

Customer Centricity

THE LYNCHPIN OF STRATEGY

Ahmad Faruqui, Ph.D.
925.408.0149

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THE **Brattle** GROUP

To Prosper, Utilities Will Have to Embrace Change and Get Ahead of Change

1. What is driving change?

The changing mindset of customers and the emergence of new technologies

2. What paths can utilities take?

Regulated utilities can travel a range of paths to either expand or restrict their activities

3. How can utilities grow their regulated business?

Re-invention grounded in a customer-driven and tech-forward business will be a key enabler of growth opportunities

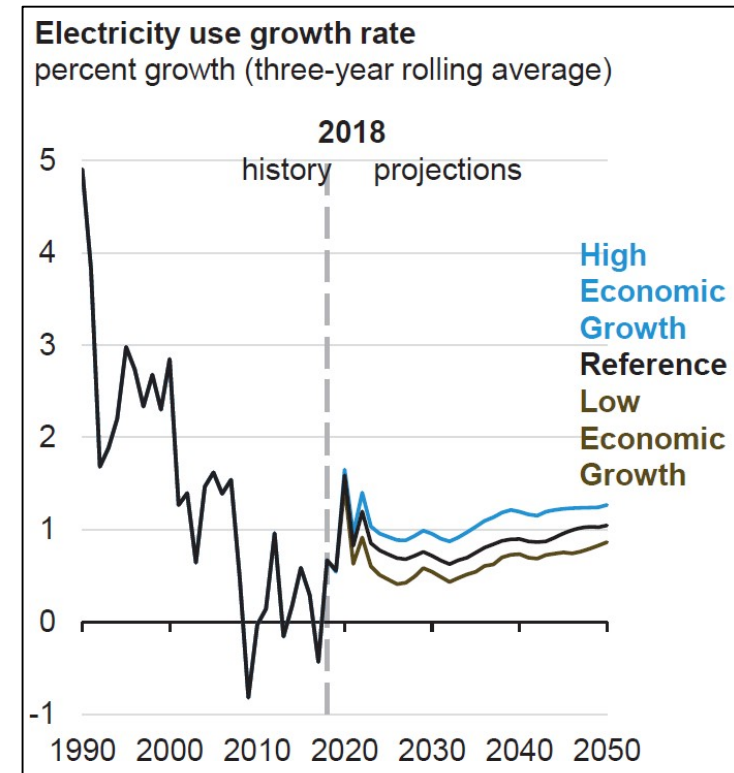
What is driving change?

Consumers are Snapping Up Smart Devices and Load is not Growing Anywhere Near Historical Rates

- Flat load growth is the new normal
- Individual customer use and behavior is now observable
- Customer preferences are growing in diversity and complexity
- Energy services tech and alternatives to utility service is dramatically more accessible at the customer's end
- Customers are shopping and engaging in complicated decisions with two-way data transfer
- Energy supply and services that are determined “top down” are not nimble or tailored enough to meet customer needs

Flat Load Growth is the New Normal

- Lighting, insulation, and electronics are getting more efficient
 - “Demand growth has been slowing since 1950, from nearly 10% a year during the ‘50s to less than 1% today” (Faruqui & Shultz, 2012)
- Electric vehicles or electric heating could help, but roll-out has been slow
 - Full electrification of the entire light-duty vehicle fleet via all new vehicle sales as EVs would add only about 1%/year load growth over 15 years*
- The traditional model of business growth through load growth has rendered obsolete



