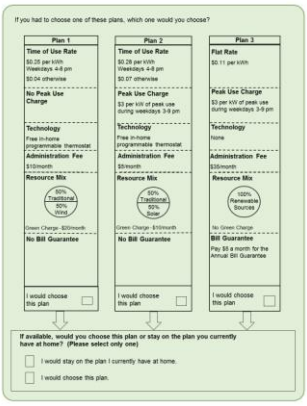
Veritas Economic Consulting, LLC
1851 Evans Road
Cary, NC 27513

Residential Demand Response

Despite the substantial potential for residential demand response through Time of Use (TOU) rates TOU offerings are limited. When utilities do offer TOU rates, uptake can range from almost zero to over 40 percent. Residential demand response is challenging because it requires enrolling many households to be effective. Veritas overcomes this challenge by combining advanced customer contact and survey research techniques with sophisticated econometric and simulation modeling to estimate load change potential by market segment, hour, census block, and appliance. We use this information to develop market strategies that induce adoption of time-based rates that are cost-effective and achieve utility objectives.



Example Discrete Choice Question

Advanced Survey Research

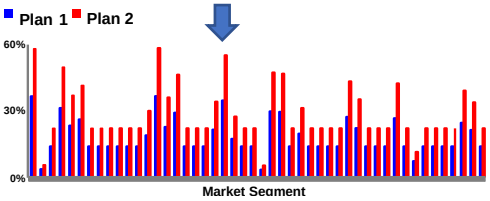
Although, utilities maintain robust customer lists and typically have good recognition and trust with their customers, these valuable resources are often underutilized. Veritas leverages utility-customer relationships in the context of the Dillman Total Design Method (TDM) to cost-effectively collect high-quality customer data. This results in response rates of over 50%, giving confidence in using results to support customer outreach, rate making, rate hearings, and resource planning.

Our most advanced surveys include Discrete Choice Experiments (DCE). We use data from DCE surveys to estimate econometric models of customer behavior. By combining the TDM and DCE techniques, it is possible to create scientifically based "what if?" models that allow evaluating outcomes under scenarios that include different electricity service plan offerings.

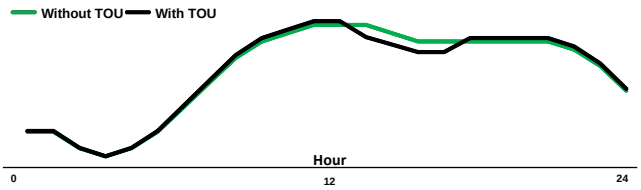
Sophisticated Simulation Modeling

EUSM User Interface

Behavioral functions from survey data populate a sophisticated but user-friendly model of electricity consumption. The Electricity Use Simulation Model (EUSM) is an appliance-level model of the changes in plans and load that accompany different electricity service plans. This model is used internally and is available for external users. EUSM supports conducting simulations from inputting rate plans, through customer adoption and behavior to census block level predictions of changes in peak load.



TOU Switch Probabilities by Market Segment and Plan

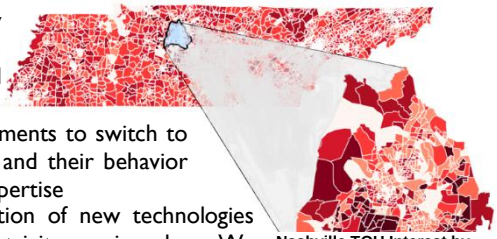


Peak Day Residential Load with and without TOU

Aggregating these over a region allows identifying implications for changes in system peak load and annual hourly load. Further calculations result in estimates of changes in customer bills. Linkages with Electricity Policy Simulation Model (EPSM) allow hourly calculations of system level annual changes in costs, revenues, and emissions.

Effective Uptake Encouragement

The potential of time-based rates is only realized with customer uptake. When conducting utility-specific survey research and modeling we learn a tremendous amount about the willingness of different market segments to switch to TOU plans, their motivations for switching, and their behavior once on TOU plans. Veritas has significant expertise in how these considerations underlie adoption of new technologies including electric cars, solar panels and electricity service plans. We combine this expertise with the understanding of customer contact and communication developed in survey research to develop plans for cost-effectively encouraging customers to switch to TOU rates.


Nashville TOU Interest by Block Group

These plans include information for region-wide appeals based on market average expectations and focused appeals to specific groups that are designed for maximum conversion in specific areas. In addition to encourage uptake, these plans can be used to support rate hearings and integrated resource planning.