RATIONALE for GHG REBATE 3-5-23 Dick Parker

The current electric rebate dollar amount is largely driven by the energy efficiency **impact upon peak demand.** During that summer afternoon peak demand period MISO price of energy, LMP (Local Market Price), is higher but a much larger portion of the cost to CWL is the cost of capacity with an increase in peak demand. CWL capacity requirement is based upon the annual peak hour of demand. A one kWh increase costs about $36.50 annually in 2022. Increased peak demand also increases the costs of the transmission and distribution system to deliver the additional energy which is less than half as much as the cost of energy.

In Columbia and Missouri GHG production is primarily from electricity, then transportation fuel and natural gas in that order.

The major use of natural gas in Columbia in residential and commercial buildings is for heating. The primary replacement for this is heat pumps. Heat pumps derive near half of their energy from the environment, either air or ground, thus reducing energy use. When using renewable energy produced electricity they will produce no GHG. CEC has proposed that our utility achieve that by 2030. Consequently much of the life of a heat pump installed now will only be using renewable energy.

When energy efficiency rebates were established the focus was on reducing peak demand. CWL currently provides a rebate for heat pumps based upon the energy efficiency impact it has on peak demand from air conditioning. A single table covering both Air Conditioner and Heat Pump rebates is based upon the SEER value (Seasonal Energy Efficiency Ratio for summer) and ranges from $50 to $350 for a one ton unit and values for larger units through 5 tons.

Any increase in peak demand requires an increase in capacity. CWL has a contract with Dynegy that started at $2.50 per kW month in 2018 ($30.00 annually) and goes up to $4.60 in 2027, its last year. In 2022 in the MISO market bidding for capacity went for $100 perk kWh. Electricity cost from MISO is higher in the summer afternoons but the price at our peak hour is typically less than $0.15 higher for the single peak kWh than adjacent hours. The big cost is for capacity caused by the increase in CWL's peak demand. In 2022 this would have been $1,200 additional for capacity not just $0.15. Heat pumps also produce heat in colder weather. The existing rebate does not consider the benefits derived from the large reduction in GHG used for heating. Those months have lower demand so increasing demand then has little impact on CWL expenses other than the purchase of the additional electricity. The cost of energy is about half of

CWL operating expenses. The rest covers the cost of transmission and distribution along with administration. Transmission and distribution costs are also based upon peak demand with CWL needing sufficient to deliver the peak demand load. Adding demand from heat pumps in cooler months does increase the cost but only enough to purchase the additional electricity being sold. This is only about half of the increased revenue. It does not increase costs for transmission and distribution or administration. Another way of saying this is the utility cost of serving heat pumps in most months is only half of the increase in revenue they generate. Flatter more even loads through out the year are appreciated by all electric utilities. The increased revenue will result in everyone's prices rising more slowly and help fund new construction.

Replacing lots of gas furnaces in Columbia with heat pumps will eventually result in shifting the peak demand from summer afternoons to winter mornings.

The commercial electric industry generates above 10% profit, and some times more than 20%. CWL does not make a "profit" but our electric prices are very close to commercial utility prices so it is not unreasonable to assume that we would generate roughly the same additional revenue above the cost of providing the electricity. This 10% is part of the 50% revenue not needed to cover the additional electric sales. This

currently helps fund CIP (Construction In Progress) expenses. Customers changing from NG heating to a heat pump would increase their electricity use primarily in Tier 2 rates. These are currently $0.1025 per kWh. Thus 10% or 50% would generate $0.01025 or $0.05125 per kWh additional overhead revenue with current rates.

Perhaps a rebate of 5 or 10 years of the additional overhead revenue and “profit” could be used to incentivize the transition to heat pumps. An average customer might result in near $47 annual increase in revenue above the cost of energy. If the 10 years of value is used the rebate would be $466.