

Tariffs of the Future for Gas Utilities

PRESENTED TO:

Center for Research in Regulated Industries (CRRI)
31st Annual Western Conference

PRESENTED BY:

Léa Grausz, M.S.

CO-AUTHORS:

Ahmad Faruqui, Ph.D.
Henna Trewn, B.A.
Cecile Bourbonnais, B.A.

June 28, 2018

THE **Brattle** GROUP

A variety of disruptive technologies have begun to appear in customers' premises

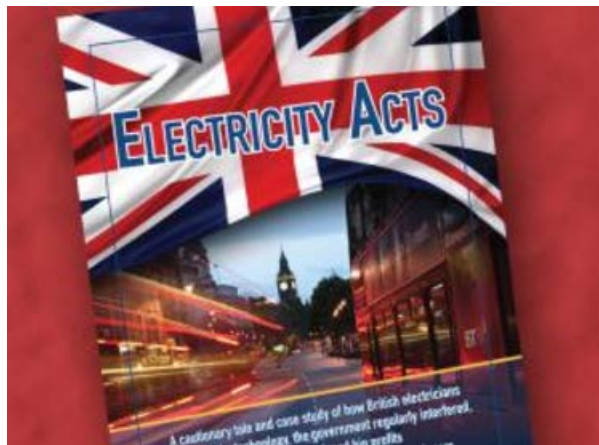


Industry guru, Leonard Hyman, has summed up the industry's conundrum



“Technology will change the business, but we don’t know for sure how”

“And if decentralization and self-generation become the norm, it will become exceedingly difficult to force consumers to pay for the stranded assets at the utility”



“Nobody could make former trolley car passengers pay for a service they did not use anymore, either”

The industry needs to become customer-centric with the rise of the empowered consumer

CUSTOMER CENTRICITY - THE BEST BET FOR SUSTAINABLE COMPETITIVE ADVANTAGE

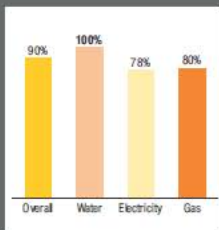


90%

OF UTILITY CXOs BELIEVE THAT THE FOCUS ON THE CUSTOMER HAS INCREASED COMPARED TO 2012

CUSTOMER CENTRICITY IS CLEARLY FRONT OF MIND IN THE UTILITY INDUSTRY

How much has the importance of customer centrality to your company changed over the past five years?



CREATING A NEXT-GEN CUSTOMER EXPERIENCE



CURRENT CUSTOMER CENTRICITY INDEX FOR COMPANIES: 3.8 OUT OF 5

3.8 ► 4.6

THE CUSTOMER CENTRICITY INDEX OF UTILITY COMPANIES IS SLATED TO INCREASE BY 0.8 POINTS

KEEPING CUSTOMERS AT THE CENTRE THROUGH:

- CUSTOMER-CENTRED INTERACTIONS TAILORED FOR EACH CUSTOMER
- INCREASED FOCUS ON MEASUREMENT OF CUSTOMER SATISFACTION



CUSTOMER CENTRICITY INDEX IS HIGHER IN:

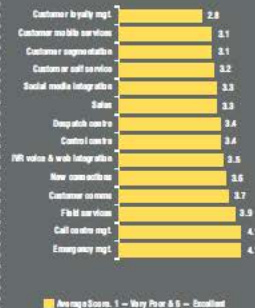


4.1/5 CALL CENTER MANAGEMENT

3.9/5 FIELD SERVICES

BELIEF THAT THE LEVELS OF CENTRICITY TEND TO BE HIGHER IN THE 'FRONT-LINE' SERVICES

Confidentially, on a scale of 1 to 5, please score your company's level of customer centrality in each of the following areas.



HOW DO UTILITY COMPANIES ACHIEVE THIS INCREASED FOCUS ON THE CUSTOMER?

