

Rate Design for the Digital Age

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PRESENTED BY
Mariko Geronimo Aydin
Prepared with Ahmad Faruqui

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What Has Changed?

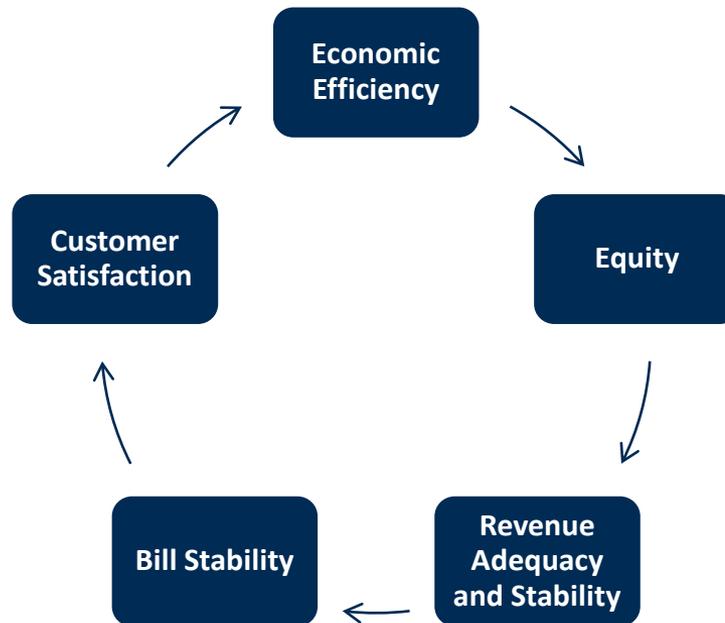
The “one size fits all” design of traditional retail rates ignores:

- Advanced meters, customer surveying techniques, and data analytics are making it easier to observe a diversity in customer preferences and behavior
- Green energy, smart home tech, smart appliances, EVs and storage are fundamentally changing what customers look for in electricity services
- Communication technology, webware, and apps are making it possible to engage customers on short notice and with complex shopping decisions

As a consequence, traditional rates leave some customers increasingly dissatisfied, incentivize them to shop and bypass the utility for services, and contribute to unfair and unsustainable cost allocation

Professor Bonbright of Columbia U.

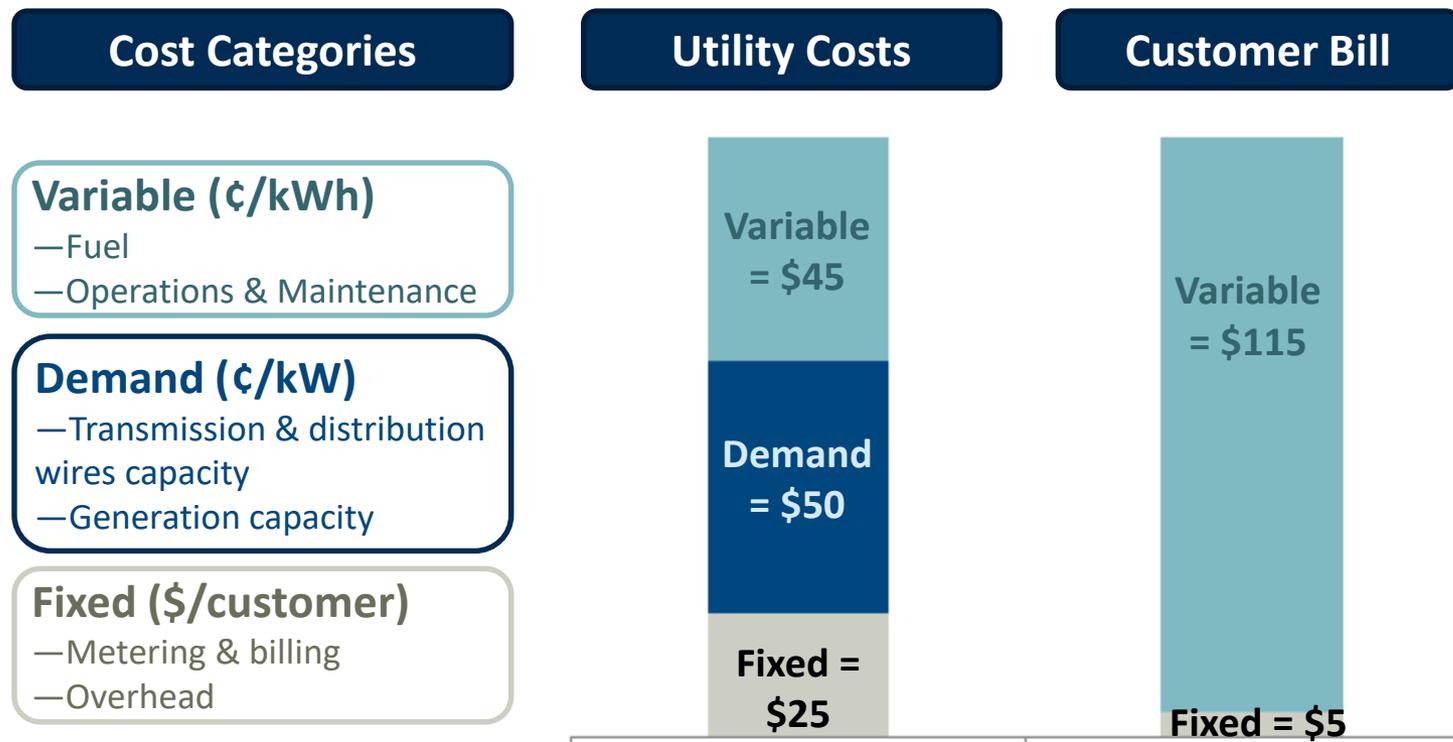
Modern tools and technologies can also *address* the problem, by achieving Bonbright's core principles at a deeper level



