

STAKEHOLDER PERSPECTIVES ON DISTRIBUTION TARIFF REFORM

Presented by: Ryan Hledik Elias Curi

3 July 2019



THE Brattle GROUP

QUANTUM

Distribution tariff reform is needed

Emerging adoption of distributed energy technologies

- Rooftop solar
- Electric vehicles
- Energy storage
- Smart metering
- Smart appliances

Rates that have not changed in 100 years

- Flat volumetric charge
- Small fixed charge

Missed opportunities for customers and utilities

- Unintended crosssubsidies
- Under-recovery of costs
- No consumer incentive to invest in demand response technologies



Improved tariff design presents new opportunity

Emerging adoption of distributed energy technologies

- Rooftop solar
- Electric vehicles
- Energy storage
- Smart metering
- Smart appliances



- Time-varying rates
- Demand-based rates
- Location-specific incentives
- Rate choice

Consumer benefits, a more efficient grid

- Reduced system costs
- Fair cost-recovery
- Incentives to invest in most beneficial technologies



Internationally, four tariff reform options are commonly considered

- 1. Shift revenue collection to a **fixed** charge
- 2. Introduce demand-based charge
- 3. Make the volumetric charge time-varying
- 4. Replace net energy metering with net billing

The challenge is in balancing competing priorities

Cost Reflective

What is the maximum acceptable change in customer bills during the transition to more cost based tariffs?

At what point is a cost reflective tariff too complex for customers to understand?

Bill Impact

Do simple tariffs lead to significant over/under-payment by certain customer segments?

Simplicity/ Acceptability



Stakeholders view tariff reform options very differently

Observed Stakeholder Support for Tariff Reform Options

	Rooftop Solar	Energy Efficiency	Low Income Consumer	Electric Vehicles
Increased fixed charge	0	0	O ¹	•
Demand charge	0	•	O ¹	\bigcirc^2
Time-varying volumetric charge			O ¹	
Net billing	•	N/A	•	N/A

Notes:

- [1] Support would increase if the rate is offered to DG customers as a separate class
- [2] Support would increase if the demand charge is restricted to peak hours



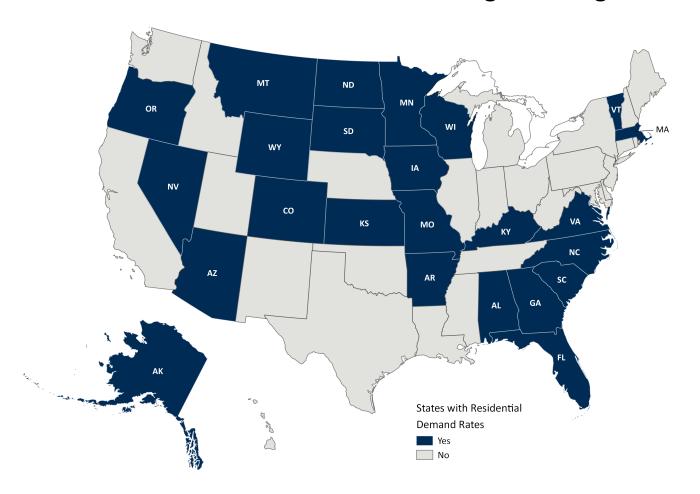
Top three stakeholder concerns

- 1. "Customers will not accept new tariff designs"
- 2. "Customers cannot understand the new tariff designs"

3. "Bills will increase for low-income customers"

Customer acceptance of new tariff designs

U.S. Residential Demand Charge Offerings



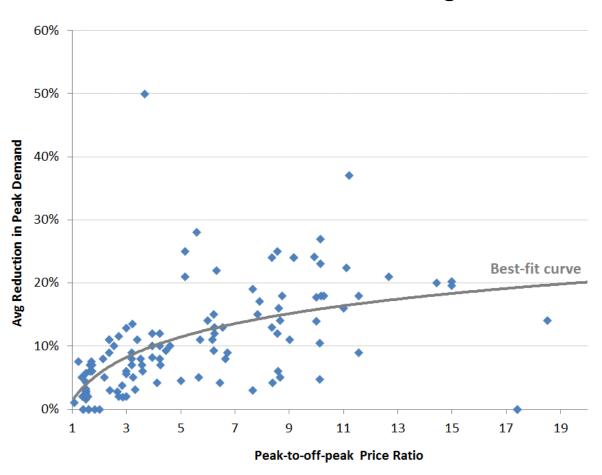
A variety of modern rate designs have reached high adoption levels internationally