TECHNOLOGY: KEY FOCUS AREA TO DRIVE CUSTOMER CENTRICITY

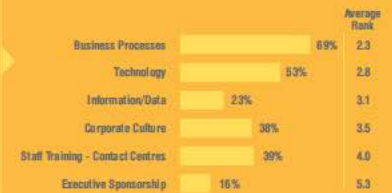


BUSINESS PROCESS IMPROVEMENT: 69%



IMPROVEMENT IN TECHNOLOGY AREAS: 53%

Which of the following areas within your company are most in need of attention to improve customer centrality?



THE TOP RANKING MARKET OPPORTUNITIES ARE ALSO LARGELY TECHNOLOGY BASED



PERVASIVE MOBILE TECHNOLOGY



SERVICE INCENTIVE MECHANISM



SMART METERS

What upcoming or on-going regulatory/market events will provide you with the biggest opportunities to bring change to customer centrality?

Event	Average Rank
Pervasive Mobile Technology	2.0
Service Incentive Mechanism	2.2
Smart Meters	2.9
Fuel Poverty	3.0
Change of Political Landscape	3.3
Climate Change	3.9
Smart Grids	4.8
Green Deal	7.0

AND THE TOP 3 APPLICATIONS THAT NEED TO IMPROVE ARE:



CUSTOMER RELATIONSHIP MANAGEMENT



CUSTOMER SELF-SERVICE PORTALS



CALL CENTER TECHNOLOGY

Which of the following IT applications need to improve if your company is to become more customer centric?

Application	Average Rank
Customer Relationship Management	3.1
Customer Self-Service Portals	3.2
Call Centre Technology	3.8
Field Operations	4.2
Data Management Analytics	4.3
Billing	5.3
Asset Planning Investments	6.1
New Connections	6.2

Source: Centre Forward: Utilities' Progress on Customer Centrality in Utilities - A Wipro and Utility Week Report [READ MORE](#)

Rates are stuck in the past

Cost categories

Variable (\$/MMBtu)

- Gas supply
- Operations & maintenance

Fixed (\$/customer)

- Metering & billing
- Overhead

Size-related (demand) (\$/MMBtu/d)

- Transmission capacity
- Distribution capacity

Utility's Costs

Variable = \$20

Demand = \$40

Fixed = \$30

Customer's Bill

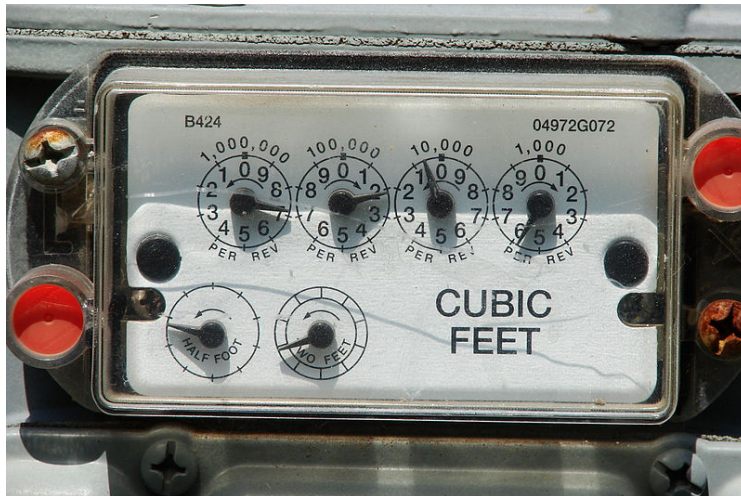
Variable = \$80

Fixed = \$10

Note: Illustrative example for a gas utility.

This transition can help

Traditional meter



Smart meter



...but there is also a need to consider how customers interact with the grid



Residential and commercial gas uses have been dominated by cooking, space heating...

IT DOESN'T COST A CENT to get an estimate on the Gas equipment best suited to your home. Your local Gas Company or Gas Appliance Dealer will cheerfully help you. The many exclusive advantages of modern Gas service have been made possible by the Gas utilities of America, which, through their laboratories and other agencies, are constantly improving their service to you.