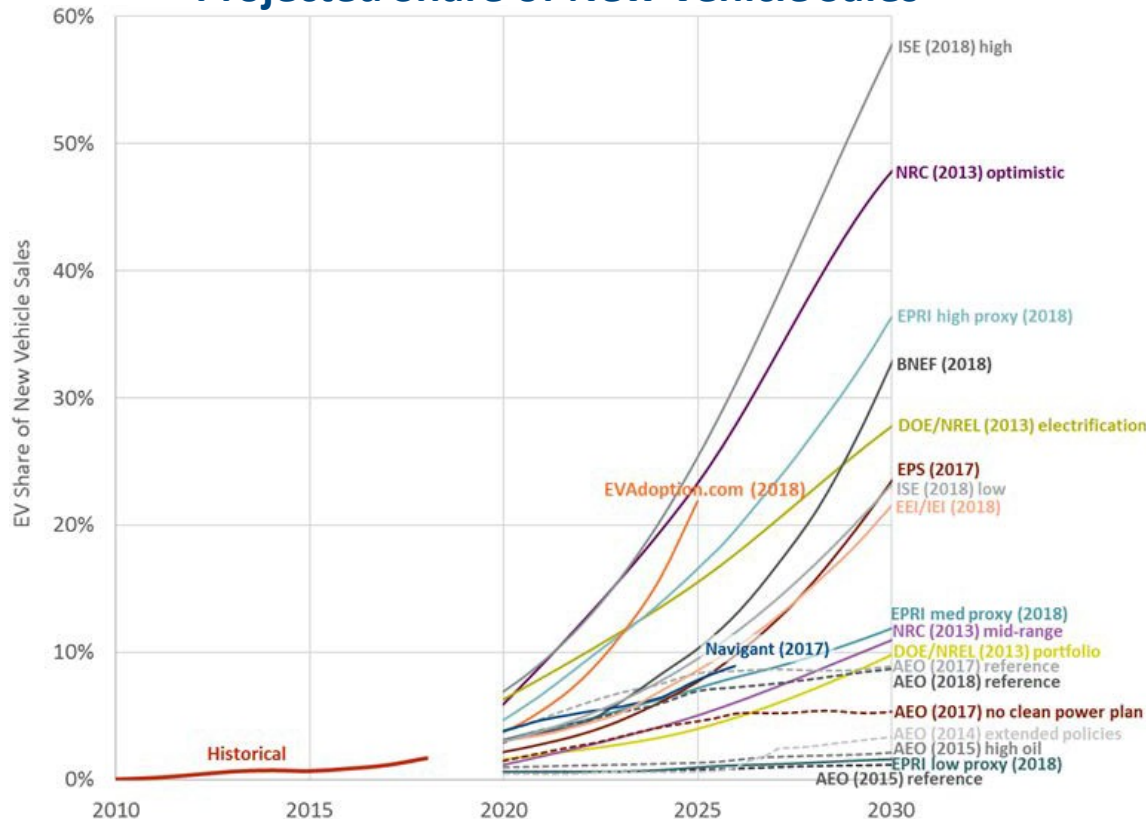
Source: [Annual Energy Outlook 2019, U.S Energy Information Administration](#)

*Assumes national averages, including 3,800 TWh baseline electricity consumption, 250MM total vehicles, 3 MWh per vehicle per year, and 15-year fleet turnover.

Flat Load Growth is the New Normal

EV Adoption Rates are Low

Projected Share of New Vehicle Sales



- EV adoption will likely remain low for a decade or more
- Full electrification of the entire light-duty vehicle fleet would add 20% to today's electricity demand
- Adoption via all new vehicle sales as EVs would add only about 1%/year load growth over 15 years*
- Even the most aggressive projections would achieve full electrification and that +20% electricity demand over several decades

Source: (Brattle compilation of listed forecasts)

*Assumes national averages, including 3,800 TWh baseline electricity consumption, 250MM total vehicles, 3 MWh per vehicle per year, and 15-year fleet turnover.

