs for which the expanded authority to establish experimental rates will apply is electric vehicle (EV) charging. Although the number of electric vehicles to be purchased by Pasadena residents is uncertain at this time, any significant number of vehicles could have a direct impact on the power distribution system and energy consumption. PWP will develop one or more

experimental TOU rate options to incentivize electric vehicle owners to recharge the vehicles during off-peak hours.

Smart Grid Pilots: PWP anticipates pursuing voluntary pilot projects to explore the use of advanced metering and communications with the customer. Alternative rate structures that vary the differential between on-peak and off-peak rates, alter the defined hours for on- and off-peak, or add additional rate periods (e.g., "super-peak", "mid-peak" or potentially even hourly) would maximize the benefit of these new technologies by combining better usage data with stronger economic incentives.

Demand Reduction/Load-Shifting Pilots: PWP may develop other new programs to encourage customers to shift their energy consumption to off-peak hours. Customers may be more inclined to adjust their air conditioning setting, or those with pools may be more inclined to change their pump timers to run off peak if the energy bill savings were greater. Thermal storage options to shift air conditioning load to night time hours could be more economically feasible under different rate structures as well.

COUNCIL POLICY CONSIDERATION

The recommended action is consistent with the General Plan Energy Element and the City Council's Strategic Planning Goals to increase conservation and sustainability. Developing electric rates to encourage load management use will reduce the need to procure additional energy and promote energy efficiency.

ENVIRONMENTAL ANALYSIS:

The proposed amendment to the Light and Power Rate Ordinance has been determined to be statutorily exempt from CEQA per Section 15273 (Rates, Tolls, Fares, and Charges). Under Section 15273, CEQA does not apply to the establishment, modification, structuring, restructuring, or approval of rates, tolls, fares, or other charges by public agencies which the public agency finds are for the purpose of:

1. Meeting operating expenses, including employee wage rates and fringe benefits,
2. Purchasing or leasing supplies, equipment, or materials,
3. Meeting financial reserve needs and requirements,
4. Obtaining funds for capital projects, necessary to maintain service within existing services areas, or
5. Obtaining funds necessary to maintain such intra-city transfers as are authorized by city charter.

The proposed amendment to the Light and Power Rate Ordinance is an administrative function that meets requirements 1-5 of the statutory exemption as listed above.

FISCAL IMPACT:

The fiscal impact of this action is intended to be minimal since the experimental rates will be designed to have little or no impact on net income to the Power fund. Both revenue and costs should be reduced by the same margin. If an experimental rate results in higher or lower net income to the Power fund, it may be terminated, adjusted, or replaced with a different rate to achieve the desired outcome. This action will not have any indirect or support cost requirements. The anticipated impact to other operational programs or capital projects as a result of this action, if any, will be minimal.

Respectfully submitted,

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