



MASSACHUSETTS
**DEPARTMENT OF
ENERGY RESOURCES**

Multi-Year and Formula-Based Rates

Expert Presentation Series | September 29, 2025

This expert level presentation series session will provide the Massachusetts Electric Rate Task Force an opportunity to learn from experts and/or other jurisdictions on the above topic.

Note: The contents of this presentation do not necessarily reflect the views or positions of the Massachusetts Department of Energy Resources.

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Massachusetts Electric Rate Task Force Goals

The Rate Task Force brings together diverse stakeholders to reimagine how electric rates and the regulatory framework can drive an affordable, equitable, and decarbonized energy future.

Through targeted conversations, expert presentations, and thoughtful exploration of complex issues, the Task Force aims to deepen understanding, surface critical questions, clarify challenges, and build the foundation for durable regulatory reform and action.

The Rate Task Force will use the Massachusetts Interagency Rates Working Group's Long-Term Ratemaking Study and Recommendations as a starting point for discussion and knowledge building on rate designs, ratemaking, and regulatory mechanisms.

Build technical knowledge

Provide an opportunity for **knowledge-building** by and amongst stakeholders, including those who have not traditionally been involved



Develop shared understanding

Converge towards **shared understandings** of the challenges and priorities



Facilitate open, inclusive dialogue

Engage in **open, inclusive dialogue** about complex ratemaking and regulatory issues outside of a regulatory proceeding



Frame critical questions and opportunities

Empower stakeholders to identify **critical questions and opportunities** for the advancement of rate design and ratemaking reform



Today's Focus

Ground Rules & Engagement

This work is complex – and your insight matters; let's focus on learning, listening, and shaping together!

Participation, Engagement, & Respect

- Everyone's perspective is valuable – this space works best when all voices are heard
- Respect differences in background, experience, and priorities
- Bring curiosity – ask questions and offer potential answers
- Focus on understanding others' goals and values, not just their positions
- It's okay not to have a solution – help us shape the right questions

Collaboration, Not Consensus

- This body is deliberative, it is not a decision-making space
- We don't need to agree on everything, but we should work toward shared understanding
- Where we disagree, help clarify what the tension is and why it matters

Transparency & Trust

- We'll be clear about how input is used
- Share what you can; identify when you're speaking on behalf of your organization or personally
- Materials, summaries, and key findings will be shared openly to support accountability

Focus & Productivity

- Stay on topic and honor the scope of the Task Force
- Raise related concerns, but help us stay anchored in the rate design and regulatory issues at hand
- Use the structures provided (i.e., expert sessions, targeted conversations, office hours) to deepen discussion
- Avoid discussion about open and ongoing proceedings at the DPU



Expert Presentations

I. Performance-Based Regulation in Massachusetts

Massachusetts EDCs

Present on the current application and operation of utilities' revenue cap (I-X) formulas and supporting mechanisms in Massachusetts

II. Multi-Year and Formula-Based Rates

Pacific Economics Group, Mark Newton Lowry

Present on the theory and application of multi-year rate plans and formula-based rates for electric distribution companies

III. Multi-Year Rate Plan and Performance-Based Regulation Approaches

Current Energy Group, Matthew McDonnell

Present an overview of peer jurisdictions that have implemented various PBR revenue adjustment, including MYRPs, ESMs, and approaches to capital expenditure and operation expenditure

IV. Consumer Advocate Perspective on Multi-Year Rate Plans

Maryland Office of People's Council, David Lapp

Present analysis and position on multi-year rate plans and formula-based rates, in addition to lessons learned from Maryland's pilot multi-year rate plan

Reminder

Expert presentation sessions are not for substantive deliberation amongst participants. Questions for each speaker will be taken as time allows.



Primer on Performance-Based Ratemaking

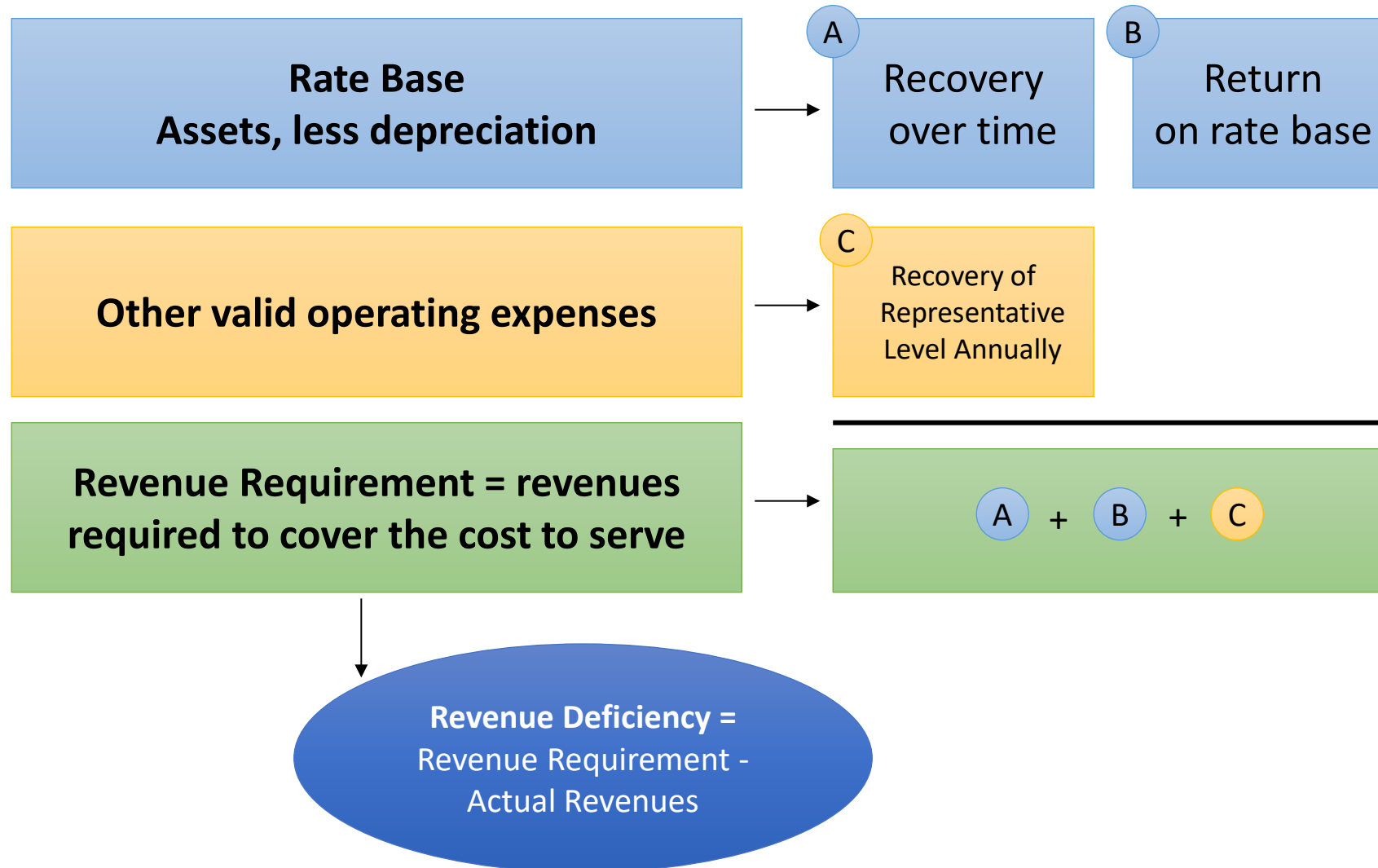
September 2025

Agenda

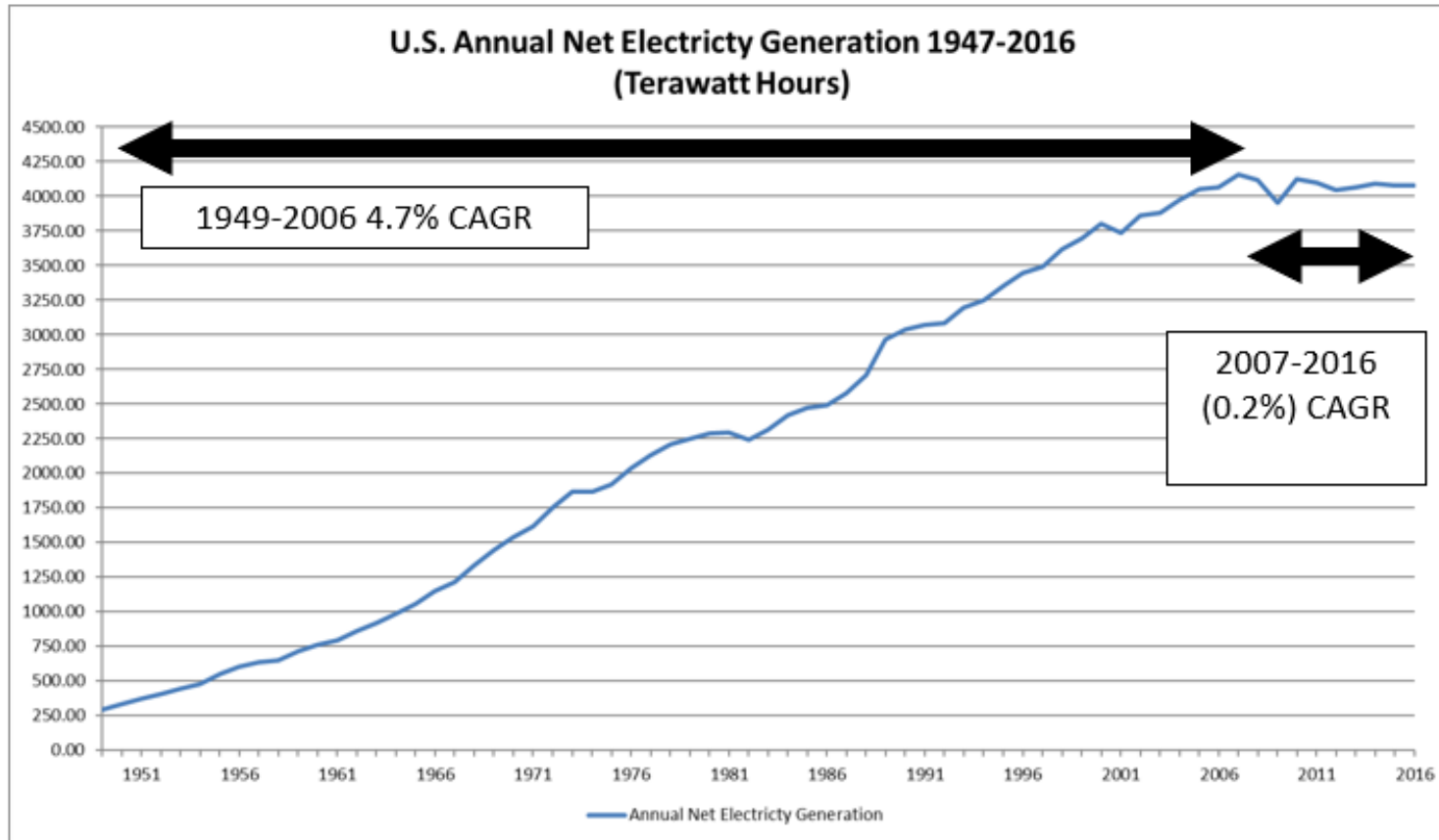


- Background on Revenue Requirements and Decoupling
- Design of Performance-Based Rate Plans

One critical outcome of a rate case is approval of the utility's Revenue Requirement



The historical regulatory model works when sale increases keep pace with costs. It does not when sales are flat.



Revenue		-	Costs	=	Net Income
Rate x	Volume (kWh)				
Same	Same		↑		↓
Same	Same		↓		↑
Same	↑		Same		↑
Same	↓		Same		↓

Same = Same level as test year

Utility costs continue to increase, particularly with electrification, Distributed Energy Resources and other climate change policies.

This required a change in the utility rate model versus traditional cost of service ratemaking.

Decoupling eliminates disincentive to pursue initiatives that lower energy consumption for customers



Revenue Decoupling ‘decouples’ revenues from sales

“Fixes” the level of revenues at the approved revenue requirement

- No longer provides increases to fund the rising cost of service

- Intended to remove the disincentive to promote EE

Regulators have implemented various regulatory mechanisms to provide incremental revenues between rate cases

- Capital cost recovery mechanisms

- Multi year rate plans

- Step adjustments / future test years

- **Performance-Based Rate Plans, focus of the discussion today**

What is Performance-Based Ratemaking?