Customer Preferences are Growing in Diversity and Complexity

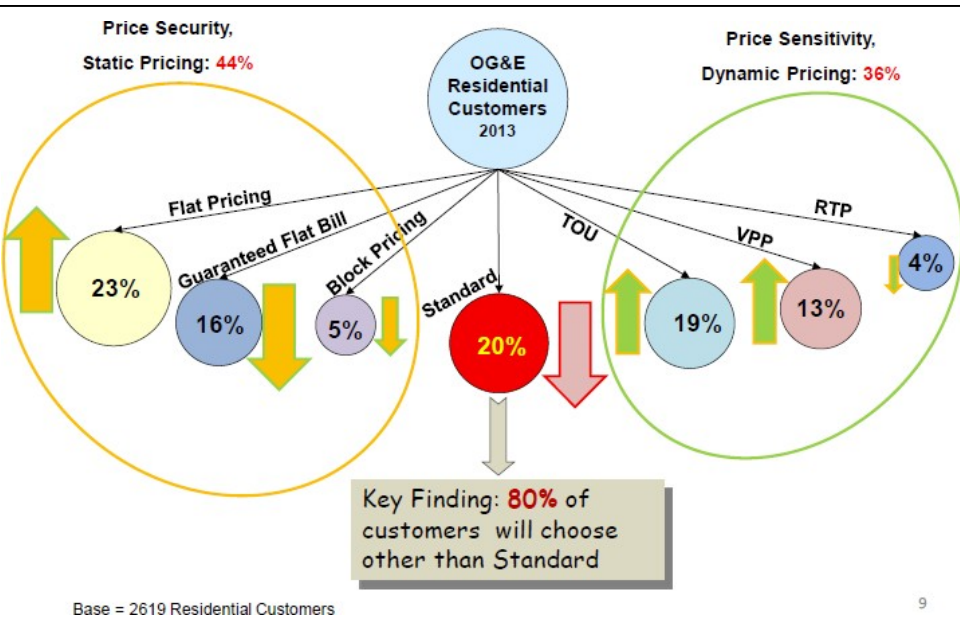
- **Customers “only want what they want” and will only respond to options meaningful to them**
- **Diversity in customer preferences is becoming apparent**
 - Bill stability vs. cost saving opportunity; degree tech savvy
- **Customers of all types are increasingly viewing energy as a heterogeneous product**
 - 67% of US adults think the federal government is doing too little to reduce the effects of global climate change (Pew, 2018)
 - Corporations “going green”, demanding more renewable energy
 - Communities are driving change:
 - “Price, Green, Local Control” are the key drivers of community aggregation
 - 120 cities have committed to some form of 100% clean energy (Sierra Club, 2019)
 - Individuals: self-supply, smart homes, greenness factor

Customer Preferences are Growing in Diversity and Complexity

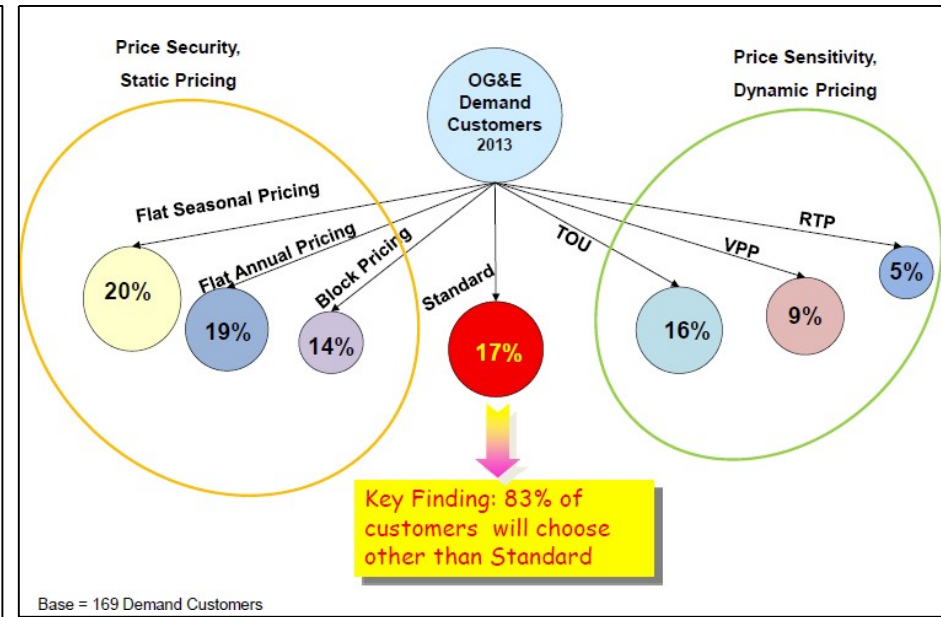
Bill Stability vs. Cost Saving Opportunities

Oklahoma Gas and Electric's conjoint analysis found diversity in customer preferences among pricing plans (2013)

Residential Customers



Demand Customers



Source: [Direct Testimony of Bryan J. Scott on behalf of Oklahoma Gas and Electric Company \(December 8, 2015\)](#). Survey responses include both Oklahoma and Arkansas customers. Arrows next to the residential customer results represent changes from an earlier survey conducted in 2010.

What Makes Customers Shop?

