

March 14, 2017

Mayor and City Council:

The Water & Light Advisory Board (WLAB) received the Draft 2017 Renewable Energy Report on February 8, 2017 and adopted the following comments at the March 8, 2017 Water Light Advisory Board Meeting.

OVERALL COMMENTS

WLAB recommends that a methodology be developed which permits real total costs, (cash expended) of all renewable energy lumped together to be compared to real total costs (cash expended) of all nonrenewable energy lumped together directly. Splitting electricity sources into base load, intermittent resources and peaking resources contributes to the difficulty of doing so. In the not too distant future, Columbia will be obtaining a large portion of their energy from intermittent renewable sources and the historical thinking regarding classes of energy no longer meets CWL's needs. A major difference is that intermittent energy does not carry with it generating capacity in the same degree that fossil-fueled generators do. CWL has and in the future will have to maintain reliable capacity, as defined by the Midwest Independent System Operator (MISO). We have done so in the past, by the purchase of Columbia Energy Center and the Dynergy contract which starts next year. In the future, we will need to do more to assure that we have the capacity to provide reliable energy. The costs associated with capacity are part of the cost of intermittent energy from wind, solar and the MISO energy market. The real total costs, cash expended of all energy is what electricity rates must cover and needs to be accurately reported and understood.

NET METERING COMMENTS

The quantity of energy coming from customer net metering, customers installed photovoltaic (PV) systems is calculated by multiplying the kW installed by net metered customers by the Quaker Oats company's PV system, a part of the Solar One program, kWh / kW to provide the 754 MWhs quantity of net metered energy reported on page 3. This is reasonable, as CWL does not have a direct measurement of the total solar

energy produced.

The WLAB disagrees with the method of calculating the cost impact on electricity rates. The multiplier used, \$88.80 / MWH (\$0.0888 / kWh) is the average residential electricity rate. The utility does have direct costs associated with net metered customers but has ignored them. These direct costs are A) \$500 per kW rebate paid upon installation, B) The cost of purchasing electricity from the MISO energy market to return the net metered electricity to the customer after the PV system stops generating due to the sun setting. We also note that when the solar energy being generated enters CWL's distribution system it saves CWL the cost of purchasing energy. Since the cost of energy on the MISO market, which changes hourly, is higher during the day than when the utility returns the electricity to the customers, CWL experiences a modest savings.

The WLAB recognizes that CWL costs associated with the distribution system is currently a portion of the per kWh rates. The few individuals whose PV systems are producing their entire annual electricity needs, are not covering their share of this cost. Another group of customers, those with high peak demand, are also not covering their share of the distribution system costs. Some preliminary data suggest that high demand customers may be the greater of the two. There is probably significant overlap between the net metered customers and the high peak demand customers. CWL is gathering data to identify the extent of this problem in order to develop a solution. At present, large commercial customers are paying two rates, one based upon kWh used and another based upon peak kW demand. Consequently, they do cover their impact on the distribution system even after installing PV systems.

Another problem with the method used to calculate the cost impact on electricity rates is that the multiplier of \$80.88 is applied to the estimated total electricity generated by the net metered PV systems. Since much of this is used in the houses immediately, that portion never uses CWL's distribution system. Based upon the few houses for which the WLAB has data, that quantity is close to and typically over 50%. CWL measures the net metered electricity entering the distribution system and should use that

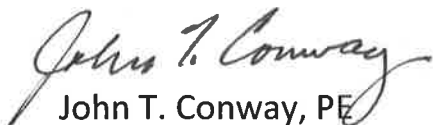
number rather than the estimated total kWh produced as the basis upon which to calculate the cost impact on electricity rates. The energy used immediately by the house does reduce CWL's revenue in much the same manner as finally persuading one's children to turn off the lights and shut the door or insulating one's attic reduces CWL's revenue. To assess costs for net-metered solar, the installed net metering system that is in place and available in the customers files, should be used to determine how many kilowatt-hours were received from customers. The Renewable Energy Report should not be allowed to assume an engineered estimation of total kilowatt hours.

COLUMBIA SOLAR PRODUCTION COMMENTS

This group includes the West Ash Solar Field and Solar One. Jim Windsor explained that Solar One is currently operating at a loss, because of a drop-off of subscribers. This is rather perplexing because some customers are still paying \$3.35 per month (\$40.20 in total) plus their regular rate tariff, for 100 KWH of solar energy from Solar One. This amounts to a total of \$0.50 / KWH or \$500/ MWH for the Solar One energy. It should be entirely adequate to pay the costs of the program.

Equally perplexing is that the utility is normally quite diligent in including all costs for Renewable Energy and, if Jim is right in Solar One costing more than it receives, why would that cost have been excluded?

Either way, we feel Solar One to be an important renewable energy program the expense and income from which should be included in the Renewable Energy Report. At the least, it should include the number of subscribers, the number of subscriptions, and the production numbers, including contracted \$/KWH amounts from the Solar One producers.

A handwritten signature in cursive script that reads "John T. Conway".

John T. Conway, PE

Chairman, Water and Light Advisory Board