- PBR is a form of alternative regulation that provides for stronger incentives over traditional cost of service (COS) regulation
- Formulaic, index-based approach in the form of “ $I - X$ ”, where I is a measure of inflation and X is the “productivity factor”
- PBR establishes a ceiling on one of the following:
 - Prices
 - Revenue per customer
 - Revenues

The “I-X” Index Formula



- “I – X” represents growth in industry unit cost
 - The “I factor” – Economy-wide output inflation (*e.g.*, GDP-PI) – used in most US plans
 - The “X factor” – productivity growth

PBR provides strong cost control incentives, customers benefit

- 
- Provides proper incentives and flexibility to optimize capital deployment and aggressively pursue cost saving opportunities
 - Changes “cost plus” mindset of traditional cost of service regulation requiring frequent rate cases
 - PBR terms should be a period of years to allow time to achieve costs savings
 - Companies are allowed to keep savings early in term, which benefit customers at the next rate case. Customers benefit through lower costs over time.
 - Performance is maintained through appropriate metrics to track progress toward policy initiatives

Other PBR Plan elements



- Consumer Dividend
- Multi year stay-out provision
- Reopeners/off-ramps
- Earnings sharing
- Exogenous adjustments
- Capital cost recovery mechanisms (including K-bar adjustment)
- Efficiency carryover mechanisms
- Targeted performance incentives

MA Utilities have adopted various forms of PBR

	Component	Eversource (revenue-cap)	Unitil (revenue-cap)	National Grid (revenue-cap – O&M only)
Term	Stay-out period	5 years, with option to request 5-year extension	5 years	5 years
I	Measure of inflation	Gross Domestic Product Price Index (GDP-PI), with 5% cap and 0% floor	GDP-PI, with 5% cap and 0% floor	Weighted average of ECI-Northeast Utility Labor Index and Producer Price Index for Electric Utilities, with 5% cap and 0.21% floor
X	Productivity factor	0	0	0.21
CD	Consumer dividend	0.25 when inflation exceeds 2%	0.25 when inflation exceeds 2%	0.40 when inflation exceeds 2%
Z	Exogenous cost mechanism	Individual event must exceed threshold set at \$4 million, adjusted for inflation	Individual event must exceed threshold set at \$110k, adjusted for inflation	Individual event must exceed threshold set at \$3.6 million, adjusted for inflation
ESM	Earnings sharing mechanism	If earnings exceed 100 bps of authorized ROE, 75% will be shared with customers	If earnings exceed 100 bps of authorized ROE, 75% will be shared with customers	If earnings exceed 100 bps of authorized ROE, 75% will be shared with customers

Questions?

Multiyear and Formula-Based Rates

Massachusetts Electric Rate Task Force
29 September 2025

Mark Newton Lowry, PhD, President

Matt Makos, Senior Consultant

Pacific Economics Group Research, LLC

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Introduction

The Massachusetts Electric Rate Task Force is exploring, through expert presentations, the outlines of a new comprehensive rate framework for power distributors.

Spurred by Commonwealth energy objectives and other business conditions, large new investments in distribution capacity, smart grid capabilities, and reliability are expected to cause rapid cost growth.

Alternatives to traditional ratemaking (“Altreg”) are designed for these circumstances.

The DPU has for many years used multiyear rate plans (“MRPs”) in power distributor ratemaking.

This presentation briefly discusses the design of MRPs and how these plans can help address Commonwealth challenges.

Multiyear Rate Plans

MRPs are complex regulatory systems with key components and optional “bells and whistles”.

Key Components

- First year rates are usually based on general rate case.
- Rate case moratorium (e.g., 3-5 year rate case cycle)
- Between rate case adjustments, an attrition relief mechanism (“ARM”) provides rate relief for utility financial attrition using *predetermined formulas that aren’t linked* (like a cost tracker or cost of service formula rate) *to utility’s contemporaneous cost growth*.

>>> Stronger utility cost containment incentives

Streamlined ratemaking

- Large volatile costs (e.g., energy) get tracker treatment.
- Targeted performance incentive mechanisms (“PIMs”) for “blue-sky” reliability

Multiyear Rate Plans (cont'd)

Optional “Bells and Whistles”

- Additional performance metrics (e.g., for affordability) and PIMs (e.g., for DSM and cost management)
- Revenue decoupling or a lost revenue adjustment mechanism
- Trackers for government-mandated programs
- Utilities tend to underuse certain inputs and practices, like those that reduce utility capex opportunities (e.g., DSM, power purchases, facility maintenance, cloud computing), tracked costs, and externalities. Targeted incentives for underused practices gives utilities a “nudge” to pursue these practices (e.g. track the cost of DSM).

>>> MRP can be a platform for other kinds of performance-based ratemaking (“PBR”)

- Integrated distribution system planning is complementary to MYRPs

In US, MRPs first used for railroads and telecom utilities.

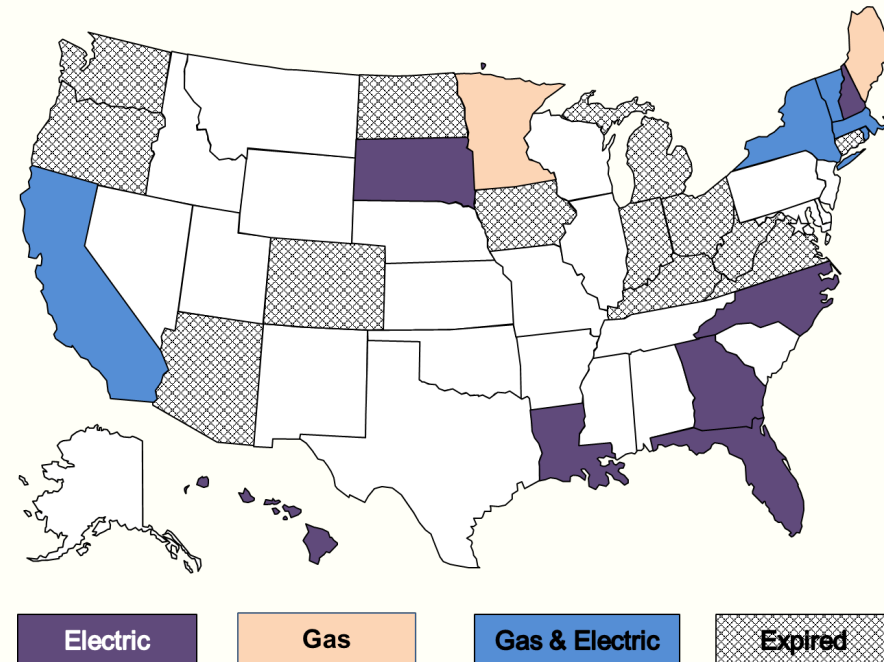
MRPs now popular for retail electric utility rates.

California and Northeast were MRP pioneers.

Today's MRP "hotspots" include CT, NH, OR, and WA.

MRPs are more popular abroad (e.g., Great Britain, Australia, New Zealand, and Canada).

MRP Precedents



Rate plans in DC, IL, MD, and now OH have been called MRPs but are better described as FERC-style cost of service formula rates due to fine-print "reconciliation mechanisms."

These mechanisms are now outlawed in MD after experience with them there.

ARM Design Options

Several approaches to ARM design are well-established.

These provide many options when coping with energy policy challenges.

1. Indexed ARMs

Design of revenue cap indexes (“RCIs”) based on cost theory¹

$$\text{growth Cost} = \text{growth Input Prices} + \text{growth Operating Scale} - \text{growth Productivity}^1$$

A common RCI formula is

$$\begin{aligned} \text{e.g., } \text{growth Revenue Requirement} = & \text{growth GDPPI} + \text{growth Customers} \\ & - X \text{ Factor} - \text{Stretch Factor} + Y + Z. \end{aligned}$$

X factor customarily reflects industry total factor productivity trend. It also reflects tendency of GDPPI to understate input price inflation (although this could be a separate term in the formula).

Indexes compatible with historical or forecasted test years

¹ Denny, Michael, Melvyn A. Fuss and Leonard Waverman (1981), “The Measurement and Interpretation of Total Factor Productivity in Regulated Industries, with an Application to Canadian Telecommunications,” in Thomas Cowing and Rodney Stevenson, eds., *Productivity Measurement in Regulated Industries*, (Academic Press, New York) pages 172-218.

1. Indexed ARM (cont'd)

Productivity growth reflects external cost drivers (e.g., system age) as well as operating efficiency.

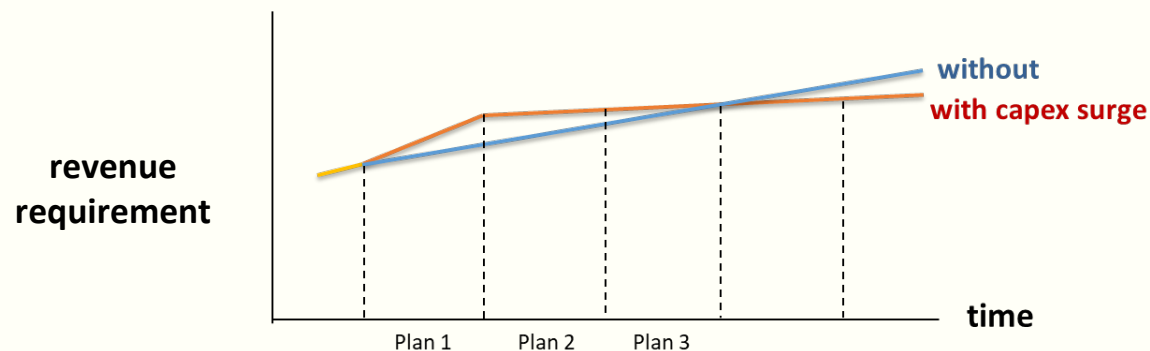
Industry productivity trend can be negative

Recent PEG estimates of power distributor productivity trends [15 years (2009-2023)].

	O&M	Capital	Multifactor
U.S.	0.75%	-0.23%	0.08%
U.S. ex California	0.94%	-0.17%	0.18%
U.S. Northeast	0.11%	0.07%	0.04%

Indexed ARMs designed to reflect long term productivity trends cannot fund capex surges

>>> Utilities frequently ask for supplemental capital revenue to fund surges and often get it.



1. Indexing Formula (cont'd)

Stretch factor shares benefit of stronger performance incentives with customers

Often based on statistical benchmarking

Studies filed in Massachusetts MRP proceedings are surprisingly rudimentary

Studies filed in Canadian proceedings are generally better

- Econometric rather than unit cost methods
- Itemized benchmarking results for capital costs and O&M expenses as well as total cost
- 3 Massachusetts power distributors are good cost performers in PEG's latest model
- MA Performance generally better for O&M than for capital cost

2. Forecasted ARMS

A forecasted ARM features predetermined “stairstep” rate increases [e.g., 5% in 2026, 6% in 2027, 4% in 2028] based on cost “forecasts”.

Precedents: [e.g., MN, NY, GA]

These ARMs can fund unusual cost trajectories and can be “sculpted” to reduce rate shock.

Many utilities like forecasted stairsteps, which entail capex budget preapproval

However, other parties fear high regulatory cost and information asymmetries between utilities and regulators/stakeholders

“There is a fundamental problem with budget-based ratemaking that boils down to the fact that budgets are not always implemented as planned. In addition, no party other than [Southern California Edison (SCE)] provided or analyzed detailed post-[test year] plant addition budget forecasts in determining increases. We cannot fault other parties for not recommending detailed [post-test year] capital budgets. As we have noted in past General Rate Cases, analyzing such budgets for two additional years imposes a significant burden on resources. For these reasons, we reject SCE’s proposal for budget-based cost increases.”

California Public Utilities Commission (2009), Decision 09-03-025, p. 305.

Capital cost underspends may be clawed back to customers.

Forecasted ARMs are not workable in some historical test year states.

ARM Design Options (cont'd)

3. Hybrid ARMs

Indexing O&M revenue

Capital revenue escalation based instead on:

- Multiyear capex forecast [e.g., Australia, Ontario “Custom IR”]
Capital revenue trajectory can again be sculpted.
- Average historical capex repeated [e.g., “old school” CA,
Alberta K-bar (prior plan)
MA K-bars (rolling average may include years of current plan)]
- Test year capex repeated [e.g., CA]

ARM Design Options (cont'd)

4. Bump 'n Freeze

Some ARMs provide revenue requirement “bumps” for specific capex projects but otherwise freeze base rates.

No explicit rate escalation for costs of O&M expenses or smaller plant additions

These costs unded by billing determinant growth and rate base shrinkage.

“Bumped” plant additions are often added to revenue requirement gross of the depreciation of other plant.

This approach favored in jurisdictions with:

- Historical test years
- Major plant additions
- Brisk load growth.

Precedents: AZ, CO, FL, LA, NH, OH, WV

MRPs and Massachusetts' Energy Objectives

Some form of Altreg seems warranted in MA. MRPs are the best candidate.

Best practice for ARM design is to use a multistep process.

1. What costs can just and reasonably be addressed mechanistically?

- Indexing for O&M expenses
- Budgets for some capex based on historical capex.

2. What costs require special ratemaking treatment and how special should it be?

- 1-way tracker, 2-way tracker, or no trueups to actual costs?
- Sculpt revenue requirement growth with revenue caps and/or deferral accounts

>>> Special ratemaking treatments may be needed to ensure achievement of Commonwealth energy goals but should be used sparingly because they weaken cost containment incentives and raise regulatory costs.