Customers are rational buyers and will pursue any “**uneconomic bypass**” of utility costs

Customers find opportunities through outdated regulatory approach and rate design

Customers may have specific preferences for **renewables** and for investing in **local resources**

Customers look elsewhere if the utility cannot provide tailored options

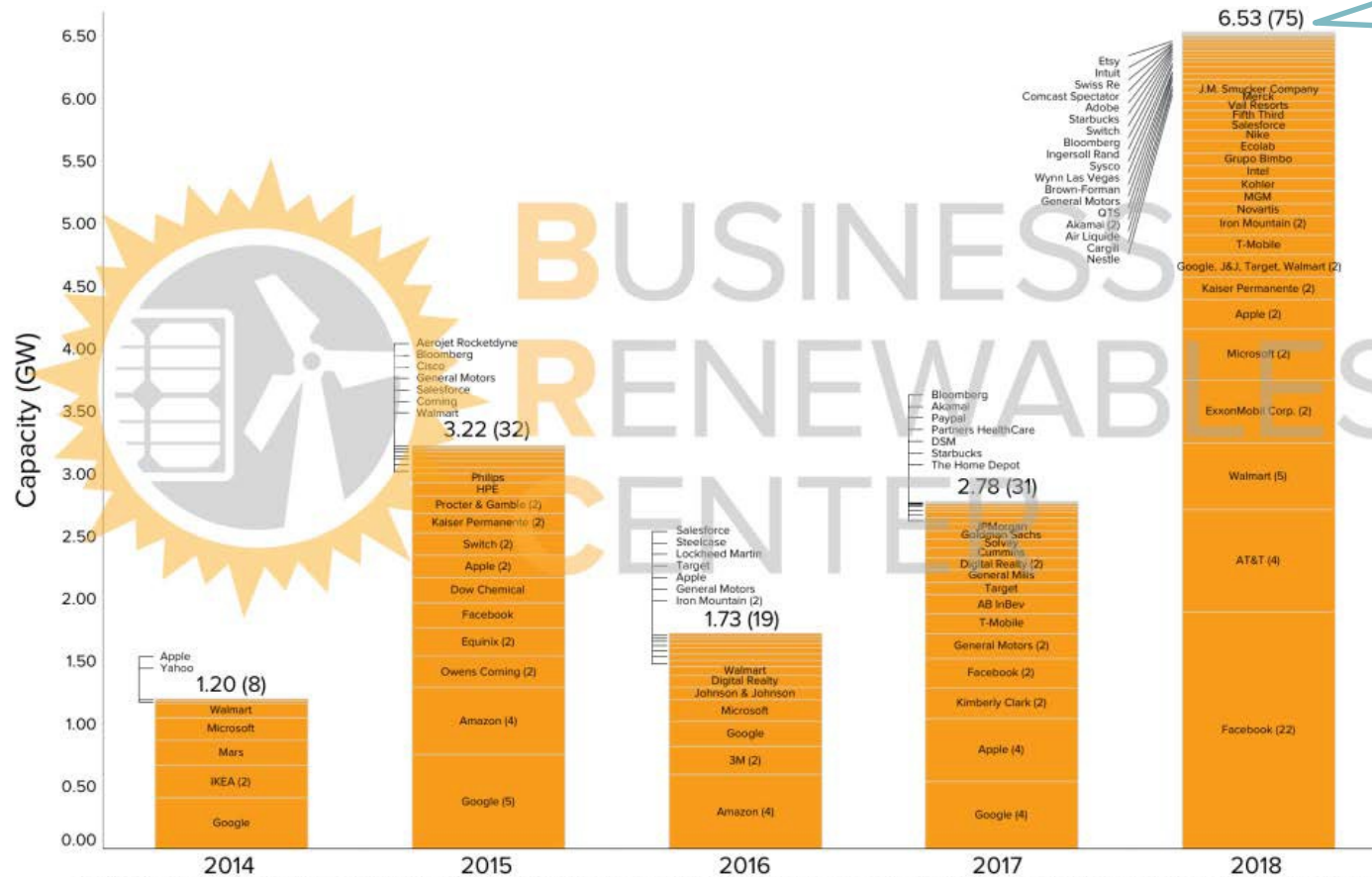
And communities want **local control**

Poor overall customer satisfaction and **utility public image** can be major drivers of customer departures

Corporate Customers are Shopping

2018 Was a Landmark Year for Corporate Renewable Deals

6.5 GW signed in 2018



As of December 31, 2018. Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US, 2014 – 2018. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. (#) indicates number of deals each year by individual companies.

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What paths can utilities take?

