Supplemental Project Notice

TIME-VARYING PRICING FOR RESIDENTIAL CUSTOMERS

Preference Simulation Model to Design Pricing Options and Estimate Customer Enrollment

PROJECT HIGHLIGHTS

- Understand customer preferences in the current landscape of innovative pricing designs and emerging end-use technologies
- Obtain sampling and analysis customized for each participating utility territory
- Obtain a simulation tool that estimates customer acceptance and enrollment in configurable pricing designs, with micro-segmentation based on demographics and other measurable customer attributes

Background, Objectives, and New Learnings

Over the past decade, electricity providers have been increasingly offering time-varying pricing structures to residential customers. The intent of such pricing designs is to reflect the actual time-dependent cost of electricity to align customer incentives with grid needs such as peak reduction, load shifting, and demand flexibility.

Rate structures such as Time-of-Use (TOU) have matured from pilot programs to widely available pricing options. Dynamic pricing structures featuring more granular time intervals, such as hourly real-time pricing (RTP), are attracting greater interest because of their potential to motivate customers to adjust energy usage in response to grid conditions. In theory, such dynamic pricing can advance grid efficiency, reliability, and decarbonization, while reducing customers' electricity bills.

However, electricity providers face critical decisions on how to optimally design time-varying pricing options to realize their full potential benefits. Moreover, providers need to better understand customer preferences for time-varying pricing designs to anticipate their acceptance and enrollment rates. The following trends further motivate these needs:

- Customer demand for tailored pricing options, requiring greater granularity and complexity of time-varying pricing designs
- Increasing electrification of building heating systems (e.g., heat pumps) and transportation (i.e., electric vehicles)
- Growing penetration of distributed energy resources (DERs) that can be leveraged to respond to pricing signals
- Advances in smart controls and automation to enable more precise energy management and greater demand flexibility

The objective of this project is to inform electricity providers in their design of time-varying pricing structures, employing discrete-choice surveys that elicit customer preferences among multiple design variables. It will also deliver a simulation tool to estimate customer enrollment for configurable pricing designs based on quantitative interpolation of survey results.

Benefits

Benefits and new learnings for participants include:

- Optimal design of time-varying pricing structures based on insights into customer preferences.
- A greater understanding of customer willingness to adjust energy usage for bill savings, and the influence of pairing electrification, DER, and smart control technologies.
- Improved planning from an accurate estimation of customer enrollment in configurable pricing designs. Facilitates fine-tuning of pricing designs for increased customer acceptance.

Public benefits from improved design of time-varying pricing structures include:

- Increased customer enrollment and persistence, thereby advancing load-shaping effects to enhance reliability and affordability of electric service.
- Decarbonization by enabling greater use of renewable generation through flexible demand.

Project Approach and Summary

EPRI will design and administer a survey of residential customers in each participating utility's service territory to elicit preferences for multiple pricing design structures and components. Key project elements include:

1. **Survey instrument to test pricing design concepts and household electricity use**, applying choice experiments to assess customer trade-offs among design features and bill components, such as: time-varying pricing (e.g., TOU, RTP, etc.) with multiple tiers and granularity levels; fixed charges; demand/capacity charges; high renewable generation tariffs; bill protection; and pairing with DER, electrification, and smart control technologies. EPRI can customize the pricing options for each participating utility's survey.
2. **Utility territory-specific sampling**. EPRI will recruit residential respondents from each participating utility, administering the survey, data collection, and analysis. Alternatively, EPRI can coordinate with utilities who prefer to self-administer the surveys.
3. **Simulation model to estimate probability of customer enrollment.** EPRI will program a simulation model based on survey result data to quantify customers' preferences for tested pricing design structures and components. This tool will allow utility users to estimate enrollment rates of configurable combinations of pricing design features.

Deliverables

Each utility participant will receive the following customized deliverables:

- Report that summarizes the survey methodology and customer insights for the utility's service territory, and pooled analysis of survey results across all participating utilities.
- Interactive simulation model (spreadsheet or alternative platform) to estimate customer enrollment levels of configured pricing designs.

Price of Project

The project price is $76,000 per member, with a minimum of four members required. Funding can be split over two calendar years. Additional participants increase the leverage of the shared core survey design, enabling larger sample sizes for greater statistical accuracy. The project qualifies for self-directed funding.

Project Status and Schedule

The project is available for participation beginning Q2 2024 and has a 12-month duration.

Who Should Join

Utilities seeking to: (a) inform the design of time-varying pricing options based on preferences of residential customers; (b) estimate enrollment rates for time-varying pricing options based on design features; and (c) assess the potential of flexible demand from pairing time-varying pricing with enabling technologies.

Contact Information

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