



## Legislation Text

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File #: 20-1230, Version: 1

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### **PUBLIC UTILITIES ADVISORY BOARD AGENDA ITEM**

#### **ACTION REQUESTED:**

Recommend approval of the proposed changes to Article B - Service Rules and Policies, Section 18.5 to waive the fee for the transformer upgrade charge to support the installation of a permitted residential electrical vehicle charging station.

**DEPARTMENT:** Electric Utility

**SUBMITTED BY:** Lucy Podlesny, Director

#### **BOARD/COMMISSION REVIEW:**

N/A

#### **BACKGROUND:**

The number of electric vehicles (EV(s)) registered in Naperville continues to increase, and while incentives for Level 2 and 3 charger installations in Naperville residences was included in the March 2020 Renewable Energy Program changes, the Electric Utility (Utility) continues to look for ways to encourage the adoption of EVs and ensure their chargers are installed in a safe, code compliant manner. As of July 31, 2020, there were 265 Naperville permitted installations of EV chargers and about four times as many electric vehicles registered in Naperville zip codes according to the Illinois Secretary of State. This is especially concerning to the City as the installation of a single EV charger, in many instances, could double the load placed on the electrical infrastructure of the home. If this is not installed properly there is risk to the homeowner and the public.

When seeking a permit for the installation of a Level 2 or Level 3 EV charger it is often necessary, due to the additional electrical load, for a homeowner to pay all the infrastructure upgrade charges related to residential electrical service upgrades. This is consistent with section 18.5 of the Electric Utility Service Rules and Policies. This upgrade may consist of the electrical service wires to the home and the transformer that feeds those wire. The Utility uses a variety of standards to determine the required service wire and transformer size to support the requested electrical service upgrade. Originally, the complete cost was borne solely by the first homeowner's permit request, even though the transformer may be shared across many homes.

In recent years, the Utility has divided the cost of the transformer upgrade portion of the service upgrade across all customers connected to the transformer. The fractional transformer upgrade cost is typically about \$750 per homeowner. To date the utility has not had more than one homeowner request an upgrade per transformer, and thus has not recaptured any additional incremental costs, yet staff continues to track this data.

If charging of a EV is performed during non-peak hours (10PM-7AM) the number of transformers that

need to be upgraded would be significantly lower. Moving all charging to off peak hours will also improve the efficiency of the grid and improve load factor of the Utility, contributing to stability in one component of rates.

### **DISCUSSION:**

Utility staff propose amending the ordinance that requires homeowners to pay all the infrastructure upgrade charges related to residential electrical service upgrades. The amendment would eliminate the transformer upgrade portion of the service upgrade fee if an EV charging station installation is included in the permit application. The two major benefits for this change are: ensuring code compliant installation of charging equipment and improving the load factor of the Utility which contributes to the stability of rates. Residential homeowners would still be required to pay for the service wire upgrade and installation.

Because transformers that serve residential load are typically lightly loaded during non-peak hours, the Utility is able to forgo the transformer upgrade with a customer's agreement to charge their EV during non-peak hours. The movement to non-peak hours also reduces the possibility of contributing to the peak demand. Finally, the Utility's demand contributes to the IMEA peak demand, and by lowering this demand, less capacity must be procured by the agency, again contributing to stable energy prices.

If non-peak charging is not instituted there is a strong possibility that more transformers will have to be upgraded, and with larger transformers come additional infrastructure costs, such as the upgrade of the wires to the transformers. These larger transformers also increase system losses during lightly loaded periods.

An additional condition of the waiver of transformer upgrade fees will be that the Utility will have the ability to review and utilize aggregate load data for EV charging installations. The Utility will analyze transformer load data, EV charging on the Utility's system peak, as well as verify that charging is being completed during non-peak periods.

The charging of vehicles during non-peak hours will be further studied by the Utility and its rate consultant to determine if additional rate components are required to ensure compliance. Time of use rates will also be evaluated during the rate study that is expected to be completed by Q3 2021. The utility will propose rate and cost of service adjustments to council in late 2021, to become effective on 1/1/2022.

### **FISCAL IMPACT:**

If still required, upgrading a transformer to accommodate the extra load of a charger during a planned and coordinated outage will cost an average of \$6000 during normal business hours and the existing transformer may, depending on age and condition, be reused. If unpermitted charging occurs during peak hours and the charger was installed without a permit (and the utility was unable to upgrade the size of their equipment) this could damage the transformer and cause an outage for all customers serviced by that transformer. The emergency transformer replacement could cost up to \$10,000. Additionally, damaged transformers are not able to be re-used and it is not cost effective to have them repaired.

The Utility absorbing the transformer upgrade fee in exchange for non-peak charging will potentially save the utility \$179.42 monthly per charger in avoided demand charges to IMEA, if the vehicle is charging during the peak demand hour within the month. With this savings, the return on investment for the transformer upgrade is less than 34 months.