At a Strategic Level, Utilities Need to Analyze Three Pathways to the Future

- **Simple Wires Utility (SWU)** owns and manages the wires, “passes on” information and costs via bills, and leaves supply and all other meaningful customer engagement to 3rd parties
- **Smart Integrator Utility (SIU)** also gets out of regulated procurement, but more actively partners with 3rd parties and system operators to integrate technology and resources at the distribution level
- **Energy Services Utility (ESU)** is a “one stop shop” of full energy services, including customer-driven power supply options

Simple Wires Utility (SWU)

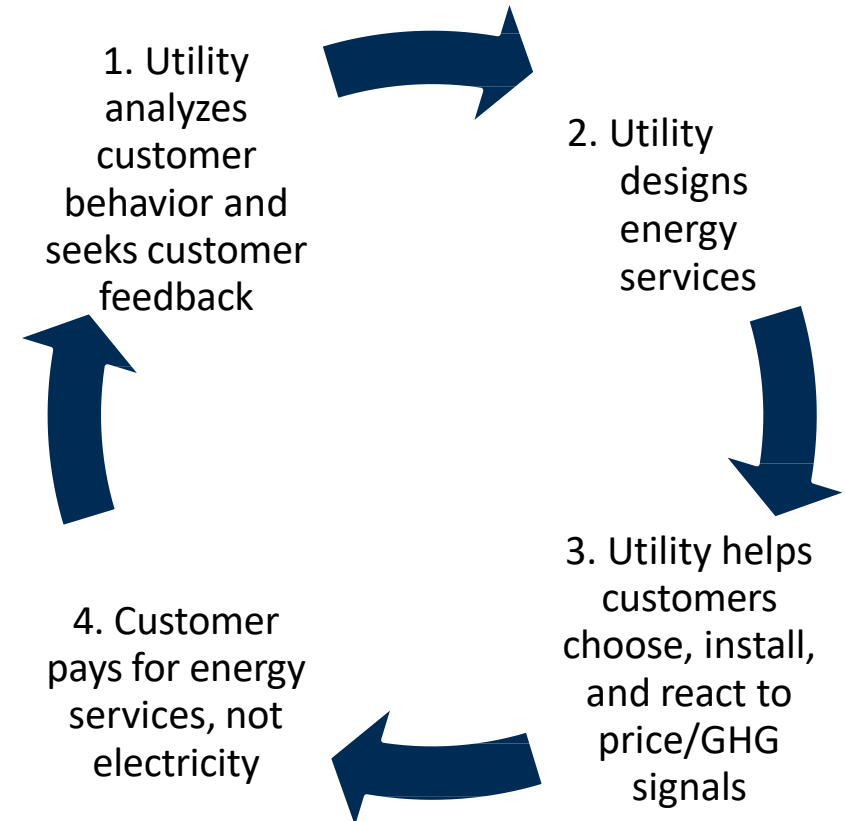
- The SWU owns and manages the wires, “passes on” information and costs via bills, and leaves supply and all other meaningful customer engagement to 3rd parties
- This could lead to a passive end state that consequently stifles grid investments and pushes DER development far into the customer’s realm
 - E.g., “price to device”-type innovations borne out of inaccessibility of granular customer and system data (to both customers and 3rd parties)
- Grid becomes increasingly difficult to operate and deliver power reliably (operator has low visibility on major changes on the customer end)

The Smart Integrator Utility (SIU)

- The SIU invests in and enables the high functionality of the smart grid but stops short of providing power supply and related services
 - Provides the right platforms for customers and 3rd party suppliers and service providers to interact
 - Creates and improves automation, granular two-way communications and data transfers, 2-way power flows, transactive energy markets, systems integration, and integration of broad range of supply resources

The Energy Services Utility (ESU)

- The Energy Services Utility is a one-stop-shop for meeting customers' energy-related needs
- Smart Integrator + sustainable power supply functions
- Requires the utility to become customer-centric and re-work traditional practices



ESU's have Growth Opportunities

Renewable procurement, for example, allows the ESU to grow in a way SWU and SIU can't

- ESU: builds or contracts based on what customers want, then adds to rate base & has a rate design that allocates costs fairly. Customers are happy and don't shop.
- Simple or smart wires status quo: pass through cost of renewables
- Simple wires → ESU: de-regulated utility convinces regulator to allow ~5% adder to mandated renewables contract
- VIU in death spiral: utility builds or contracts based on what regulator wants, adds to rate base. Corporate customers pursue additional renewable contracts outside of this framework. Communities dissatisfied and they depart via CCAs. Residential customers dissatisfied and they self-install rooftop solar. Rate design unfair and not reflecting customer preferences, leading to even greater dissatisfaction.
- Unregulated: Can get stable revenue or profit stream—if awarded utility contract, and depending on contract terms. On a pure merchant basis subject to depressed/no REC value and/or low/negative energy prices (depending on how utilities and other merchants are investing). Net metering and tax credits (PTC/ITC) essential for business model but not sustainable long-term.