MRPs and Massachusetts' Energy Objectives (cont'd)

Other MRP provisions can also further state energy goals

- Revenue decoupling can encourage DSM, DERs, and time-sensitive rates.
- Metrics & PIMs can measure and incentivize progress towards objectives (e.g., peak load management, advanced metering infrastructure performance, quality of DER customer services, beneficial electrification, statistical cost benchmarking, and affordability)
- Costs of government-mandated projects and practices that advance state objectives can be tracked (e.g., DSM, Grid Modernization, and integration of DERs and EV charging stations)
- Integrated distribution system planning is already practiced in MA
- Pilot programs for innovative initiatives

Streamlined ratemaking leaves more time to address generic issues and grid planning

Conclusions

A comprehensive ratemaking framework for Massachusetts can:

- support Commonwealth energy objectives
- encourage operating efficiency and affordability
- streamline ratemaking

A well-designed MRP can accomplish these goals.

Many jurisdictions addressing major changes in electricity systems (e.g., California, Ontario and Great Britain) use MRPs for ratemaking.

Appendix



Acronyms

AMI	Advanced metering infrastructure
ARM	Attrition relief mechanism
DER	Distributed energy resources
DG	Distributed generation
DSM	Demand-side management
MFP	Multifactor productivity
MRP	Multiyear rate plan
O&M	Operation and maintenance
PBR	Performance-based ratemaking
PIM	Targeted performance incentive mechanism

Glossary of Terms

Advanced Metering Infrastructure (“AMI”): An integrated system of smart meters, communications networks, and data management systems that enables two-way communication between the electric company and customers.

Attrition Relief Mechanism (“ARM”): A key component of multiyear rate plans which uses a predetermined formula to adjust utility rates between general rate reviews without closely tracking the growth of all of the company’s *own* costs. Methods used to design ARMs include forecasts and indexation to quantifiable external cost drivers such as inflation and customer growth.

Base Rates: The components of an electric company’s rates which provide compensation for costs of non-energy inputs such as labor, materials, services, and capital.

Beneficial Electrification: Replacement of fossil-fueled equipment such as motor vehicles and space heaters with alternative equipment that is powered by electricity.

Capex: Capital expenditures.

Cost of Service Regulation (“COSR”): The traditional North American approach to ratemaking which resets base rates in irregularly timed rate cases to reflect the cost of service that regulators deem prudent.

Cost Tracker (aka Variance Account): A mechanism providing expedited recovery between rate cases of targeted costs that are deemed prudent by regulators. A tracker is an account of costs that are eligible for recovery. Costs deemed prudent can be recovered promptly with a rate surcharge (aka “rider”) or deferred as “regulatory assets” for future recovery. Tracker treatment was traditionally limited to costs that are large, volatile, and largely beyond the control of the electric company. In more recent years, trackers have been used to address rapidly rising costs and costs of underused practices. “One-way” tracker true up revenue to actual underspends. “Two-way” trackers true up revenue to overspends as well as underspends.

Demand-Side Management: Energy conservation, peak load management, and other activities intended to reduce use of a utility system.

Glossary of Terms (cont'd)

Distributed Energy Resources (“DERs”): Technologies, services, and practices that can improve efficiency or generate, manage, or store energy on the customer side of the meter. DERs include energy efficiency and demand response programs, distributed generation, energy management systems, and batteries.

Energy Transition The transition of the economy to greater reliance on electricity that is generated from clean resources. This transition is likely to entail brisk demand growth and a need for a more resilient grid.

Federal Energy Regulatory Commission (“FERC”): The federal agency responsible for regulating rates for utility services offered in interstate commerce. These services include power transmission, bulk power supply, and interstate gas pipeline transportation and storage.

Formula Rate Plan (“FRP”): A formula rate plan is designed to make a company’s revenue closely track its own cost of service. It typically entails a mechanism for truing up a utility’s revenue to the portion of its actual costs that regulators deem prudent. Formula rates are widely used by the FERC in power transmission regulation.

Multi-Year Rate Plan (“MRP”): A common approach to PBR that typically features a multiyear moratorium on general rate reviews, an attrition relief mechanism, and several PIMs. Regulatory schemes in some states are *called* MRPs but act more like formula rates due to fine-print “reconciliation mechanisms” (e.g., DC, IL, MD).

Opex: Operation and maintenance expenses.

Performance-Based Regulation (“PBR”): An approach to ratemaking designed to strengthen utility performance incentives. Some PBR approaches also streamline ratemaking.

Performance Incentive Mechanism (“PIM”): A mechanism consisting of one or more metrics, targets, and financial incentives (rewards and/or penalties) that is designed to strengthen performance incentives in a targeted area such as reliability or energy efficiency.

Glossary of Terms (cont'd)

Performance Metric System: A system of metrics used to appraise the performance of an electric company in one or more areas (e.g., reliability, environmental performance, and cost). These systems may include metrics without targets, metrics with targets, and PIMs.

Productivity: The ratio of outputs to inputs is a rough measure of operating efficiency which controls for the impact of input prices and operating scale on cost. Studies of total factor productivity trends (which consider both capital and O&M inputs) have been used in many MRP proceedings to set the X factors of indexed ARM formulas.

Rate Case: A proceeding to reset an electric company's base revenue requirement to better reflect the cost of service. These proceedings may also consider other issues such as rate designs.

Rate Case Moratorium: A set period of time without general rate cases.

Rate Rider: A mechanism, frequently outlined on tariff sheets, which allows an electric company to receive rate adjustments between rate cases.

Revenue Cap Index: A formula sometimes used for escalating allowed revenue in MRPs which typically includes an inflation index and an X factor.

Revenue Decoupling: A mechanism for relaxing the link between an electric company's revenue and use of its system, which makes periodic rate adjustments to ensure that actual revenue closely tracks allowed revenue between rate reviews. A companion revenue adjustment mechanism typically escalates allowed revenue between rate reviews for a key cost driver such as customer growth.

Revenue Requirement: The annual revenue that the electric company is entitled to collect as compensation for the cost of service. The amount is periodically recalculated in rate reviews to reflect costs and may be escalated by other mechanisms (e.g., cost trackers and ARMs) between rate reviews. The corresponding cost is typically the sum of operation and maintenance expenses, depreciation, taxes, and a return on rate base less other operating revenues.

Glossary of Terms (cont'd)

RIIO: An approach to energy utility ratemaking used by Great Britain's Office of Gas and Electricity Markets ("Ofgem") that combines revenue decoupling, targeted incentives for underused practices, multiyear rate plans, and various metrics and targeted performance incentive mechanisms. The term RIIO stands for Revenue = Incentives + Innovation + Outputs.

Targeted Incentives for Underused Practices: Direct incentives for utilities to embrace practices that they tend to underuse because they are novel, save tracked or external costs, or reduce capex. DSM is a classic example. Incentives that have been used to encourage underused practices include tracker treatment for their costs, capitalization of their costs (if O&M expenses), management fees, and pilot programs.

Test Year: A specific period in which an electric company's costs and billing determinants are considered in a rate review. Some states use a historical test year and adjust billing determinants and costs for known and measurable changes. Other states use a fully forecasted test year that considers other possible changes.

X-Factor (aka Productivity Factor): A term in an indexed ARM formula which reflects the typical impact of productivity growth on cost growth. The X factor may also incorporate a stretch factor and an adjustment for the inaccuracy of the inflation measure that is used in the ARM formula.

Suggestions for Further Reading

- Lowry, Mark Newton, Matthew Makos and Rebecca Kavan (2024). “Performance-Based Regulation: Basic Features and Possible Applications to Virginia’s Electric Utilities,” Prepared for Clean Virginia, [https://irp.cdn-website.com/cf38e6cf/files/uploaded/PBR for Virginia Electric Utilities-PEG.pdf](https://irp.cdn-website.com/cf38e6cf/files/uploaded/PBR_for_Virginia_Electric_Utillities-PEG.pdf)
- Lowry, Mark Newton, Matt Makos, and Gretchen Waschbusch (2024). “Innovative Regulatory Tools for Addressing an Increasingly Complex Energy Landscape: 2023 Update,” published by the Edison Electric Institute
- Rebane, Kaja, and Cara Goldenberg (2024). “How to Restructure Utility Incentives: The Four Pillars of Comprehensive Performance-Based Regulation,” Rocky Mountain Institute, <https://rmi.org/insight/how-to-restructure-utility-incentives-four-pillars-of-comprehensive-performance-based-regulation/>
- Lowry, Mark Newton, David Hovde, Rebecca Kavan, and Matthew Makos (2023). “Impact of Multiyear Rate Plans on Power Distributor Productivity: Evidence from Alberta,” *The Electricity Journal*, Volume 36, Issue 5, June.
- Lebel, Mark, Jessica Shipley, Steve Kihm, Mikhaila Calice, and Peter Cappers (2023). Improving Utility Performance Incentives in the United States: A Policy, Legal and Financial Framework for Utility Business Model Reform, Regulatory Assistance Project, <https://www.raponline.org/wp-content/uploads/2023/10/rap-improving-utility-performance-incentives-in-the-united-states-2023-october.pdf>
- Green Mountain Power: Multi-Year Regulation Plan 2023-2026 (October 1, 2022). <https://greenmountainpower.com/wp-content/uploads/2022/09/Multi-Year-Regulation-Plan.pdf>
- Lowry, Mark Newton, Matthew Makos, and Jeff Deason (2017). “State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities,” prepared for Lawrence Berkeley National Laboratory. https://eta-publications.lbl.gov/sites/default/files/multiyear_rate_plan_gmlc_1.4.29_final_report071217.pdf
- Lowry, Mark Newton, and Tim Woolf (2016). “Performance-Based Regulation in a High Distributed Energy Resources Future,” prepared for Lawrence Berkeley National Laboratory. https://emp.lbl.gov/sites/all/files/lbnl-1004130_0.pdf

About Dr. Lowry

- President, Pacific Economics Group Research LLC (“PEG”)
- PBR practitioner since 1989
- **Specialties:** PBR mechanism design, input price and productivity research, statistical benchmarking, testimony
- **Recent clients:** Avangrid, Clean Virginia, Consumer Coalition of Alberta, Association Québécoise des Consommateurs Industriels d’Électricité, British Columbia Utilities Commission, Duke Energy, Hawaiian Electric, Lawrence Berkeley National Lab, Ontario Energy Board, Public Service New Mexico, Puget Sound Energy
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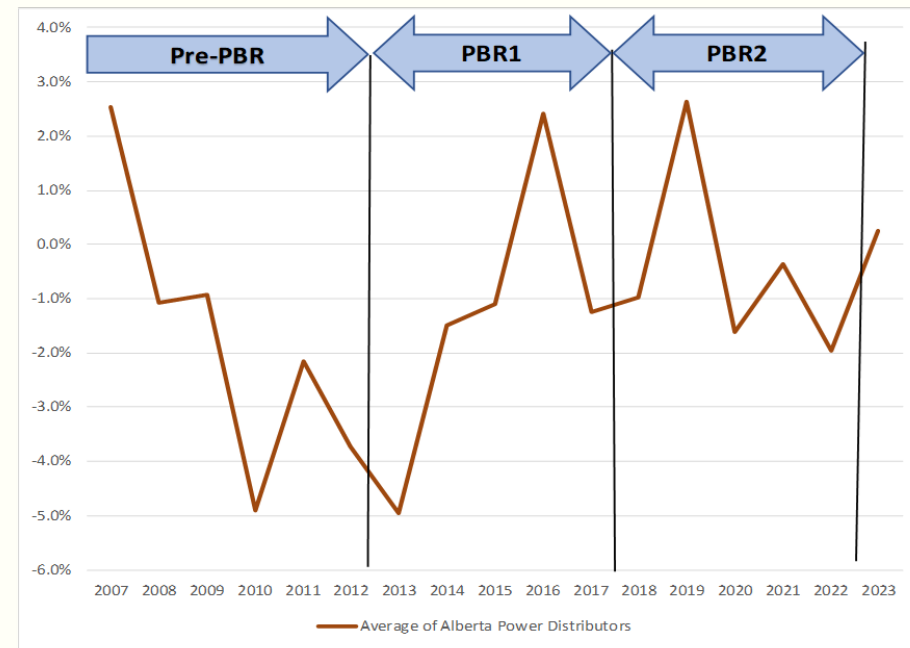
Do MRPs Improve Performance Incentives?

MRPs made mandatory for Alberta gas and electric power distributors after years of frequent rate cases

Recent PEG study found that MRPs accelerated their multifactor productivity growth after years of frequent rate cases¹

Capital productivity surged when capital cost trackers in PBR1 were replaced in PBR2 with fixed capex budgets based on each utility's historical capex.

Multifactor Productivity Growth of Alberta Power Distributors 2008-2023



¹ Lowry, Mark Newton, David Hovde, Rebecca Kavan, and Matthew Makos. "Impact of Multiyear Rate Plans on Power Distributor Productivity: Evidence from Alberta," *The Electricity Journal*, Volume 36, Issue 5, June 2023.