Graphic based upon Bonbright, James C., Albert L. Danielsen, and David R. Kamerschen, "Principles of Public Utility Rates," Arlington, Va: Public Utility Reports, 1988.

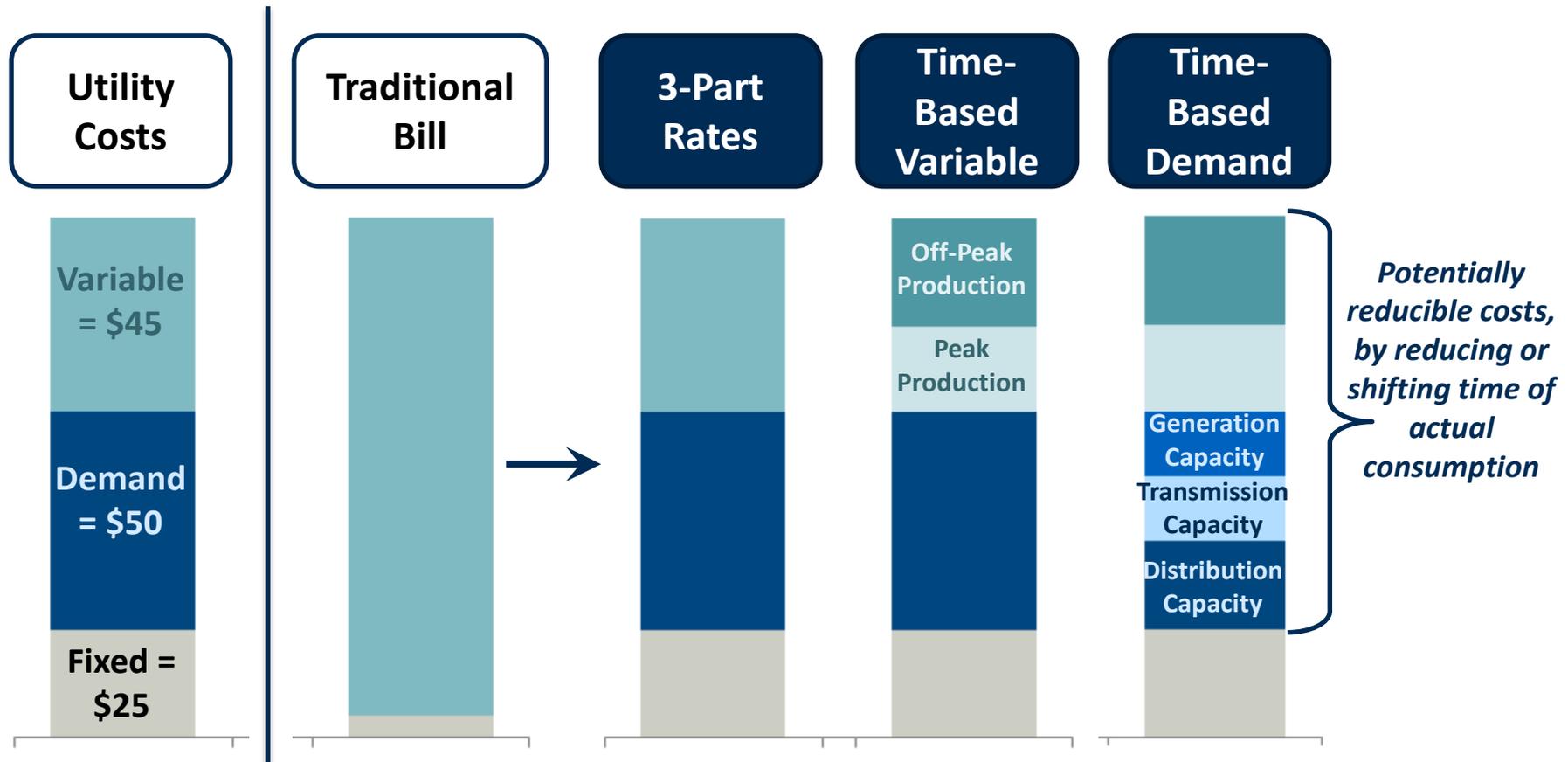
Economic Efficiency: Cost-Reflective Rates