Perpetuating the Status Quo Contributes to the "Death Spiral" when Customer Needs Shift

Railroads exemplify an industry that once thrived, but was decimated by new technology

- Railroads were once a vibrant industry
- Demand for transportation didn't decline, but faster means of transportation appeared and the demand for rail services plummeted
- But railroads continued to focus on rail services instead of expanding into other transportation services
- See Theodore Levitt's "Marketing Myopia" (1960)
- Today, energy utilities face a similar scenario

How can utilities grow their
regulated business?

Re-Invention for Growth Opportunities

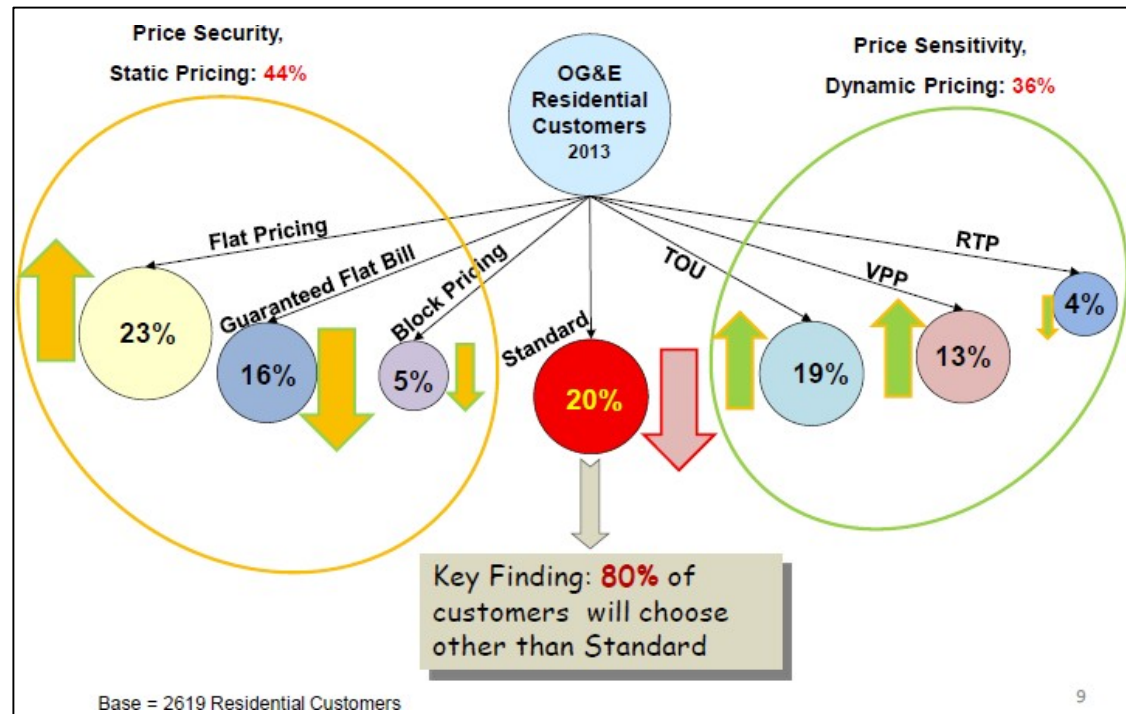
Re-invention grounded in a customer-driven and tech-forward business will be a key enabler of growth opportunities

- **Creates loyal and satisfied customers** who won't be as eager to shop
- **Speaks the language of tech companies**, and collaborates with them to get the best out of innovative partnerships
- **Collaboratively builds a supportive regulatory framework**
 - This is driven by a demonstration to the regulators and stakeholders that ESU is “ahead of the problem,” understands customer needs best, can foster innovation, and can help navigate pilots and full-scale deployments to the benefit of all customers

How Do Customers View Bill Savings vs. Bill Stability?

- Only 20% of OG&E's residential customers preferred the standard retail tariff structure
- 44% wanted more bill stability
- 36% wanted more dynamic pricing and cost-saving opportunities

OG&E Conjoint Analysis of Residential Customers (2013)



Source: [Direct Testimony of Bryan J. Scott on behalf of Oklahoma Gas and Electric Company \(December 8, 2015\)](#). Survey responses include both Oklahoma and Arkansas customers. Arrows next to the residential customer results represent changes from an earlier survey conducted in 2010.