MRPs Abroad

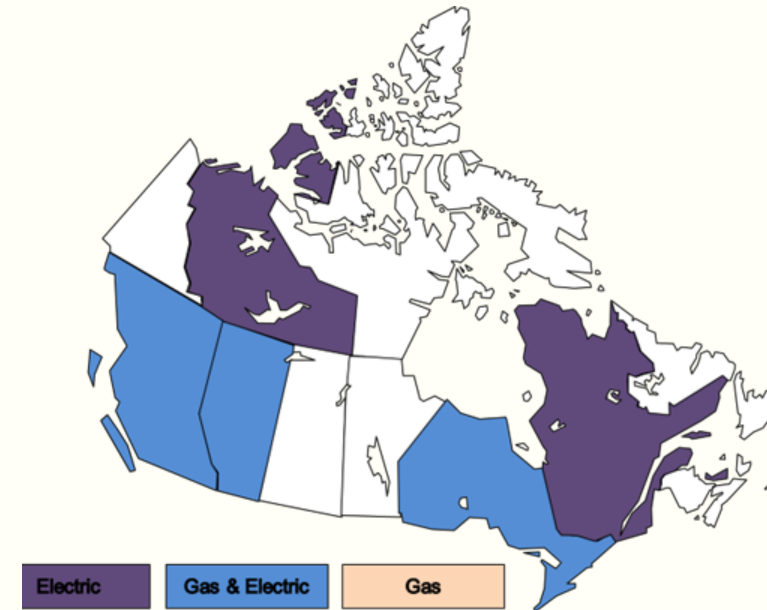
MRPs are more popular abroad (e.g., Canada, Great Britain, Australia, Latin America, and Europe).

Britain's RIIO approach to MRP design is best known.

Alberta and Ontario are world-class MRP practitioners.

Impetus for MRPs abroad often comes from policymakers or regulators.

Alberta energy distributors have twice taken regulator to court

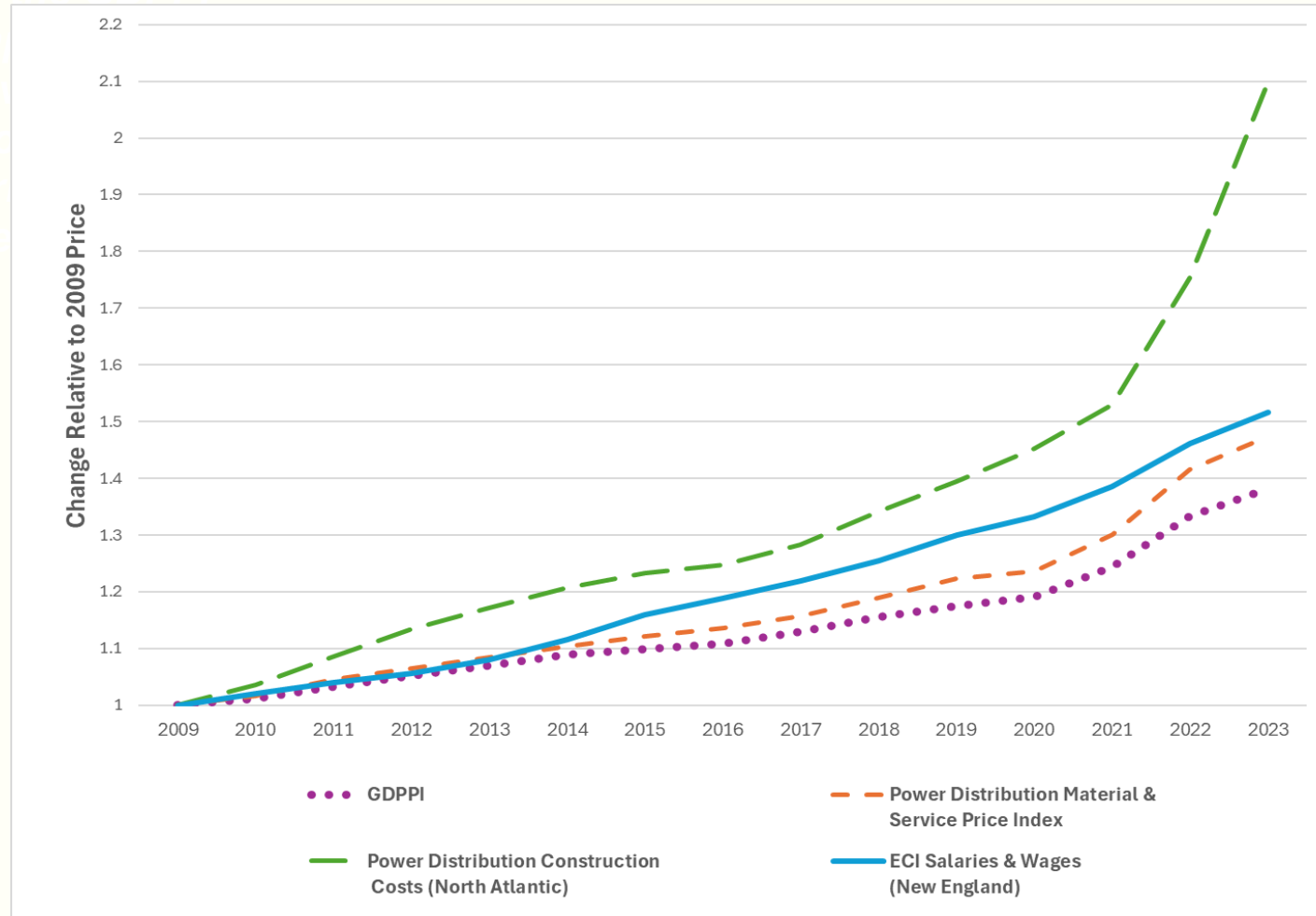


"This initiative proceeds from the assumption that rate-base rate of return regulation offers few incentives to improve efficiency, and produces incentives for regulated companies to maximize costs and inefficiently allocate resources... Regulators ... must critically analyze in detail management judgments and decisions that, in competitive markets and under other forms of regulation, are made in response to market signals and economic incentives. The role of the regulator in this environment is limited to second guessing... The Commission is seeking a better way to carry out its mandate so that the legitimate expectations of the regulated utilities and of customers are respected."

Alberta Utilities Commission, "AUC letter of February 26, 2010," pages 1-2, Exhibit 1.01 in Proceeding 566.

How Macroeconomic Inflation Measures Compare to Relevant Measures of Northeast Power Distributor Input Price Inflation

How
Cost
Rise
of N
Dist
Pric



Targeted Incentives for Underused Practices

Popular Approaches

Track their costs (e.g., DSM expenses)

Amortize cost of underused operation and maintenance (“O&M”) inputs

- Some utilities (e.g., BC Hydro) have capitalized DSM expenses
- British regulator capitalizes share of total expenditures (“totex”)

Other management fees (e.g., % of cost)

Pilot programs for underused practices

Formula Rates

What Are They?

Revenue adjusted annually to reflect utility's cost of service without general rate cases

>>> “cost of service formula” is essentially a broad-scope cost tracker

In retail ratemaking, rates typically adjusted if rate of return on equity (“ROE”) differs from target

Scope of prudence reviews sometimes narrowed

“Bells & whistles” sometimes added to strengthen formula rate incentives

- Deadband around ROE target
- $\text{growth Revenue}^{O\&M} < \text{Growth Inflation} + 0.5\%$

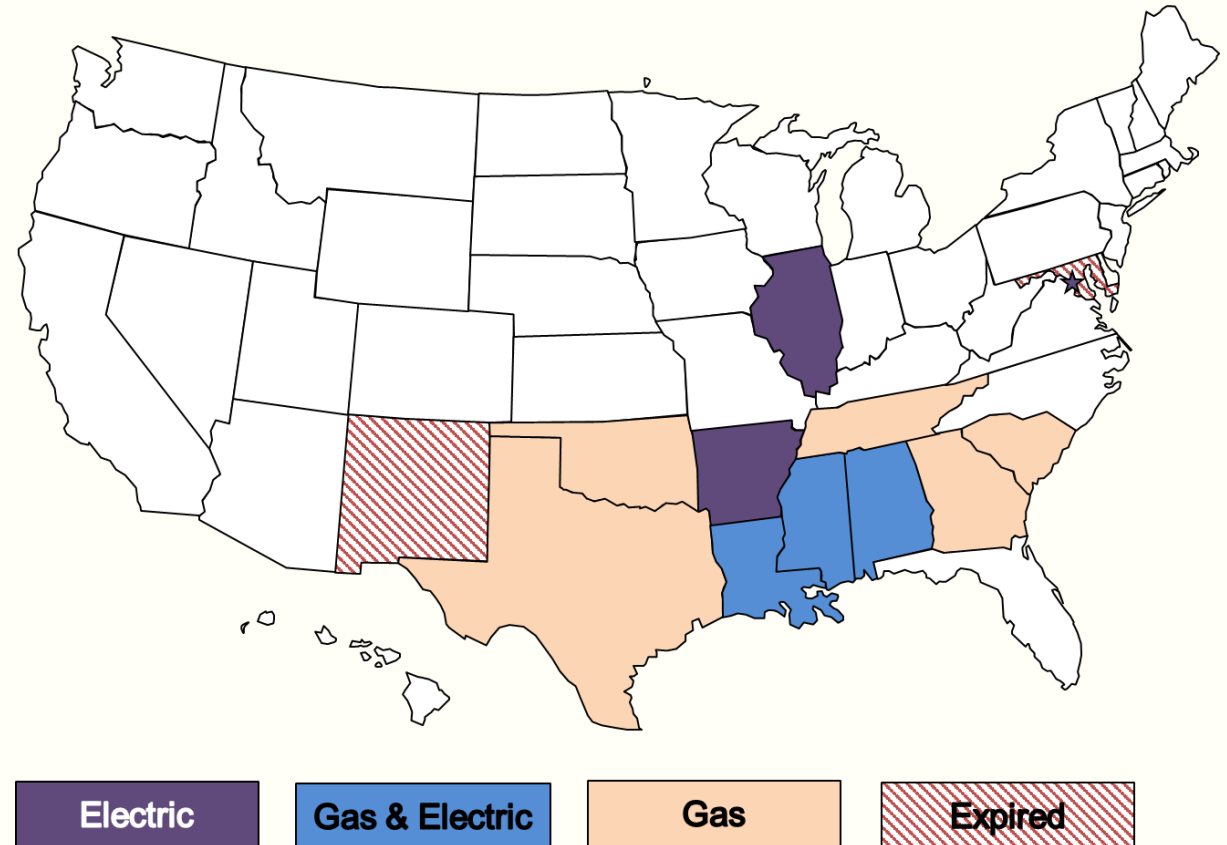
Formula Rate Precedents

Formula rates are the norm for power transmission at Federal Energy Regulatory Commission

Popular for *retail* electric and (especially) gas ratemaking in the Southeast

Alabama was early adopter

Exelon has championed formula rates in Illinois and Mid-Atlantic region



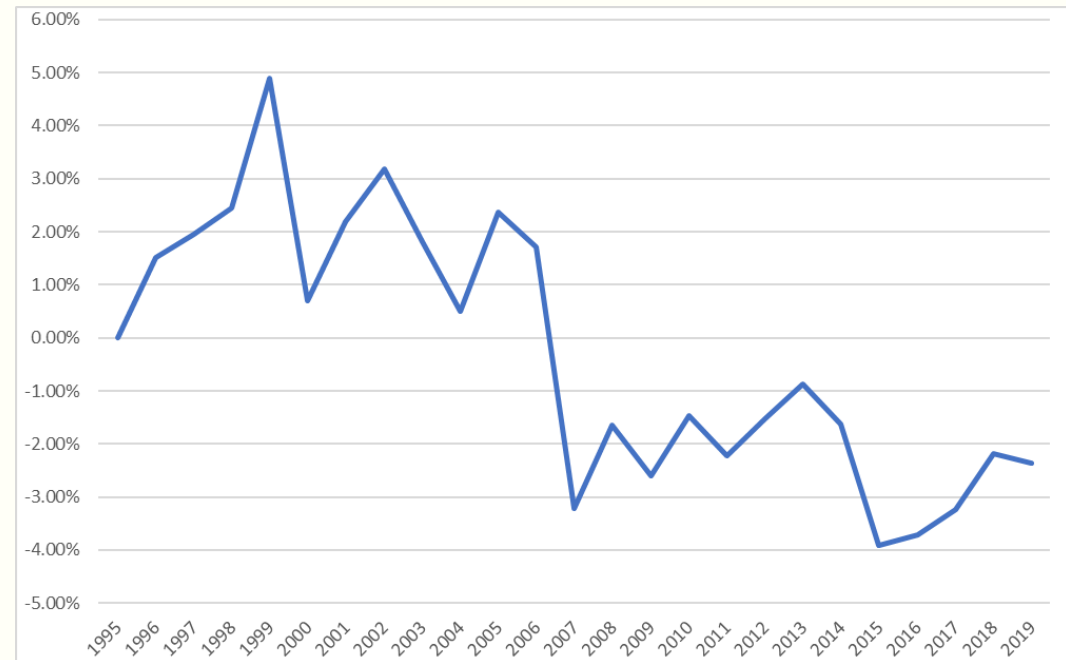
Note: Shaded jurisdictions reflect regulatory approval of formula rate plans for one or more utilities in their jurisdiction.