AMERICAN GAS ASSOCIATION

GAS

THE MODERN WONDER FUEL

FOR HOUSE HEATING. Gas offers the only completely automatic method of house heating and air-conditioning. Clean, silent. Compact units can be made a part of any room.

FOR WATER HEATING. Automatic Gas Water Heaters give instant, ample hot water 24 hours a day. Need no attention. Run inexpensively.

FOR COOKING. Gas is the fastest, most flexible heat you can use. Modern Gas ranges are smart-looking—have every latest automatic device to make cooking easier, cleaner, better.

FOR REFRIGERATION. Gas Refrigerators are silent—have no moving parts to wear. Give more service for more years at lower cost.

Let **GAS** do the **BIG JOBS** in your home 

... and water heating

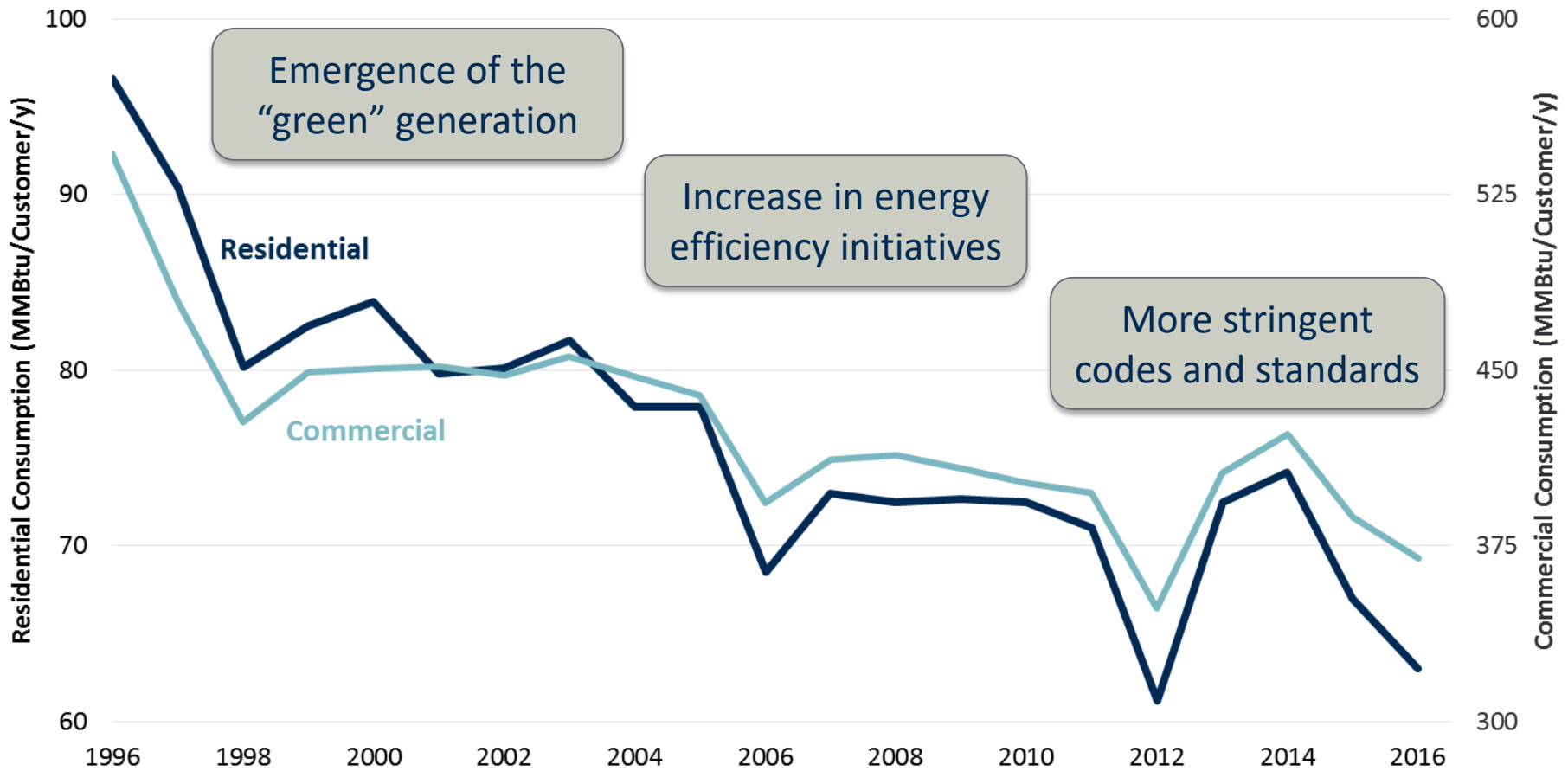
Gas ... the magic of **INSTANT** hot water!

