Enabling Grid Modernization
Through Alternative Rates and Alternative Regulation

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PRESENTED TO
Energy Policy Roundtable in the PJM Footprint
November 29, 2018
Agenda

Introduction

Alternative Rates in Maryland

Trends in Grid Modernization Efforts

Alternative Regulation- Why Now?
Rate design is ripe for a change

Problems caused by the volumetric and static rate structures have become too big to ignore
• Falling load factors, driven by falling sales and rising peak loads
• DERs will continue to exacerbate the mismatch between revenue and costs

Regulatory pressures are mounting
• Push for grid modernization, increased DER penetration, greater customer choice, and greater system efficiency

Customer needs are changing rapidly
• Seamless integration of technologies with the grid at the same level of reliability they have today
• Expect customized and personalized rate options
Behavioral economics tells us that customers have diverse preferences.

Market research studies and surveys undertaken in the context of time-based pricing pilots reveal valuable insights on customer preferences.

Some want the lowest price
• They are willing to be flexible in the manner in which they use electricity

Some want to lock in a guaranteed bill
• They are willing to pay a premium for peace-of-mind

Many others are in between these two bookends
• Some might want a guaranteed bill but may be willing to lower it if rebates are offered for reducing demand during peak periods
• Others may wish to subscribe to a given level of demand

All customers want choice but they only want what they want.
Time Varying Pricing in Maryland

Both BGE and PHI offer peak time rebates of $1.25/kWh to their customers in Maryland (~2 million households), and bid in the load reductions into the PJM capacity market.

- **2008**, BGE initiated Smart Energy Pricing Pilot
  - Tested customer response to PTR and CPP rates side by side

- **2009-2012**, SEP pilots continued
  - Tested various forms/levels of PTR, with and without technology
  - Tested persistence of impacts

- **2013**, Default PTR program, Smart Energy Rewards, was rolled out
  - About 80% of customers have earned rebates and saved $40 million since 2013

The average peak reduction across SER rebate earning customers has been quite consistent since 2013, ranging from 13.7% in 2013 to 15.3% in 2017.
A new TOU pilot will be deployed in Maryland in the Spring of 2019

The two-year TOU pilot is being developed as part of the Maryland PSC’s Public Conference 44 (PC44) effort, and will be executed by BGE, Pepco and Delmarva Power, the “Joint Utilities” of Maryland

The primary objective of the pilot is to determine if TOU rates can help lower customer bills, especially for low to moderate income (“LMI”) customers

The pilot is currently addressing customers taking Standard Offer Service (SOS), however there is also another one under consideration for customers receiving service from a retail supplier

The SOS pilot will feature cost-based TOU SOS rates and TOU delivery service rates
## PC 44 TOU Pilot Design

<table>
<thead>
<tr>
<th></th>
<th>Summer (June 1 – September 30)</th>
<th>Non-Summer (October 1 – May 31)</th>
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<tbody>
<tr>
<td>On-peak</td>
<td>2pm-7pm on weekdays</td>
<td>6am-9am weekdays</td>
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<tr>
<td>Off-peak</td>
<td>All other hours are off-peak, including holidays and weekends</td>
<td>All other hours are off-peak, including holidays and weekends</td>
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### Example Rates as Listed in Final Work Group Report

- Targeted sample size for each utility is 4,020 of which 1,608 will be represented by LMI customers
- Sample sizes were determined using statistical power calculations
A few U.S. utilities (SMUD, the City of Fort Collins) have already started to transition their residential customers to default TOU rates and California IOUs are gearing up to do so in 2020

However, there are still a few unsettled questions, which PC44 TOU pilot aims to answer and advance our state of knowledge by:

- Testing the impact of TOU on LMI customers on a sufficiently large sample size to yield conclusive results
- Applying TOU rates on both the energy and delivery charges with a sizable peak/off-peak ratio and increasing the portion of the bill that is subject to the TOU rate
- Understanding customer satisfaction with opt-in TOU rates
## Trends in Grid Modernization Efforts

We recently reviewed 21 recent grid modernization initiatives; of which 10 could be reviewed in sufficient detail to reveal trends. This review showed:

<table>
<thead>
<tr>
<th>Driver</th>
<th>Regulatory Approval</th>
<th>Process</th>
<th>Cost Recovery</th>
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<tbody>
<tr>
<td>• Most grid modernization efforts were initiated in response to local or state policy requirements;</td>
<td>• Regulatory approvals were mostly based on standardized benefit-cost tests, such as the Total Resource Cost (TRC) test</td>
<td>• Obtaining regulatory approvals took 13 months on average</td>
<td>• The majority of utilities go through general rate case filings for cost recovery</td>
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<tr>
<td>• Some were based on utility initiatives</td>
<td>• Some received approvals based on break-even analysis; proof of cost prudence and foundational nature of investments for other utility initiatives to move forward</td>
<td>• Significant delays were due to incomplete benefit-cost analysis and strong stakeholder oppositions</td>
<td>• However, there are a number of utilities that rely on formula rates and rate riders to address regulatory lag.</td>
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<td></td>
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<td>• Some jurisdictions used PBR and performance incentive mechanisms in combination with the cost recovery of grid modernization investments</td>
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(See Sergici et al., “Reviewing the Business Case and Cost Recovery for Grid Modernization Investments: Summary of Recent Methods and Projects,” prepared for NEMA, forthcoming)
Alternative Regulation- Why Now?