Formula Rates (cont'd)

Average Annual Productivity Growth of US Power Transmitters

	O&M	Capital	Multifactor TFP
2005-2019 (15 Years)	-0.79%	-1.81%	-1.77%

Multifactor Productivity Growth of US Power Transmitters has Declined Under Formula Rates



Source: PEG research for Ontario Energy Board in case EB-2021-0110

Econometric Model of Total Power Distributor Cost¹

VARIABLE KEY

N = Number of Customers
 D = 10-Year Rolling Avg of Distribution Peak
 N*N = Number of Customers squared
 D*D = Distribution Peak squared
 N*D = Number of Customers squared
 AREACU = Area Congested Urban
 AREAOTHER = Area Not Congested Urban
 PCTOHL = % of Line Plant OH
 PCTELEC = Percent Electric Customers
 PCTAMI = Percent AMI
 PCTODXG = Percent Distribution O&M of Transmission,
 Distribution, and Generation O&M
 FOR = Percent Forestation in Service Territory
 DXWORK = % Distribution Lines Over 50 kV
 TREND = Time Trend

EXPLANATORY VARIABLE	PARAMETER ESTIMATE	T-STATISTIC	P-VALUE
N	0.419***	51.034	0.000
D	0.548***	65.758	0.000
N*N	0.342***	6.729	0.000
D*D	0.735***	16.847	0.000
N*D	-0.528***	-11.319	0.000
AREACU	0.0267***	9.325	0.000
AREAOTHER	0.0418***	21.417	0.000
PCTOHL	-0.0854**	-2.768	0.006
PCTELEC	0.117***	5.683	0.000
PCTAMI	0.0151***	10.024	0.000
PCTODXG	0.0361***	5.841	0.000
FOR	0.0507***	28.188	0.000
DXWORK	0.177***	7.874	0.000
TREND	-0.00624**	-2.591	0.010
CONSTANT	12.84***	330.292	0.000
Adjusted R ²		0.974	
Sample Period		2007-2021	
Number of Observations		1,143	

¹Lowry, Mark N., "Statistical Cost Research for THESL's New CIR Plan," OEB proceeding EB-2023-0195, Filed May 6, 2024.



CURRENT
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Multi-Year Rate Plan + Performance-Based Regulation Approaches

Massachusetts Rate Taskforce
September 29, 2025



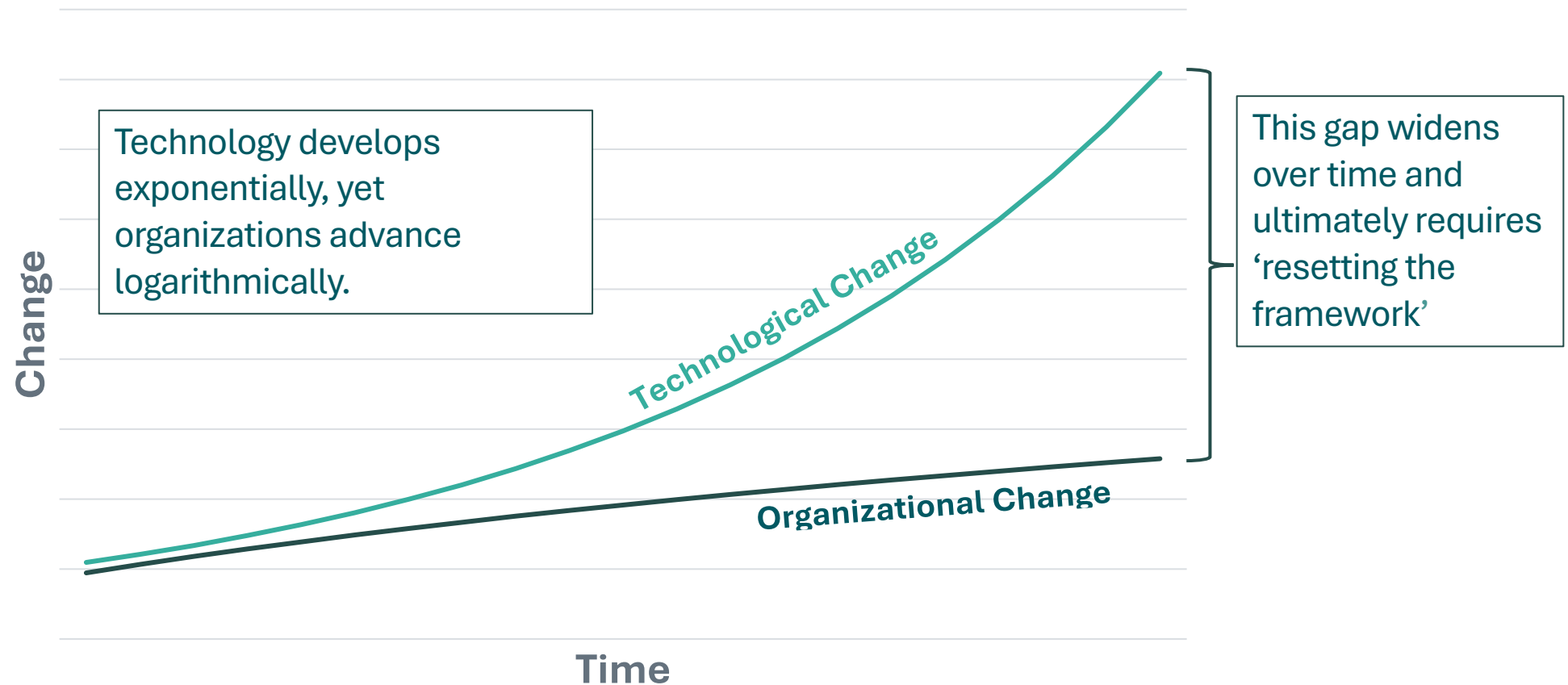
Why Performance-Based Regulation (PBR)?





Regulatory Innovation Imperative

Martec's Law and the Electricity System

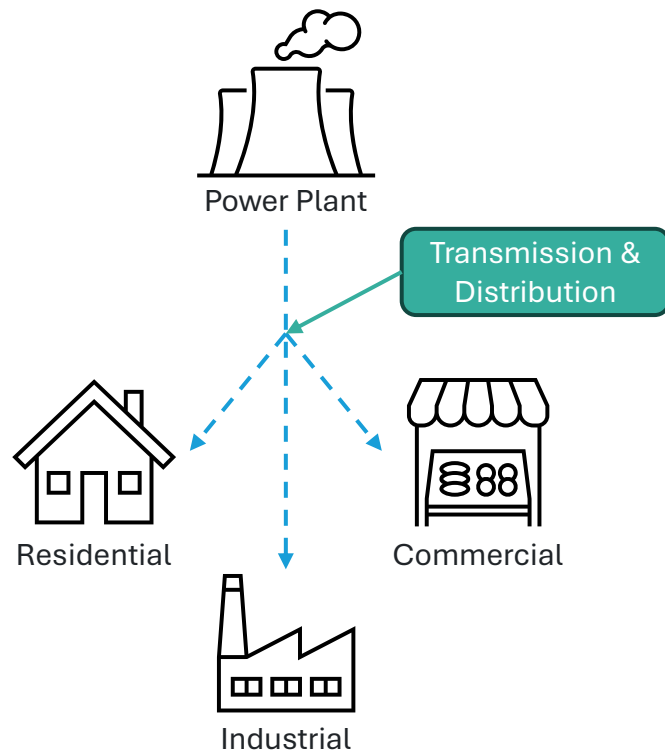


Power Grids are evolving, their regulation must evolve as well



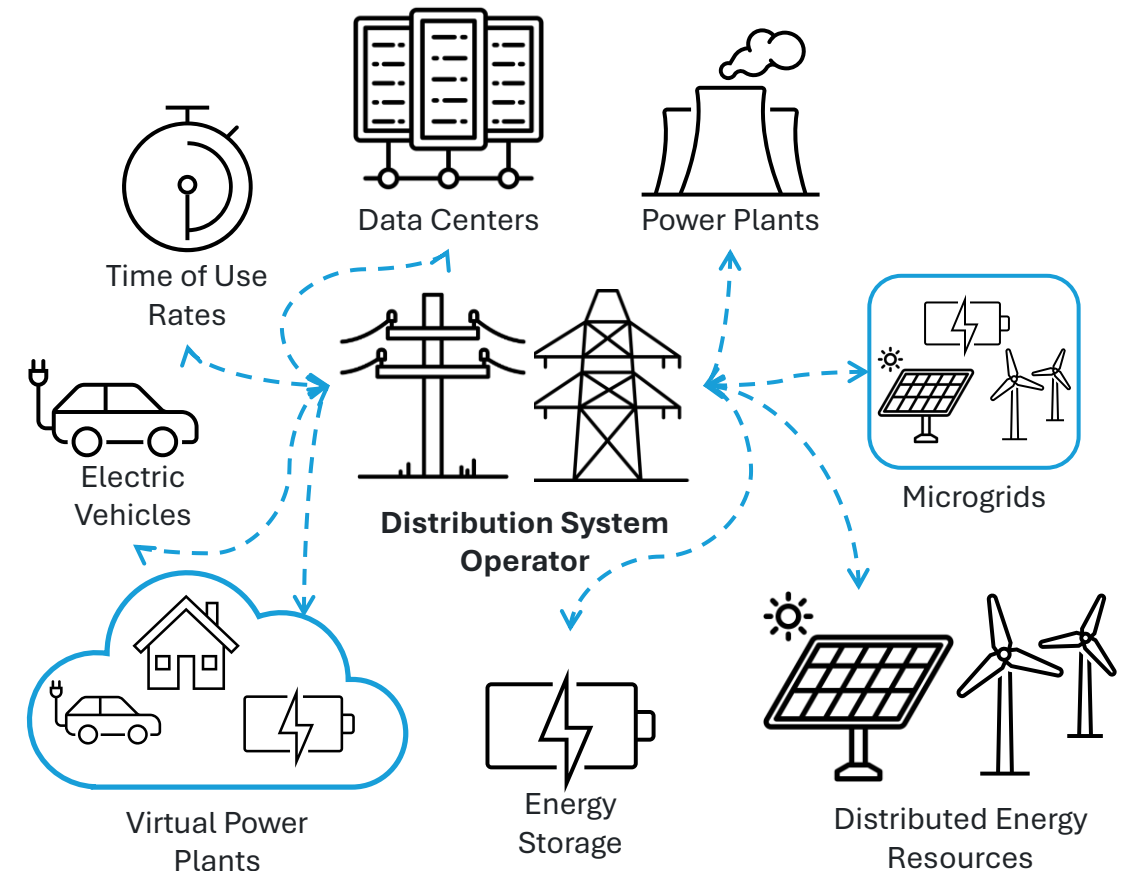
PAST: Traditional Power Grid

Central, One-Way Power System



PRESENT: The Platform Utility Model

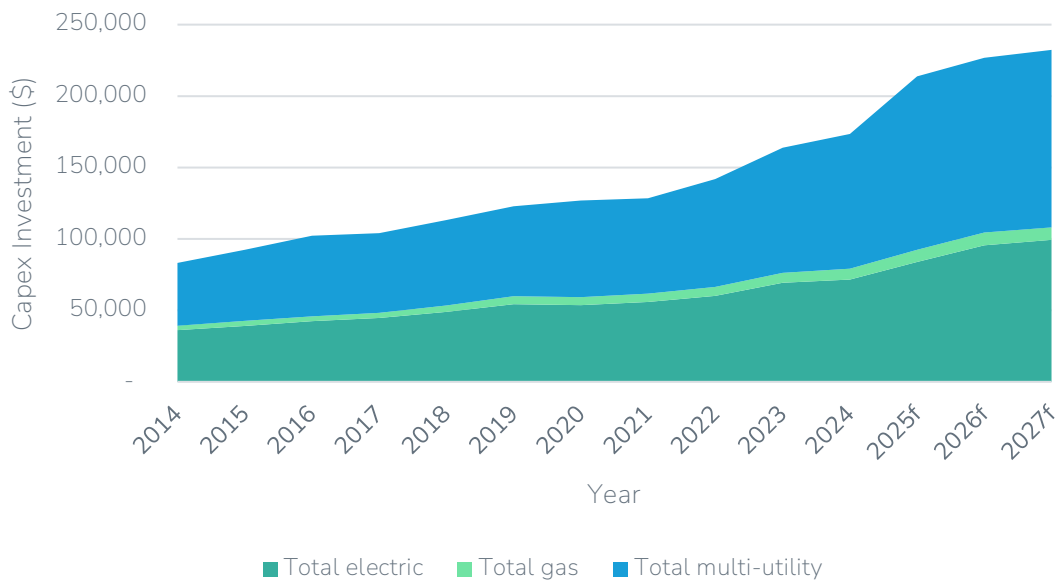
Distributed, Cleaner, Two-Way Power Flows