At the turn of a tap, day or night, everyday and everywhere. Gas and only gas can meet your every hot water need—instantly, economically, endlessly—without waste, without work, without waiting!

You'll bless the day **Gas** came to stay!

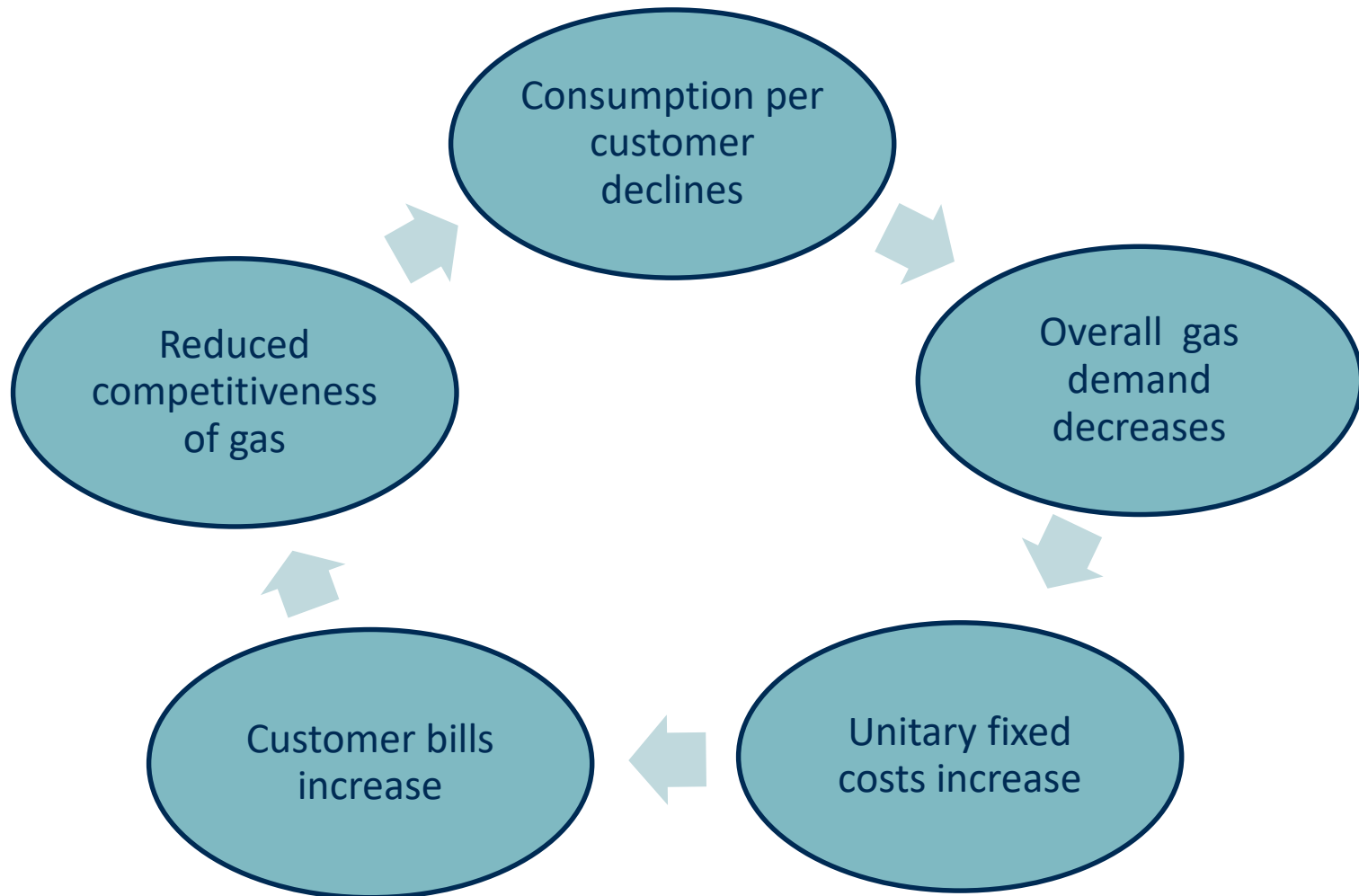
Issued by the Gas Council

Yet use per customer is declining



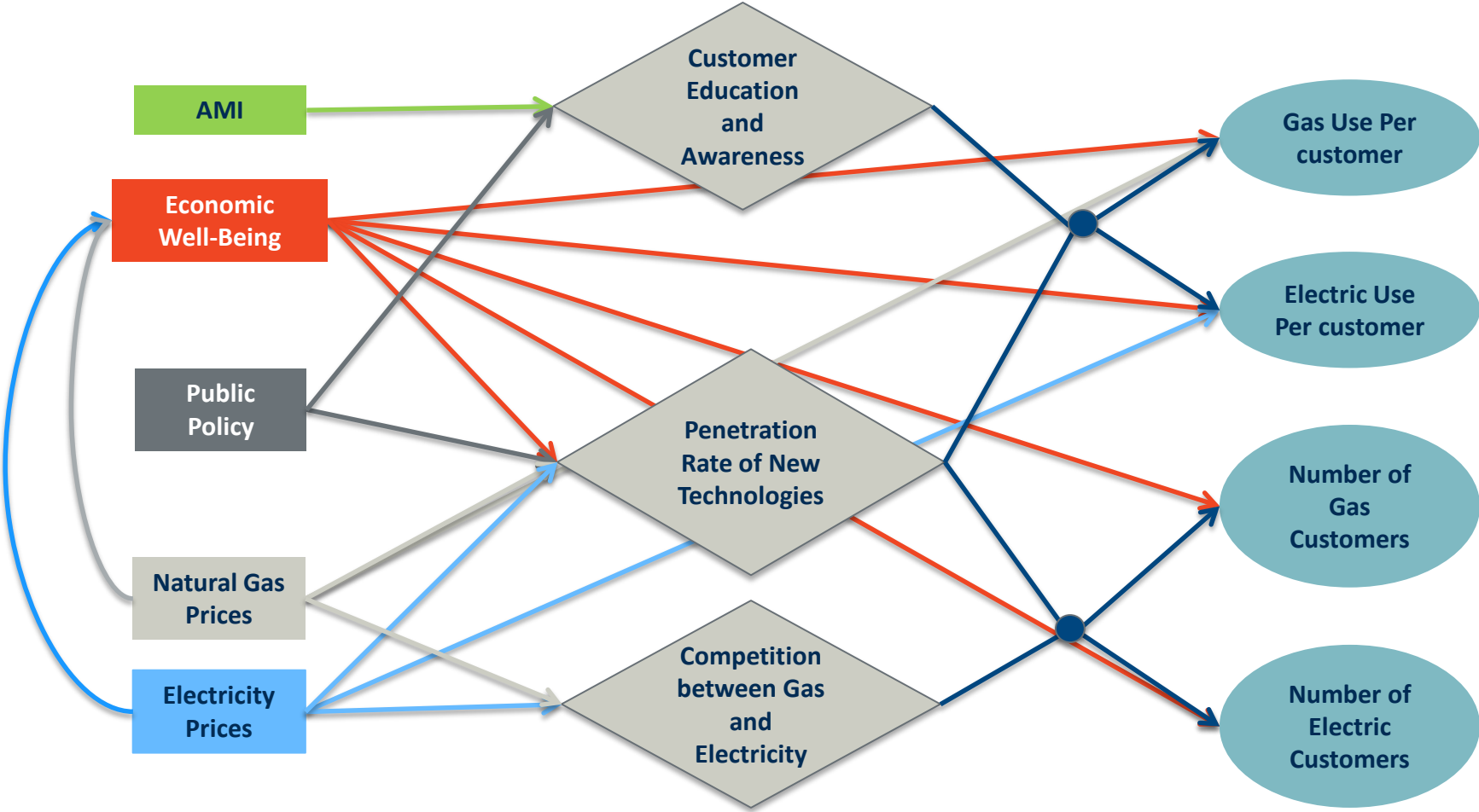
Source: American Gas Association, Table 6-13.