How Do Customers React to a *Multitude* of Energy Services Options?

- Other industries have become incredibly sophisticated at customer analysis via conjoint analysis
- Many ways to do conjoint analysis, but one method relevant to the energy industry is a 2-step **menu-based stated preference conjoint analysis**:
 1. A customer survey

The survey includes about 20 questions, each presenting the customer with a menu of options, and it is designed to mimic the customer's purchasing decision-making process. Each question's menu of options reflects the dimensions of customer preferences to analyze (e.g., price, greenness, local investment). Tech-based survey administration is easy to use and draws a large customer sample.
 2. A statistical analysis of survey results

This is a discrete choice statistical model tuned to extract customer decision-making points.
- This type of analysis is particularly good at extracting how customers will *actually behave*

What you do versus what you say you like are different things.

—Todd Yellin, Netflix VP of Product

Observing Actual Customer Behavior

To design tailored and effective products and services actual customer behavior must be frequently observed, using all data, tools, and scientific methods available

- Well-designed pilot studies and experiments still valuable
- Smart meter data is a wealth of information on customer characteristics and usage behavior
 - Extracted via behavior analytics (LBNL, 2018)
- Frequent customer outreach and engagement to improve their experience and to solicit feedback

Choosing the Optimal Strategy

A Decade After the Great Recession ended, Sales Growth Remains Anemic

- The capital-intensive industry has to modernize its assets to ensure reliability, which is hard to do without growth in revenues
 - Additional pressure is coming from the need to change the resource mix to reduce and eventually eliminate carbon emissions
- The utilities continue to have an obligation to serve
 - But that's becoming increasingly difficult to do as new entrants have entered the picture, seeking to disintermediate the utility from its customers, vitiating its natural monopoly status
- How does a utility survive disruption?
 - Every CEO is seeking to create the utility of the future by getting ahead of change but most utilities have focused on cost cutting and changing the mix of generating plants

But the Disruption is Originating with the Customer and the Strategy has to be Customer Centric

- It's the customer who is engaging in organic conservation and using less electricity regardless of the price of electricity and regardless of whether or not there are utility programs, codes and standards to promote energy efficiency
- It's the customer whose voice is being echoed in legislatures; elected officials and regulators are reflecting the customer's voice when they pass laws and regulations requiring utilities to become carbon free in the decades to come
- The customer has attracted the attention of new entrants such as Amazon, Facebook, and Google; the customer prefers Big Box stores that are committed to procuring renewable energy
- Thus, Customer-Centricity has to be the lynchpin of utility strategy

Choosing the Optimal Strategy Will Require a New Way of Thinking about the Future

- Utilities will have to identify the multiple stakeholders in the regulatory process and in the marketplace and assess their intentions and capabilities
- Utilities will need to predict the behavior of customers, regulators and new entrants under different utility policies
- In picking their optimal strategy, utilities will have to anticipate how stakeholders might respond to utility decisions
- This is beyond the reach of Scenario Analysis – it's linear and ignores path dependencies
- A better approach is System Dynamics Analysis; some utilities have begun using it to screen alternative strategies and finding the one that is optimal for them

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PRESENTED BY

Ahmad Faruqui, Ph.D.

Principal, San Francisco

+1.925.408.0149

Ahmad.Faruqui@brattle.com



Ahmad's consulting practice is focused on the efficient use of energy. His areas of expertise include electrification, rate design, demand response, energy efficiency, distributed energy resources, advanced metering infrastructure, 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, independent system operators, government agencies, trade associations, research institutes, and manufacturing companies. Ahmad has testified or appeared before commissions in Alberta (Canada), Arizona, Arkansas, California, Colorado, Connecticut, Delaware, the District of Columbia, FERC, Illinois, Indiana, Kansas, Maryland, Minnesota, Nevada, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, ECRA (Saudi Arabia), and Texas. He has presented to governments in Australia, Egypt, Ireland, the Philippines, Thailand and the United Kingdom and given seminars on all 6 continents.

His research has 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*. Ahmad 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 is on the editorial board of *The Electricity Journal*.

He holds B.A. and M.A. degrees from the University of Karachi, an M.A. in agricultural economics and Ph.D. in economics from the University of California at Davis.

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