Capex Costs are rising across US Utilities

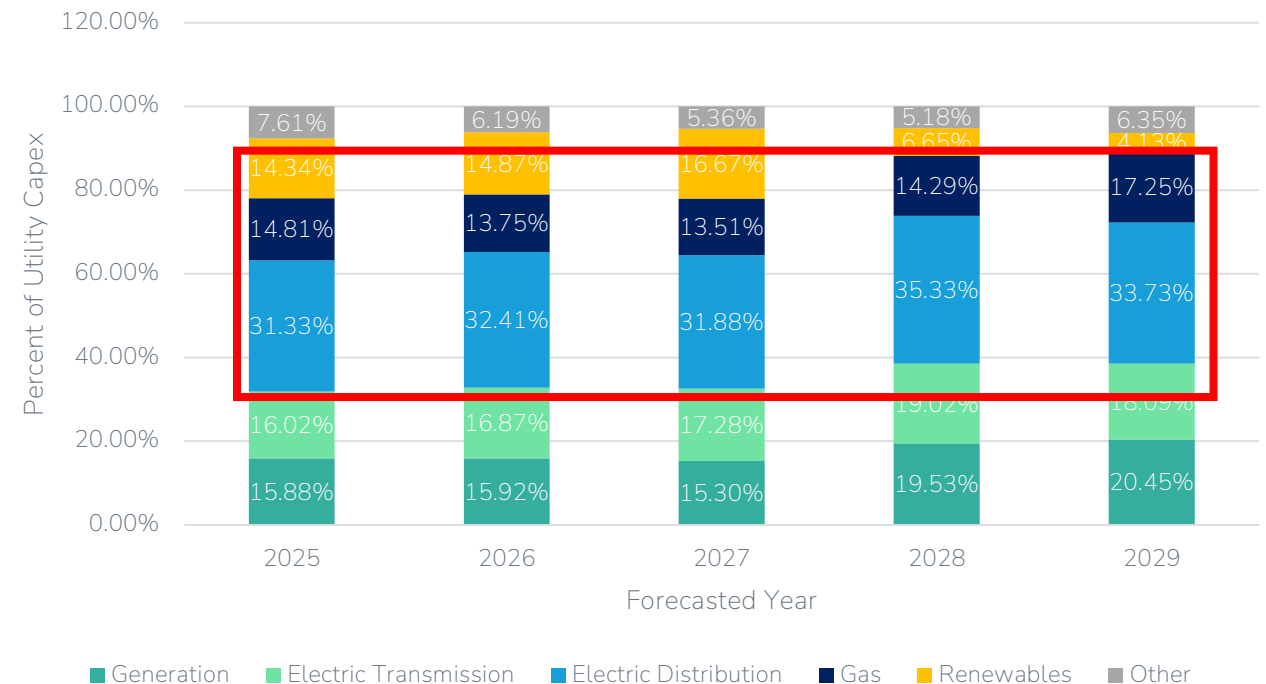
Historical and Forecasted Energy Utility Capex



Utility Capex is projected to increase beyond historical trends to meet growing energy transition and data center needs

Electric and Gas Distribution are 47.66% of forecasted Capex investment

Forecasted Capex Investment - By Segment



PBR Mechanisms



Core PBR Mechanisms



Category	Description	Mechanism	Benefits
Revenue Adjustment Mechanisms	Refocus utility revenue setting, collection, and adjustments to promote cost control and utility performance	Revenue Decoupling	Reduces utility incentives to grow energy sales, which supports energy efficiency and third-party generation
		Multiyear Rate Plans	Enhances cost control and lowers regulatory burden
		Formula Rates	Ensures an authorized return on approved investments
		Earnings Sharing Mechanisms	Balances safeguards for utility financial integrity and customer affordability
Performance Mechanisms	Incentivize performance targets aligned with policy and customer priorities	Reported Metrics	Monitors regulatory mechanism performance to inform further development
		Scorecards	Encourages achievement of regulatory goals with clear targets
		Performance Incentive Mechanisms	Provides financial incentives for utilities to meet performance goals
Additional Regulatory Mechanisms	Enable utilities to earn revenue from third-party solutions	Shared Savings	Incentivizes utilities to pursue cost-effective solutions while protecting shareholder interests
		Regulatory Sandbox	Creates a regulatory space to test innovative products and services
		Opex/Capex Equalization	Financially rewards utilities to pursue least-cost, highest value solutions

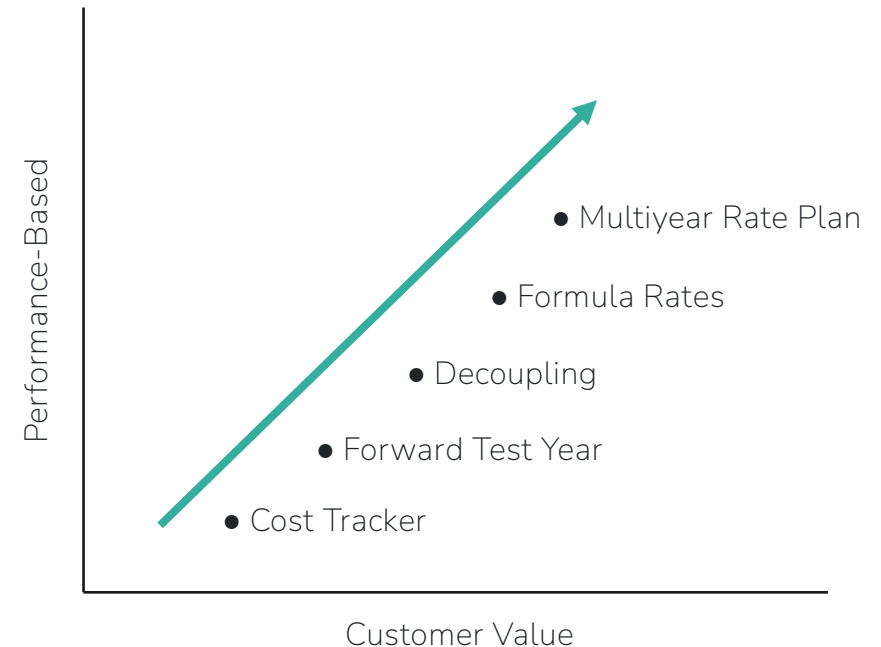


Revenue Adjustment Mechanisms

Revenue adjustment mechanisms, which are increasingly adopted in the U.S., can be used to transition a utility towards a performance-based and customer value-centric regulatory model.

Revenue adjustment mechanisms focus on how a utilities' target revenues are determined, collected and adjusted over time, and include policy tools that shift regulation away from a backward-looking focus on costs and sales to a more forward-looking approach that incentivizes cost control and rewards utility performance.

Characterization of Revenue Adjustment Mechanisms

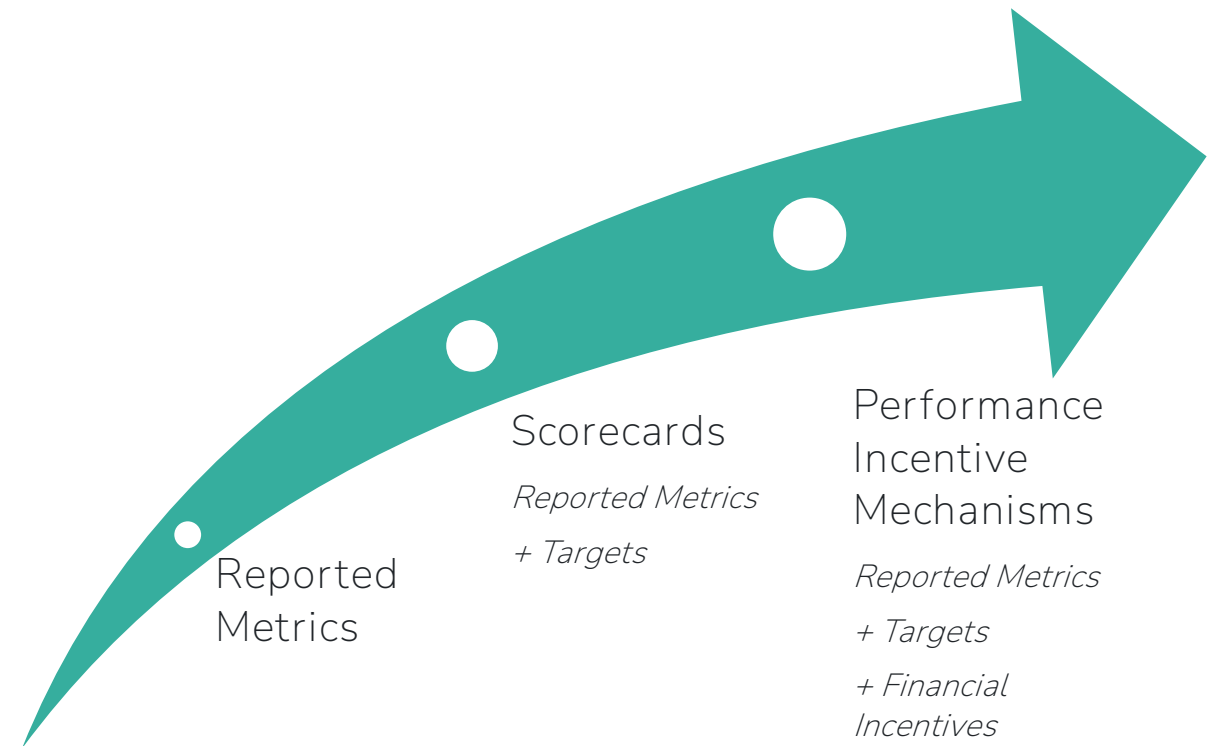




Performance Mechanisms

Performance mechanisms provide incentives for the utility to reach performance targets through the public display of metrics or benchmarking, or through financial reward for achieving certain performance.

Performance mechanisms can be used to assess diverse areas of the utility's performance, such as safety and reliability, customer satisfaction, and adoption of energy efficiency programs. The reported metrics and scorecards can also be used as building blocks for a utility, helping it to build metric tracking capabilities and gather historic and peer-compared performance trends to ultimately pursue a PIM.





Other Regulatory Mechanisms

Regulatory Sandbox: Creating Space for Innovation

WHAT ARE REGULATORY SANDBOXES?



They are a concept developed to address regulatory uncertainty



They give companies leeway from normal regulations and licensing requirements for a limited period

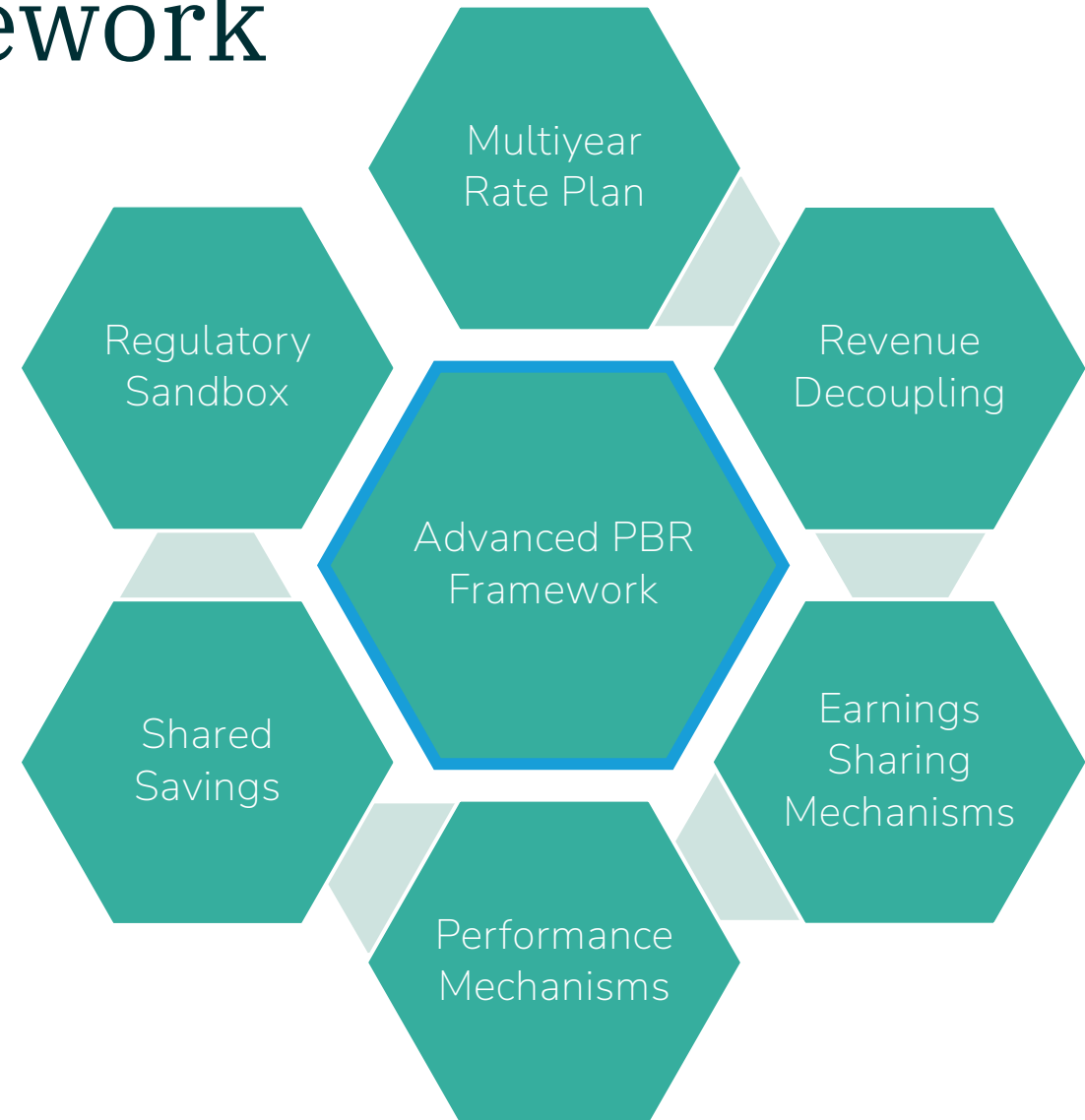


They allow new products and services to be rolled out in a limited environments as clarity is gained about regulatory implications

Connecting Elements of an Advanced PBR Framework



To create a sufficient space for innovation, enhance customer satisfaction, lower overall costs, and facilitate the transition to a platform utility model, policymakers should explore an advanced PBR framework that includes critical, core elements.