As consumption falls, unitary fixed cost increases, reducing gas competitiveness



There is a lot unknown about the future of the energy industry

Map of Drivers and Output Relationships



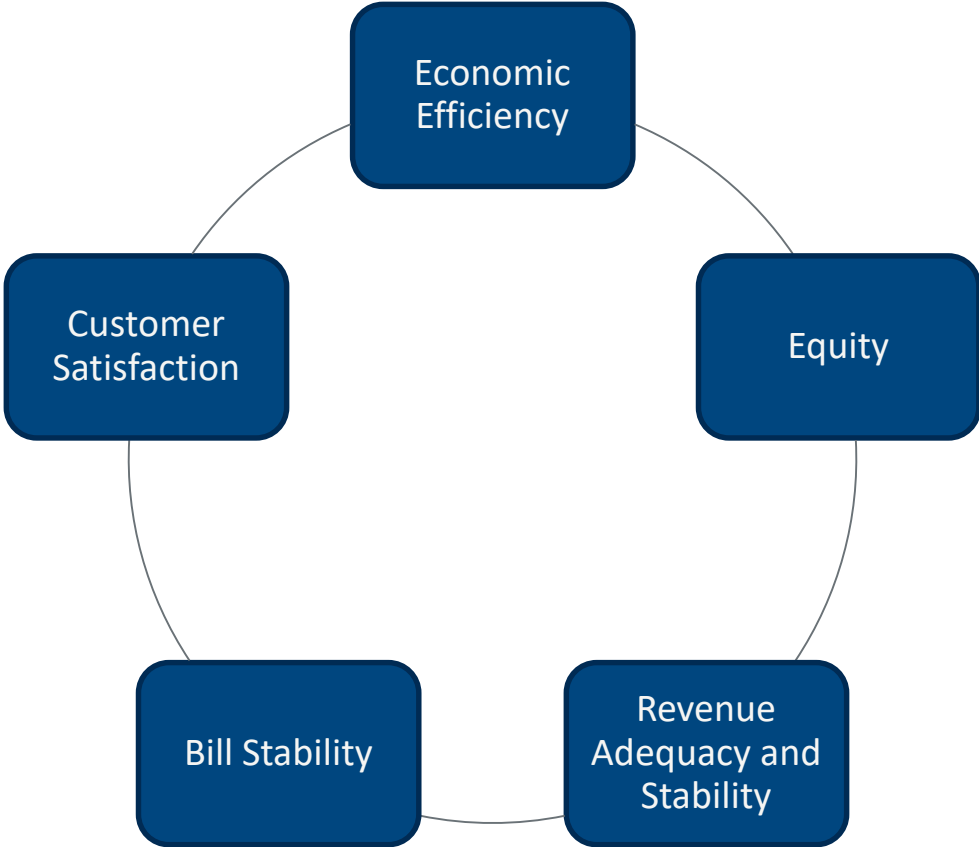
Across the globe, ELECTRIC utilities are experimenting innovative pricing options

