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Poster Title: Assessing the Impact of Three-Part Rates on Residential Electric Customers

Abstract: The volumetric rate structure is the most predominant rate construct in the utility industry in the United States. Under the rapidly growing emergence of Behind-the-Meter (BTM) technologies such as rooftop solar, storage, etc., this rate structure is widely found to be incapable of supporting and sustaining the power and utility business model. This rate construct will lead to inaccurate compensation technologies, unfair cost shifts between electric customers, or will create complicated grid challenges such as the Duck-Curve (through false price signals). Three-part rates—rates with demand charges—have been identified as a promising option to overcome these challenges.

In this study we are evaluating the impact of three-part electric rates on (1) customer bills and (2) low-income customers. In addition, we evaluate the (3) competitiveness of various emerging technologies under three-part rates. To understand the impact of three-part rates, we designed multiple three-part rate constructs with varying level of energy, demand, and fixed charges based on the projected utility cost structure in 2030.

To further understand the implications of three-part rates, we are testing these rates against multiple criteria.

- First, we are studying the impact of these rates on ~1.5 million residential customer bills with smart electric meters to understand (1) how significant these bill impacts are, and (2) which customer groups will be most/least affected by these rates.
- Second, given the importance of impact on low-income customers for any rate proposal, we isolated the low-income customers from the rest of population to thoroughly evaluate the impact of three-part rates on this group.
- Third, we are going to select a representative sample of residential customers, identified based on energy use, monthly peak demand, and their daily energy use profile, to study the competitiveness of various technology scenarios under these proposed rates.

As the utility industry explores the entire set of rate design options, we expect studies like this to lay the foundation for future decisions. Based on our preliminary findings; we expect this study to be informative for utility companies around the country