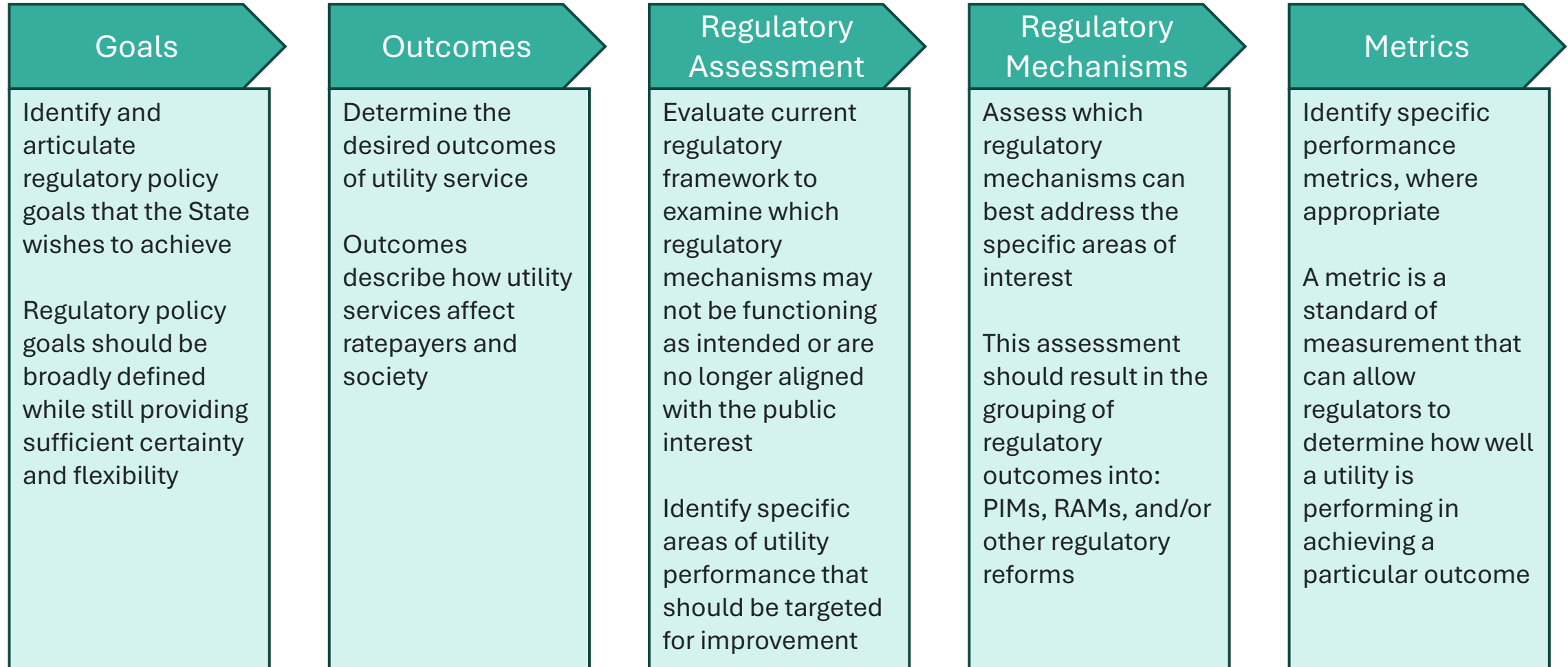
PBR Design Process

“Change is not an event, it’s a process”

-Cheryl James



Building the Foundation: Five Discrete Steps



PBR Case Studies



Hawaii

PBR Framework Design Highlights:

Externally-Indexed MRP (I-X)

Symmetrical ESM

Extraordinary Project Recovery Mechanism (EPRM). Allows recovery/adjustment for capital projects that are justified, aligned with policy goals, and subject to PUC review.

Grid Flexibility PIMs. Encourage effective DER integration through Grid Services PIM and Interconnection Approval PIM.



Connecticut*

PBR Framework Design Highlights:

Externally-Indexed MRP (I-X)

Integration with Distribution System Planning. CT-Bar - mechanism providing supplemental capital funding informed by DSP action plan.

Regulatory Sandbox. Innovative Energy Solutions (IES) Program creates space for innovation within the regulatory framework.



*As proposed

United Kingdom

PBR Framework Design Highlights:

RIO Model. Revenue = Incentives + Innovation + Outputs

Totex. Equalize capex and opex treatment to mitigate investment bias.

Output Delivery Incentives (ODI). Funding categories for strategic innovation (e.g., Network Innovation Allowance, Strategic Innovation Fund)

Flexibility Services. The framework has supported the integration of flexibility at scale.



PBR Mechanism – Jurisdiction Comparisons at a Glance



Jurisdiction	MRP	PIMs	ESM	Decoupling	Opex/Capex Equalization
Hawaii	Index	Yes	Symmetrical	Yes	Yes
Connecticut	Index	Yes	Upside-only	Yes	Yes
United Kingdom	Fixed-Rate	Yes	Symmetrical	Yes	Yes
Alberta	Index	Metrics only	Upside-only	Yes	No
Maryland	Cost Forecast	No	Symmetrical	Yes	No
North Carolina	Cost Forecast	Yes	Upside-only	Yes	No



PBR Framework Considerations

Cost Containment

- Well-designed MRP with an externally-indexed MRP

Connect Distribution Planning with Multiyear Rate Plan

- Opportunities for DSP to inform capital funding mechanism in MRP design

Capex/Opex Equalization

- Focus mechanisms to mitigate capital preference and support investment efficiency

Support Grid Flexibility

- Targeted PIMs to support DER integration and connections



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Thank you.

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currentenergy.group

Appendix





Hawaii

PBR Mechanism	Jurisdiction Design	Summary
Multiyear Rate Plan	Five-year term with index-based formula	Includes Z-Factor and Customer Dividend
Performance Incentive Mechanisms	PIMs, Scorecards, Reported Metrics	Includes reliability, GHG reduction, and decoupling incentives
Earnings Sharing Mechanism	Symmetrical, tiered	300 bps deadband, with 50/50 and 90/10 sharing tiers between customers and utilities
Revenue Decoupling	Established pre-PBR in 2010	Supported by cost & fuel-sharing PIMs
Opex/Capex Equalization	Supported by PIMs and additional revenue mechanism	Opex and Capex cost recovery allowed for “extraordinary” projects on a case-by-case basis



Connecticut

PBR Mechanism	Jurisdiction Design	Summary
Multiyear Rate Plan	Four-year term with index-based formula	Includes a Z-Factor, Customer Dividend, and Incremental Capital Funding Mechanism
Performance Incentive Mechanisms	PIMs, Scorecards, Reported Metrics	Includes reliability, social equity, and distribution system utilization incentives
Earnings Sharing Mechanism	Upside-only, untiered	No deadband, with 50/50 sharing between customers and utilities
Revenue Decoupling	Established pre-PBR in 2023	Excludes revenues from 96+ hour power outages
Opex/Capex Equalization	Supported by Shared Savings Mechanism PIM	Will investigate Totex ratemaking in a separate docket



United Kingdom

PBR Mechanism	Jurisdiction Design	Summary
Multiyear Rate Plan	Fixed-rate tariffs, Totex (RIIO) Ratemaking	1-3 year fixed-rate tariff options for domestic customers; 5-year price controls for transmission networks
Performance Incentive Mechanisms	Integrated into RIIO Ratemaking	Sets standards, customer refunds, and incentives based on performance
Earnings Sharing Mechanism	Symmetrical, untiered	No deadband, with ~50/50 between customers and utilities
Revenue Decoupling	Integrated in Titex (RIIO) Ratemaking	Revenue is capped by Totex rate, effectively decoupling from volumes
Opex/Capex Equalization	Totex (RIIO) Ratemaking	Creates “fast” and “slow” money categories, with the latter earning a rate of return to incentivize innovation and cost control



Alberta

PBR Mechanism	Jurisdiction Design	Summary
Multiyear Rate Plan	Four-year term with index-based formula	Includes a Z-Factor and Incremental Capital Funding Mechanism
Performance Incentive Mechanisms	Reported Metrics	Metrics track costs, subdivided per customer and KM of lines/pipes
Earnings Sharing Mechanism	Upside-only, tiered	200 bps deadband, with 60/40 and 80/20 sharing tiers between customers and utilities
Revenue Decoupling	Established pre-PBR in 2023	MRP's index-based formula offers a price cap on electric utility rates
Opex/Capex Equalization	None	Capex has additional funding through the Index-based formula, Opex does not

End Notes





Sources

- Rising Capex
 - [CIQ Pro: Financial Focus: US utility capex forecast nudges higher on increased generation spending plans](#)
- Hawaii
 - [PBR Framework](#)
 - [EPRM Guidelines](#)
- Connecticut
 - [RE01 Proposed Final Decision](#)
- Maryland
 - MRP Pilots (Case No. 9618, ML 311681)
 - BGE MRP Pilot (Case No. 9645, Order No. 89678)
- United Kingdom
 - [Fixed Rate Tariffs](#)
 - [RIIO Framework](#)
 - [RIIO PIMs](#)
 - [RIIO ESM](#)
 - [RIIO Volume Drivers](#)
- Alberta
 - [3rd Gen PBR Decision](#)
- North Carolina
 - [PBR Rulemaking Overview](#)

Multi-year Rate Plans: Maryland's Experience

Massachusetts Electric Rate Task Force

September 29, 2025

Accelerated cost recovery helps drive rate increases

Maryland has in place two forms of accelerated cost recovery mechanisms

Strategic Infrastructure Development and Enhancement Plan (STRIDE) law – gas only

Enacted in 2013, covering the costs of
gas pipe replacement work

Multi-year rate plans (MRPs)

Adopted in 2020, covering all utility
costs; operate like formula rates

PSC Order No. 89678: “BGE’s MRP, in contrast, is another form of alternative ratemaking, which, like STRIDE, is based on forecasting future costs.”

MRPs put regulators in untenable position of deciding what projects a utility should undertake

Capital spending: approved and denied (in millions \$)

	Requested	Denied	Approved
Pepco MRP 1	\$899	\$224	\$675
BGE MRP 1 gas	\$1,332	\$232	\$1,100
BGE MRP 1 electric	\$1,727	\$427	\$1,300

What happens with prudence review? No one knows.

Prudence review is the cornerstone of consumer protection

- Revenue requirements are set based on proposed projects, but utility is free to do different projects
- Yet: utility project lists and costs “serve as a guide” for prudence
- After six years, not even the utilities can clearly state how prudence works under MRPs

“I still am sort of trying to understand when prudence happens, and what is the impact of prudence?”

- -- Commissioner Bonnie Suchman, Maryland MRP “Lessons Learned” proceeding (Oct. 2024)

Baltimore Gas and Electric Reconciliation Revenue Requirements

Reconciliation revenues
are additional to base
revenues and recovered
through a rider added to
base rates.