<i>Electricity Rate Design Mechanism</i>	Popularity	Requires Advanced Metering?
Demand Charges	Widely used in C&I	Yes
Time-of-Use Charges	Widely used in C&I (sparingly in residential)	Yes
Peak-Shaving Rates	Widely used in C&I (sparingly in residential)	Yes
Higher Fixed Charge	Active proposals throughout US	No
Capacity Charge	Sporadically	Yes
Rates for New Technologies	Growing for both residential and C&I	Preferred

...similarly GAS utilities could offer innovative tariff design

<i>Gas Rate Design Mechanism</i>	Popularity	Requires Advanced Metering?
Demand Charges	Widely used in C&I	Yes
Time-of-Use Charges	None	Yes
Peak-Shaving Rates	Interruptible rates widely offered in large C&I	Yes
Higher Fixed Charge	Some proposals throughout US	No
Capacity Charge	Widely used in C&I	Yes
Rates for New Technologies	Slowly growing for both residential and C&I	Preferred

Pricing of the future will still consider the five core principles of rate design



Utilities are rethinking their tariff design

Recent developments on customers' consumption have motivated some utilities to examine their rates

- Refining customer class definitions to align with current consumption patterns, which can reduce unjustified cross-subsidies
- Pushing the adoption of emerging gas-fueled technologies with tailored rates or introducing new rates to increase utilization during off-peak season

Improved rate design can drive innovation in the industry, raise customer awareness and understanding of the natural gas network, and increase system load

Gas pricing innovations are still quite modest in comparison to electric pricing

Metering infrastructure for the gas and electric grid looks very different

- Almost half of all US households already have advanced electric meters
- Efforts to deploy gas AMI are still limited – most efforts are in conjunction with electric AMI

Gas has storage capability

- Value of flexibility is lower than for electricity

Electric consumer uses are much more diversified

- Gas is primarily used for space and water heating and cooking
- There is less leeway to “shift” consumption or adjust demand by turning off selected appliances

Nonetheless, some change is occurring in gas pricing

Redefining customer classes

Increasing fixed charges

Introducing the notion of demand subscription

Introducing capacity charges

Exploring rates for emerging technologies

Philadelphia Gas Works – Introducing rates for emerging uses and increased fixed charges

PGW made the strategic decision to support the development of specific natural gas uses, including:

- NGV refueling
- Gas Air Conditioning
- Cogeneration (C&I)

Separate rates with financial incentives – on the basis that marginal cost is lower than average costs – could impact the adoption of emerging gas uses

- Diversifying NG uses can help sustain system utilization

PGW was recently granted an increase in fixed charges for its standard Residential, Commercial, and Industrial rates for the first time in eight years

TOU pricing may induce peak-shaving behavior even among gas consumers

A study has been published that simulates the potential of gas TOU pricing for residential customers in Zhengzhou, China on peak-shaving

- Agent-based simulation was used to study the impact of TOU pricing with three time periods: peak, off-peak, and valley
- Key assumptions were made about the short-term price elasticity of gas demand

Main findings:

- Peak shaving efficiency increases as the proportion of consumption during peak hours increases
- The impact on low-income customer and high-income customer bills would be larger than for middle class customers
- Highlights the potential for significant gas operator benefits in a context of increasing demand

Several utilities have implemented opt-in rates for emerging gas uses

Utility	Off-peak Seasonal Rate for Gas AC	Off-peak Seasonal Rate	NGV Refueling Rate	Distributed Generation Rate	Other Emerging Technologies	LNG Rate
Atlanta Gas Light		•	•			
Atmos Energy	•					
Columbia Gas			•	•		
Con Edison	•	•	•	•		
LG&E			•	•		
National Fuel Gas			•	•		
National Grid NY			•			
Nicor Gas		•				
NIPSCO		•				•
NYSEG	•		•	•		
People's Gas			•			
PG&E			•			
Philadelphia Gas Works	•		•			•
RG&E				•		
SDG&E			•			
SoCalGas	•		•		•	
Virginia Natural Gas	•		•			
Yankee Gas		•	•			

Moving ahead with tariff reform (I)

Understand how customer bills will change if the new rates are implemented immediately