- Arizona Public Service has exceeded 10% enrollment in optional residential demand charge
- Demand charges have been mandatory for rooftop solar customers in Arizona and Kansas, and are proposed in Montana
- OGE reached 20% voluntary enrollment in Variable Peak Pricing
- Ontario, Canada has a default TOU tariff; California will soon



Customer understanding of new tariff designs

Results of International Pricing Pilots

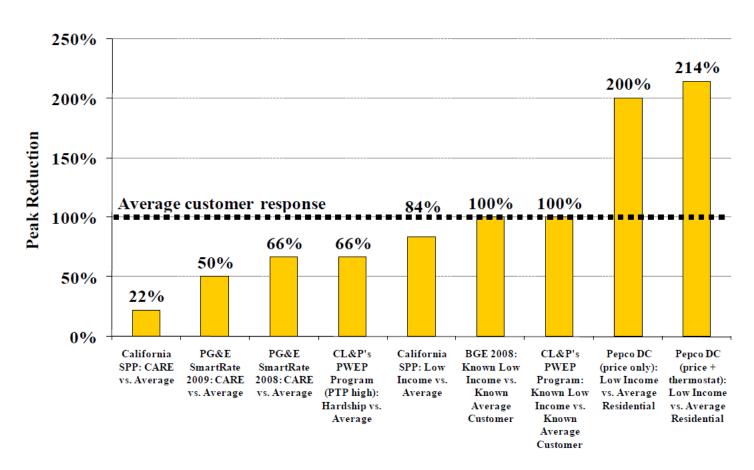


- 300+ international pricing tests have found that customers respond to new tariff designs
- Price response persists for multiple years
- New tariffs can be explained to customers in simple terms:
 - "Save money by reducing usage between 3 pm and 7 pm"
 - "Avoid using several electric appliances at the same time"



The impact on lower-income customers

Price Responsiveness of Low-Income Customers



- Empirical evidence shows that low income customers do respond to price, sometimes more than the average customer
- Low income customers are not necessarily small customers; they often automatically benefit from the transition to a new tariff
- Financial assistance can be provided outside the tariff design



Moving forward with tariff reform

Primary
Research

Pilots

Focus groups and surveys

Bill impact analysis

Load impact analysis

Moving forward with tariff reform

Primary Research

- Pilots
- Focus groups and surveys
- Bill impact analysis
- Load impact analysis

Proactive Outreach

- Stakeholder involvement
- Regulatory outreach & coordination
- Customer education plans

Moving forward with tariff reform

Primary Research

- Pilots
- Focus groups and surveys
- Bill impact analysis
- Load impact analysis

Proactive Outreach

- Stakeholder involvement
- Regulatory outreach & coordination
- Customer education plans

Pragmatic Transition

- Objective-based rate design
- Protections for vulnerable customers
- Tools to facilitate demand management
- Methods to introduce the rate gradually



Main four tariff reform options in Brazil



1. Shift revenue collection to a fixed charge

"Custo de Disponibilidade": 30 - 50 - 100 kWh - Must be paid even without consumption.

Disadvantages:

- Higher incidence of taxes (ICMS) on a minimum bill with consumption lower than that billed,
- It do not correct the current cross-subsidies in the recovery of responsibility in the use of the system capacity, among customers with different load factors.
- 2. Introduce demand-based charge
- "Tarifa Binômia": In discussion Current tariff are volumetric.
- Involves a very sensitive and comprehensive process that impacts about 90% of Brazilian customers.



Main four tariff reform options in Brazil



3. Make the volumetric charge time-varying

"Tarifa Branca": TOU tariff with 3 time-periods.

- Currently available for LV clients, with consumptions under 250 kWh/month.
- In 2020 would be available for all LV customers.
- 4. Replace net energy metering with net billing

Current Net Metering scheme is now in discussion to be replaced by a Net Billing approach. Highlighting points of current scheme:

- Limit of 5MW.
- Allows: exchange of energy credits between different units of a same client,
 - shared generation and
 - remote self-consumption.



Top discussions and stakeholder concerns in Brazil



"Demand charges as the new tariff design for LV customers"

- Debate focused in meter replacement, but there are other options
- Smart meters mandatory for prosumers
- Raising concern on fixed charges to ensure fixed costs collection

"Deployment of TOU rate: (Tarifa Branca)"

- Utilities concerns about the optional character of the tariff (adverse selection) and risks on revenues recovery
- Customer concerns about the "real" bill impact and its ability to modulate consumption

"Net Metering been replaced for Net Billing"

- ANEEL presented several alternatives of Net Billing tariff's design
- Stakeholder concerns are aligned to international experience
- Debate about considering GD just as another energy efficiency action



Thank you!