Shopping and/or flexible customers need to see the cost implications of their choices and behavior, but, for many utilities, residential rates and costs are grossly misaligned



Example of Increasingly Cost-Reflective Rates

Customer pricing should reflect (a) what cost categories they have control over, and (b) how their usage patterns impact those costs



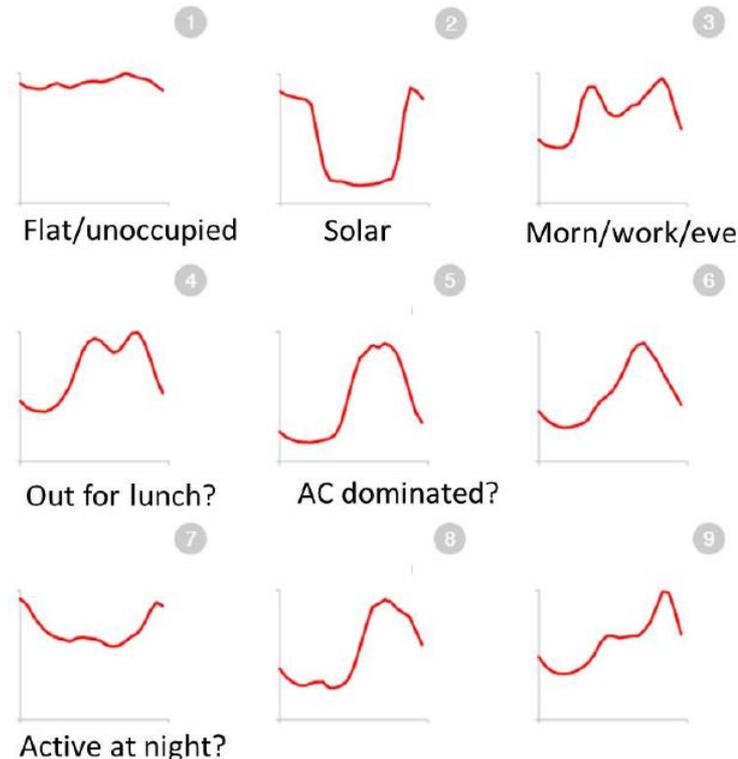
Equity: Customer Segmentation

- Rate classes define customer groups within which:
 - Rate structure reflects common energy usage patterns
 - Some cost-sharing is viewed as appropriate
- Traditionally residential, small commercial, large commercial
- New rate classes are emerging:
 - Distributed generation among residential customers
 - Electric cars and storage
 - Others?
- But within each class, rates must still be cost-reflective

Equity: More Meaningful Customer Segmentation with Smart Meter Data

Rate design and rate options can be better tailored as usage data is becoming more granular and more abundant

LBNL Analysis of Smart Meter Data: Representative Customer Load Shapes



Source: Cappers, Peter and Annika Todd, "Taking Advantage of Smart Meter Data: Combining Behavioral Economics with Data Science Analytics, Lawrence Berkeley National Laboratory, April 24, 2018.