- Identify how much bills will rise for small users
- Find ways to mitigate these bill impacts

Simulate the impact of the rates to study the likely customer response

- Models, such as PRISM, are available for carrying out such simulations

Engage in a customer outreach program to explain why tariffs are being changed

- Make sure the new rates use clear and understandable language
- Enlist neutral parties to endorse the change
- Use social media to spread the word

Moving ahead with tariff reform (II)

Change the rates gradually over a three-to-five year period or provide bill protection that is gradually phased out

For the first few years, make the rates optional for low income, small users and disabled customers

- Or provide financial assistance for a limited period of time

Consider a subscription concept in which customers “buy” their historical usage and the historical price and buy or sell deviations from that usage at the new tariffs (transactive energy)

Conduct pilots to test customer acceptance and load response to the new rates

There is a lack of innovation in gas utility tariff design

Storage capabilities on the gas distribution system implies no real time constraint or necessity for time-varying pricing – however, several opportunities still exist to improve gas distribution pricing

Utilities must adapt to changing consumption patterns and competition with electrification

- [Increased alignment](#) between distribution cost structure and customer charges to improve revenue recovery
- Closer [examination of customer class definition](#) and seasonal pricing to improve economic efficiency
- Introduction of [rates for emerging technologies](#) to diversify customer gas uses

Implementation of these practices will help gas utilities adapt to future changes in customer preferences and consumption patterns

Several questions must be answered before moving ahead with tariff reform

What types of new rates should be considered ?

How will customer bills change with the implementation of these new rates?

What will be the customer response to these new rates?

What type of customer outreach programs will be necessary?

Over what period should rates be changed or bill protection be provided to ease the transition?

Should the rates optional for certain customers? For how long?

How should a pilot be designed in order to test customer acceptance and load response to the new rates?

Presenter Information



LÉA GRAUSZ

Associate | San Francisco

Lea.Grausz@brattle.com

+1.415.217.1000

Léa Grausz is an associate in The Brattle Group's San Francisco office. Ms. Grausz has experience in dispute resolution and regulatory proceedings in energy markets, including: upstream natural gas long-term contracting and pricing; gas pipeline ratemaking; liquidity assessment in global oil and gas markets; tariff design for electricity and natural gas; incentive regulation for electric and gas utilities; and assessment of the impact of demand-side management programs.

Prior to joining The Brattle Group, Ms. Grausz worked for four years for Engie in Paris, France where she performed economic analysis for price negotiations and contract arbitrations for long-term gas supply contracts.

About Brattle

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governments around the world. We aim for the highest level of client service and quality in our industry.

We are distinguished by our credibility and the clarity of our insights, which arise from the stature of our experts, affiliations with leading international academics and industry specialists, and thoughtful, timely, and transparent work. Our clients value our commitment to providing clear, independent results that withstand critical review.

Our Practices

ENERGY & UTILITIES

Competition & Market
Manipulation
Distributed Energy
Resources
Electric Transmission
Electricity Market Modeling
& Resource Planning
Energy Litigation
Environmental Policy, Planning
and Compliance
Finance and Ratemaking
Gas/Electric Coordination
Market Design
Natural Gas & Petroleum
Nuclear
Renewable & Alternative
Energy

LITIGATION

Accounting
Analysis of Market
Manipulation
Antitrust/Competition
Bankruptcy & Restructuring
Big Data & Document Analytics
Commercial Damages
Environmental Litigation
& Regulation
Intellectual Property
International Arbitration
International Trade
Labor & Employment
Mergers & Acquisitions
Litigation
Product Liability
Securities & Finance
Tax Controversy
& Transfer Pricing
Valuation
White Collar Investigations
& Litigation

INDUSTRIES

Electric Power
Financial Institutions
Natural Gas & Petroleum
Pharmaceuticals
& Medical Devices
Telecommunications,
Internet, and Media
Transportation
Water

Offices



BOSTON



NEW YORK



SAN FRANCISCO



WASHINGTON, DC



TORONTO



LONDON



MADRID



ROME



SYDNEY