

Shaping the Future

## Getting to Know the Customer

### *EPRI Tests a 'Discrete Choice' Approach to Examine Utility Customer Preferences*

**By Phil Zahodiakin**

An EPRI study has demonstrated an approach for utilities to gauge their customers' interest in potential new electric services.

Traditionally, many U.S. residential utility customers paid flat rates for electricity. Now, distributed solar generation, energy storage, electric vehicles, smart thermostats, and energy management systems provide opportunities for utilities to consider offering more diverse service plans and rates.

Before utilities commit resources to new plans, they need to better understand customers' preferences. For example, would customers consider a time-of-use (TOU) plan or a fixed bill plan over a flat rate plan?

"It is important to engage with customers in thoughtful ways to find out what they want, because often new technologies and service options are brand new concepts for people," said Jen Robinson, a senior EPRI technical leader.

### Developing a 'Discrete Choice' Survey

To examine customer preferences, EPRI adapted the research method known as a discrete choice experiment. "Discrete choice experiments are useful for estimating potential interest in new offerings with which customers may not yet be familiar," said Robinson. "An interesting example is the food company Prego, which used a related research approach to predict that a third of Americans wanted chunky spaghetti sauce before chunky spaghetti sauce even existed as a product."

Discrete choice experiment surveys introduce customers to a technology, plan, or product and then ask them to choose among hypothetical offerings with different combinations of features. The survey data are then used to estimate a "choice model" that evaluates customer preferences for the offerings.

"The resulting choice model also allows you to drill down to see what combinations of product features are likely the biggest drivers of customer preference," said Robinson.

EPRI developed the experiment and fielded surveys with three utilities: Kansas City Power & Light (Missouri), Salt River Project (Phoenix), and Tennessee Valley Authority (TVA). (For TVA, the survey queried customers from 12 of the local distributors of TVA power.) The survey asked customers about their preferences for TOU, fixed bill, and flat rate plans, along with specific plan features such as TOU peak and off-peak prices, length of the peak period, TOU seasons, and fixed bill contract lengths.

The surveys also asked customers for demographic information, enabling the choice model to differentiate the relative effects of plan features and demographics.

"Careful consideration of the questions is needed to develop a choice model that provides the most useful insights," said Robinson.

Prior to conducting the survey, researchers carefully tested and measured customers' understanding of the concepts and questions.

## Different Regions, Similar Results

Researchers applied the choice model to each utility's service territory using demographic information from U.S. Census data, enabling the utilities to estimate potential market size for the new rate plans.

Although the surveys were completed by customers from different regions and served by different types of utilities, the model's application predicted similar results for each utility. For example, about a third of the utilities' residential customers prefer TOU pricing over a flat rate.

Using the same approach, EPRI is planning a second round of surveys on preferences for additional service plans, potentially including grid-interactive devices such as smart thermostats and water heaters that can be matched with various rate structures. Researchers are conducting a discrete choice experiment to evaluate customer preferences for rooftop photovoltaics and community solar programs. Another is in the works to examine preferences for electric vehicles.

## Key EPRI Technical Experts

Jen Robinson