Under the traditional utility business / regulatory model:
  - Growing sales enabled utility to continue capital investment while keeping rates in check
  - Utility earnings were facilitated by necessary growth in rate base

This model is **not sustainable** in many jurisdictions as the foundational pillars of the model have been dissolving:
  - Sales growth rate has slowed (or reversed)
  - Aging assets and calls for grid modernization lead to increasing costs
  - Productivity growth is relatively flat

Industry participants are not satisfied with results
  - Utilities: Declining sales + regulatory lag = under-earnings
  - Customers: Looking for alternative ways to deal with cost pressures, beginning to voice interest in choice and alternative providers of some energy services
Alternative Regulation - Why Now? (cont’d)

- Regulators/policymakers:
  - Need for rate increases raises concerns about (lack of motivation for) control on costs and capital spending; exacerbated by grid modernization efforts
  - Evolving goals may require utilities to provide access to the (physical or virtual) grid
  - Concerns about resilience (in a world of more frequent extreme events)

These recent changes in the industry environment have prompted many regulators to call for more proactive investigation of PBR options

- E.g., NY, Michigan, Hawaii and only recently Ohio and Pennsylvania
**PBR in Perspective**

**PBR (or incentive regulation)** refers to a regulatory mechanism that creates a stronger connection between utility performance (e.g., cost, operations, policy goals) and earnings.

<table>
<thead>
<tr>
<th>Goal</th>
<th>Incentive Area</th>
<th>Mechanism</th>
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</thead>
<tbody>
<tr>
<td>1) Cost/Price Control</td>
<td>Overall financial performance</td>
<td>Broad-based Incentive Frameworks</td>
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<tr>
<td></td>
<td></td>
<td>Multi-year Rate Plans (MRPs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(e.g., price caps, RPI-X)</td>
</tr>
<tr>
<td>2) Targeted Performance or Policy Goals</td>
<td>“Traditional” operational areas (e.g., SAIDI)</td>
<td>Narrower Incentive Mechanisms</td>
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<tr>
<td></td>
<td>“Emerging” performance targets (e.g., increased EE, decreased DER interconnection time, etc.)</td>
<td>Performance Incentive Metrics (PIMs)</td>
</tr>
<tr>
<td>3) Investment Incentives (e.g., Grid Modernization, Reliability, Resilience)</td>
<td>Risk Reduction</td>
<td>Supplemental Incentives (e.g., Capex Riders, formula rates)</td>
</tr>
</tbody>
</table>
PBR In Perspective (cont’d)

- Has been in use for some time; relatively widely applied in the U.S. and abroad
- Builds on incentive structures used in traditional rate of return regulatory methodology
- Some renewed attention as a result of changes in the industry environment, interest in advancing policy goals and keeping customer rates affordable
- This trend is expected to continue as the urgency of grid modernization investments increase
PBR plans are actually composed of traditional rate of return regulation with one or more PBR-type mechanisms added on.

### Regulatory Framework

Traditional RoR + Combinations of PBR Elements

<table>
<thead>
<tr>
<th>Utility</th>
<th>State</th>
<th>Traditional RoR</th>
<th>&quot;I – X&quot;</th>
<th>Other</th>
<th>Traditional</th>
<th>Emerging</th>
<th>Formula Rates</th>
<th>Broad Capex Mechanisms</th>
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<tr>
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Customers, utilities and policymakers have overlapping motivations for and potential benefits from PBR.

Benefits/Motivations for PBR:

- **Customers**:
  - Enable Distributed Resources
  - Develop Resilient and Secure Systems
  - Improve/Maintain System Reliability
  - Development of New Business Models
  - Opportunity to Align Financial Goals with Performance
  - Less Frequent Rate Cases
  - Rate Predictability
  - Performance Standards
  - Stable Rates
  - Implement Renewable Energy & GHG Goals
  - Improve/Maintain Customer Satisfaction
  - Cost Control
  - Incentives for Innovation
  - Develop Resilient and Secure Systems

- **Utilities**
  - Opportunity to Align Financial Goals with Performance
  - Development of New Business Models
  - Implement Renewable Energy & GHG Goals

- **Policymakers**
Dr. Sanem Sergici is a Principal in The Brattle Group’s Boston, MA office specializing in program design, evaluation, and big data analytics in the areas of energy efficiency, demand response, smart grid and innovative pricing. She regularly supports electric utilities, regulators, law firms, and technology firms in their strategic and regulatory questions related to retail rate design and grid modernization investments.

Dr. Sergici has been at the forefront of the design and impact analysis of innovative retail pricing, enabling technology, and behavior-based energy efficiency pilots and programs in North America. She has led numerous studies in these areas that were instrumental in regulatory approvals of Advanced Metering Infrastructure (AMI) investments and smart rate offerings for electricity customers. She also has significant expertise in development of load forecasting models; ratemaking for electric utilities; and energy litigation. Most recently, in the context of the New York Reforming the Energy Vision (NYREV) Initiative, Dr. Sergici studied the incentives required for and the impacts of incorporating large quantities of Distributed Energy Resources (DERs) including energy efficiency, demand response, and solar PVs in New York.

Dr. Sergici is a frequent presenter on the economic analysis of DERs and regularly publishes in academic and industry journals. She received her Ph.D. in Applied Economics from Northeastern University in the fields of applied econometrics and industrial organization. She received her M.A. in Economics from Northeastern University, and B.S. in Economics from Middle East Technical University (METU), Ankara, Turkey.

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