Revenue Adequacy and Stability

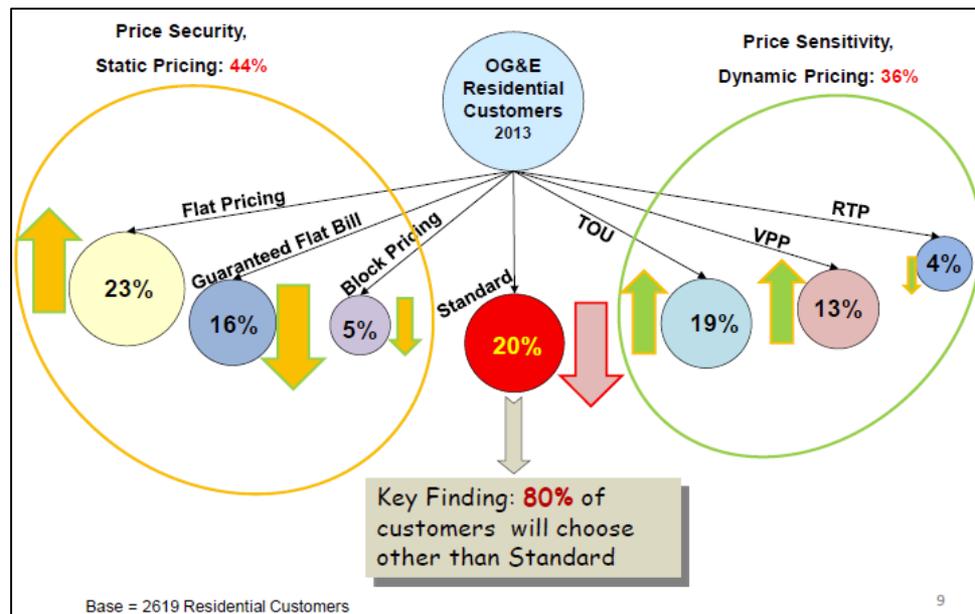
Cost-reflective rates ensure that customers who shop away take their share of costs with them

Decoupling ensures that the utility is not unfairly vulnerable to forecasting error in kWh sales

Choice of Bill Stability vs. Dynamic Pricing

Some customers are either not able to respond to dynamic pricing signals or are not interested. Modern tools can both identify nuances in customer preferences and enable utilities to offer tailored choices.

Customer Choices Among Pricing Plans (2013)
Residential Customers



Source: Direct Testimony of Bryan J. Scott on behalf of Oklahoma Gas and Electric Company, Before the Arkansas Public Service Commission, Docket No. 16-052-U, August 26, 2016. Survey responses include both Oklahoma and Arkansas customers. Arrows next to the residential customer results represent changes from an earlier survey conducted in 2010.

Customer Satisfaction

Customer centricity and customer interaction is becoming increasingly important for electricity services

Service providers must use modern tools and methods to:

- Understand customer needs and preferences via market analysis
- Offer meaningful choices and options
- Engage customers so they understand their choices and how to get the best out of their selected plan
- Observe actual customer choices and behavior, and learning from it

Energy supply and services that are determined “top down” are not nimble or tailored enough to meet customer needs

PRESENTED BY

Mariko Geronimo Aydin

Senior Associate, San Francisco

+1.415.217.1015

Mariko.Geronimo@Brattle.com



Ms. Mariko Geronimo Aydin, a Senior Associate in The Brattle Group’s San Francisco office, has almost fifteen years of experience in analyzing the policies and economics of electricity system planning, regulation and de-regulation of electricity supply, and wholesale electricity markets across the U.S. Her more recent work has focused on finding sustainable and creative ways to adapt traditional planning processes and analytical tools to an industry rapidly shifting towards cleaner and more scalable supply technologies. Today’s electricity industry still has untapped potential to meet goals of clean energy, cost-effectiveness, and operational and planning flexibility through greater electricity customer engagement, cutting-edge data analysis, and new technologies. To reach this potential with a robust and modern grid, Mariko works with clients to explore options for evolving utility business models, customer choice, and wholesale market refinements that can make the best use of distributed and customer-driven power supply resources, in synergy with more traditional resources.

Mariko holds a B.S. in Economics and an M.A. in Applied Economics from Northeastern University in Boston, Massachusetts.

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