

Assessment of APS's Bill Comparison Web Tool

METHODOLOGY AND FINDINGS

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THE **Brattle** GROUP



Purpose and Scope

Purpose

- APS commissioned The Brattle Group to assess the rate recommendations provided by its new bill comparison web tool

Scope

- Conduct bill analysis for representative sample of more than 46,000 residential customers who are eligible to use the APS web tool
- Independently assess the rate recommendations provided by the APS web tool to each customer in the sample

Approach overview

- Step 1: Establish a representative sample of customers
- Step 2: Obtain billing determinant data for sample
- Step 3: Independently develop bill calculator
- Step 4: Obtain APS web tool output for full sample of customers
- Step 5: Compare APS rate recommendations to Brattle calculations

Approach

Step 1: Establish a representative sample of customers

- APS randomly selected 55,343 service accounts from its residential customer base
- Of these, 46,757 were eligible for use of the APS web tool and therefore the subject of Brattle's analysis
 - Examples of reasons for ineligibility include being a customer with less than three months of billing history, distributed generation, or being a landlord
- The sample is significantly larger than the typical utility load research sample, which may consist of only a few thousand customers
- The sample aligns with the characteristics of the total population's monthly usage
 - Average customer monthly usage: 962 (sample) vs 996 (population)

Approach (cont'd)

Step 2: Obtain customer usage data for sample

- Customer usage data provided by APS for each customer in sample
- Data provided for period from November 2017 through December 2019; where customers had more than 12 months of data, most recent 12 months were used

Step 3: Independently develop bill calculator

- Monthly bills for each customer in sample and each applicable rate schedule were independently calculated by Brattle
- Calculations were subject to confirmation from APS regarding rate eligibility and treatment of specific charges/taxes

Approach (cont'd)

Step 4: Obtain APS web tool output for full sample of customers

- Provided by APS in .xls format
- Included monthly and annual bill calculations and rate recommendations for each customer in sample

Step 5: Compare APS rate recommendations to recommendations from the Brattle tool

Comparison performed for each of the 46,757 customers in the representative sample

Finding

Brattle's calculations of the customer's best rate for each customer match those of APS for 99.9% of customers in the sample

Presenter Information



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Ahmad Faruqi is internationally recognized for his work on the design, evaluation and benchmarking of tariffs. He has analyzed the efficacy of tariffs featuring fixed charges, demand charges, time-varying rates, inclining block structures, and guaranteed bills. He has also designed experiments to model the impact of these tariffs and organized focus groups to study customer acceptance. Besides tariffs, his areas of expertise include demand response, energy efficiency, distributed energy resources, advanced metering infrastructure, plug-in electric vehicles, energy storage, inter-fuel substitution, combined heat and power, microgrids, and demand forecasting. He has worked for nearly 150 clients on 5 continents, including electric and gas utilities, state and federal commissions, governments, independent system operators, trade associations, research institutes, and manufacturers.

Ahmad has testified or appeared before commissions in Alberta (Canada), Arizona, Arkansas, California, Colorado, Connecticut, Delaware, the District of Columbia, FERC, Illinois, Indiana, Kansas, Kentucky, Maryland, Minnesota, Nevada, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, Saudi Arabia, and Texas. He has presented to governments in Australia, Egypt, Ireland, the Philippines, Thailand, New Zealand and the United Kingdom and given seminars on all 6 continents. He has also given lectures at Carnegie Mellon University, Harvard, Northwestern, Stanford, University of California at Berkeley, and University of California at Davis and taught economics at San Jose State, the University of California at Davis, and the University of Karachi.

His research been cited in Business Week, The Economist, Forbes, National Geographic, The New York Times, San Francisco Chronicle, San Jose Mercury News, Wall Street Journal and USA Today. He has appeared on Fox Business News, National Public Radio and Voice of America. He is the author, co-author or editor of 4 books and more than 150 articles, papers and reports on energy matters. He has published in peer-reviewed journals such as Energy Economics, Energy Journal, Energy Efficiency, Energy Policy, Journal of Regulatory Economics and Utilities Policy and trade journals such as The Electricity Journal and the Public Utilities Fortnightly. He serves on the editorial board of The Electricity Journal. He holds BA and MA degrees from the University of Karachi, both with the highest honors, and an MA in agricultural economics and a PhD in economics from The University of California at Davis, where he was a research fellow.

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