	Year 1	Year 2	Year 3*	Cumulative
Electric	\$12,607,000	\$39,582,000	\$78,938,000	\$131,089,000
Gas	\$7,275,000	\$14,511,000	\$73,338,000	\$95,241,000
Total	\$19,882,000	\$54,093,000	\$152,276,000	\$226,330,000

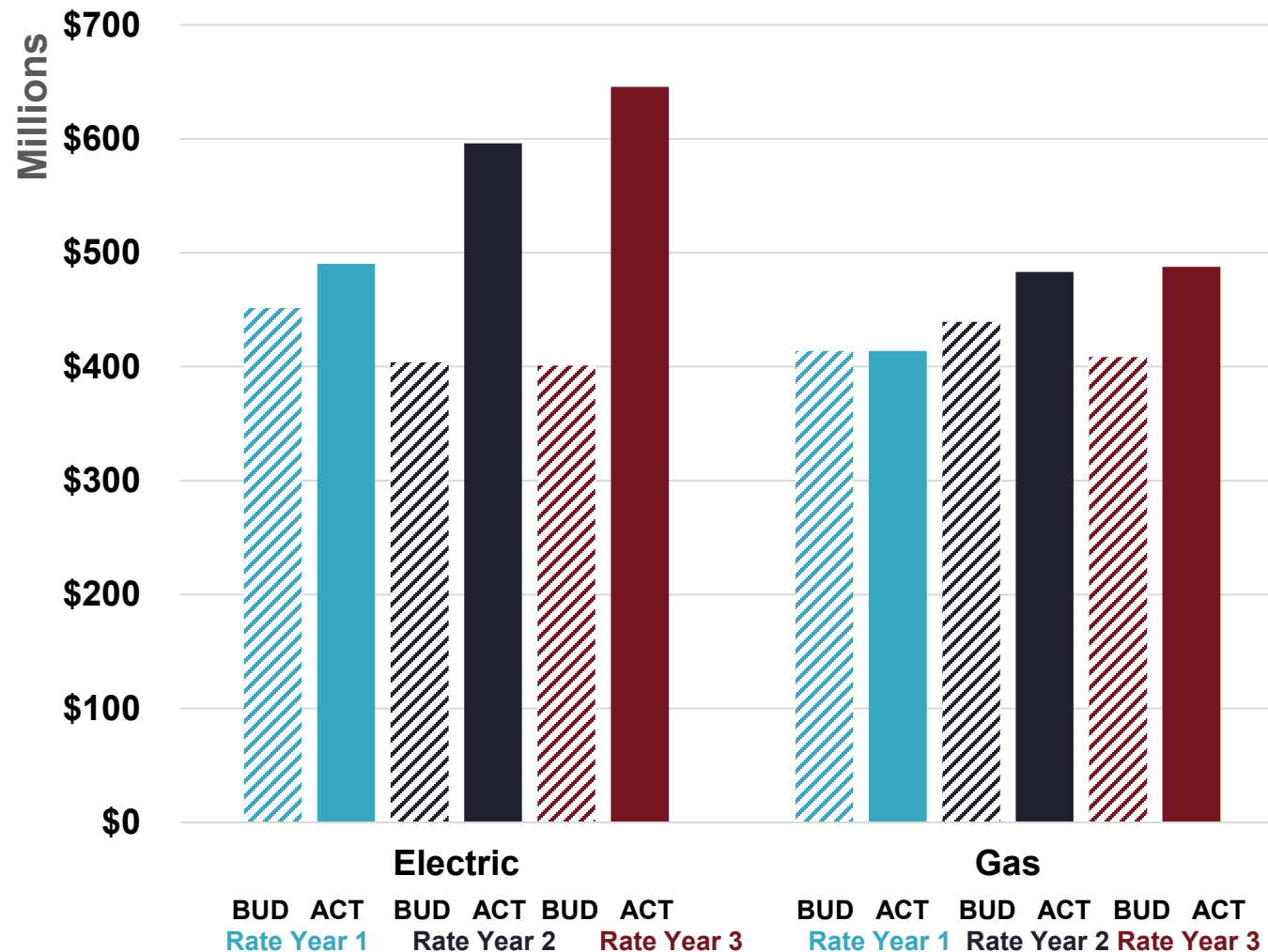
*BGE's year 3 request is still pending a Public Service Commission ruling.

MRP reconciliations, true-ups = formula rates

Totals - for 3 year MRP	millions \$
BGE initial rate increase request	\$311.5
Rate increase PSC approved in 2020	\$213.7
Total “reconciliation” or true-up request for additional rate increases	\$226.3
Total rate increase w/reconciliation	\$440.1

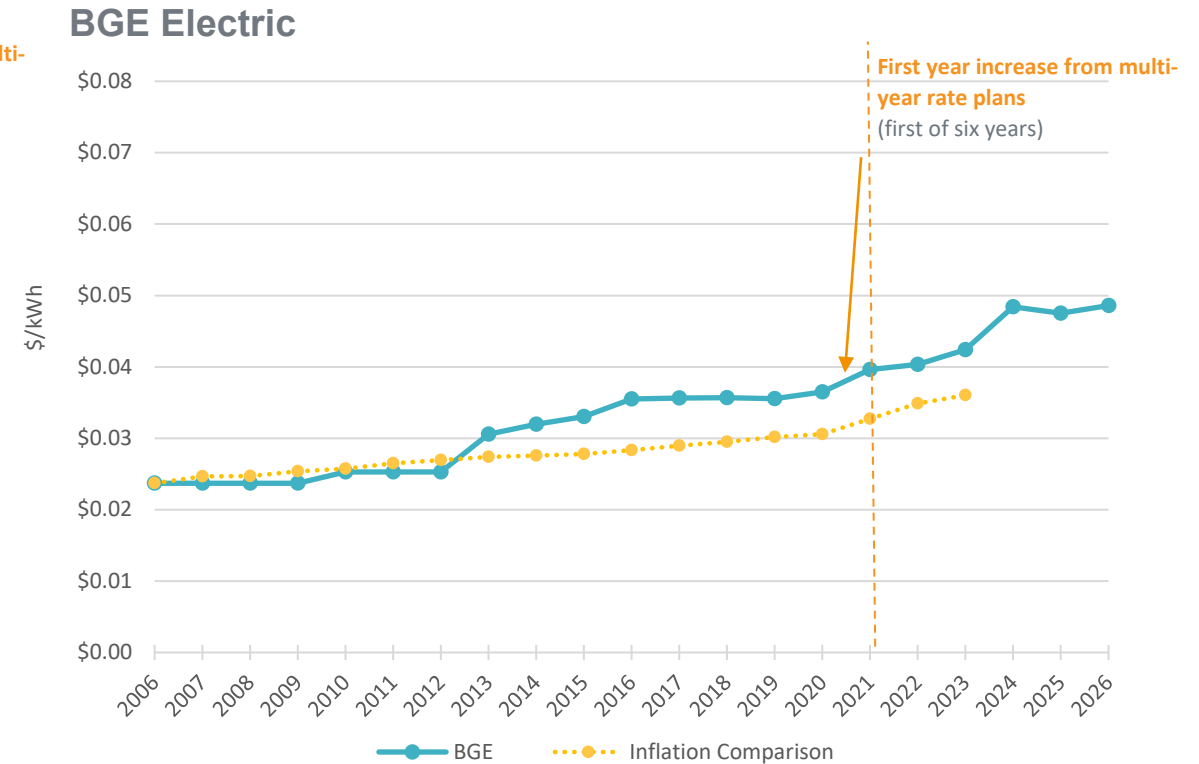
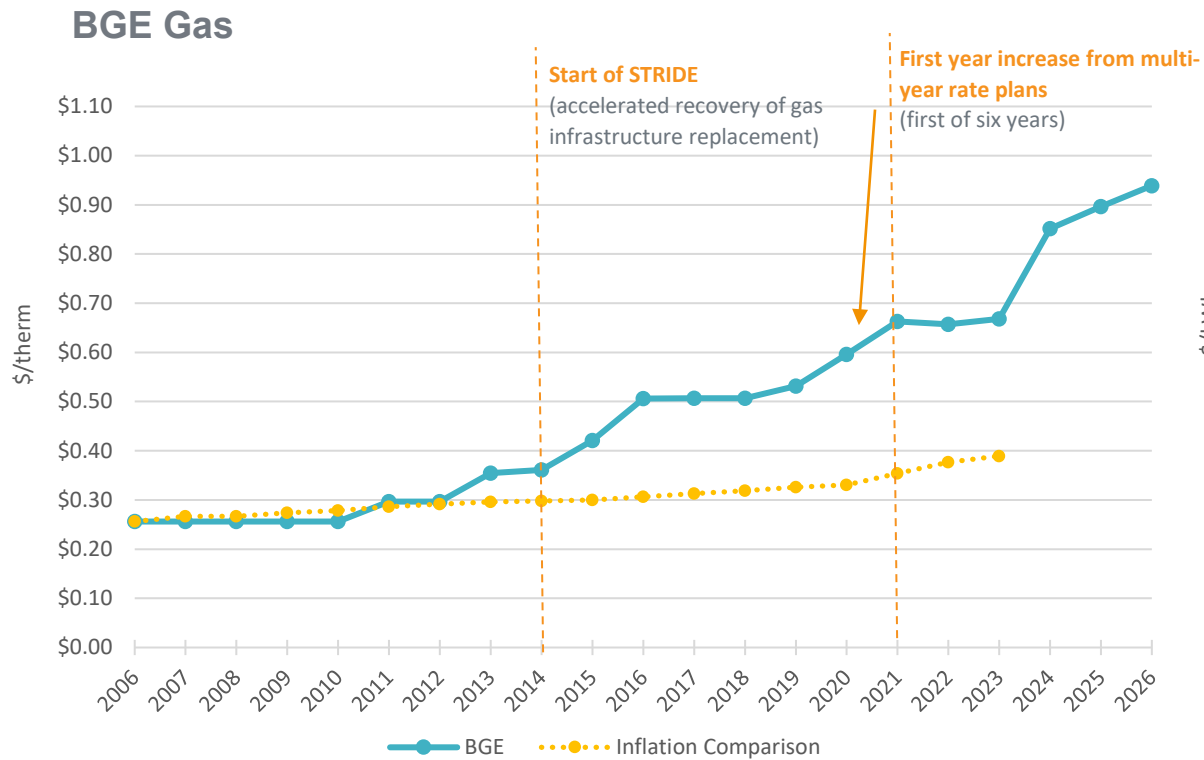
Maryland’s experience: Requests for true-ups more than double the initial MRP rate hikes

Baltimore Gas and Electric: Budgeted versus Actual Capital Spending



Accelerated cost recovery helps drive rate increases

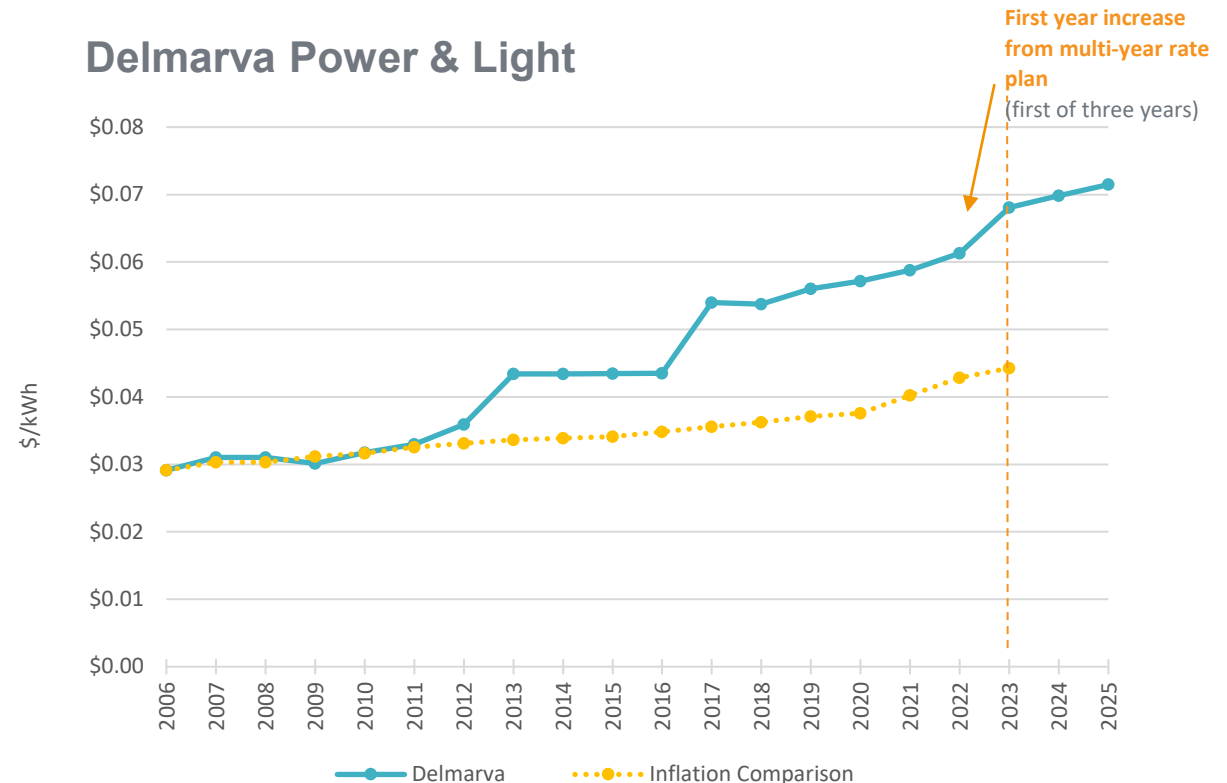
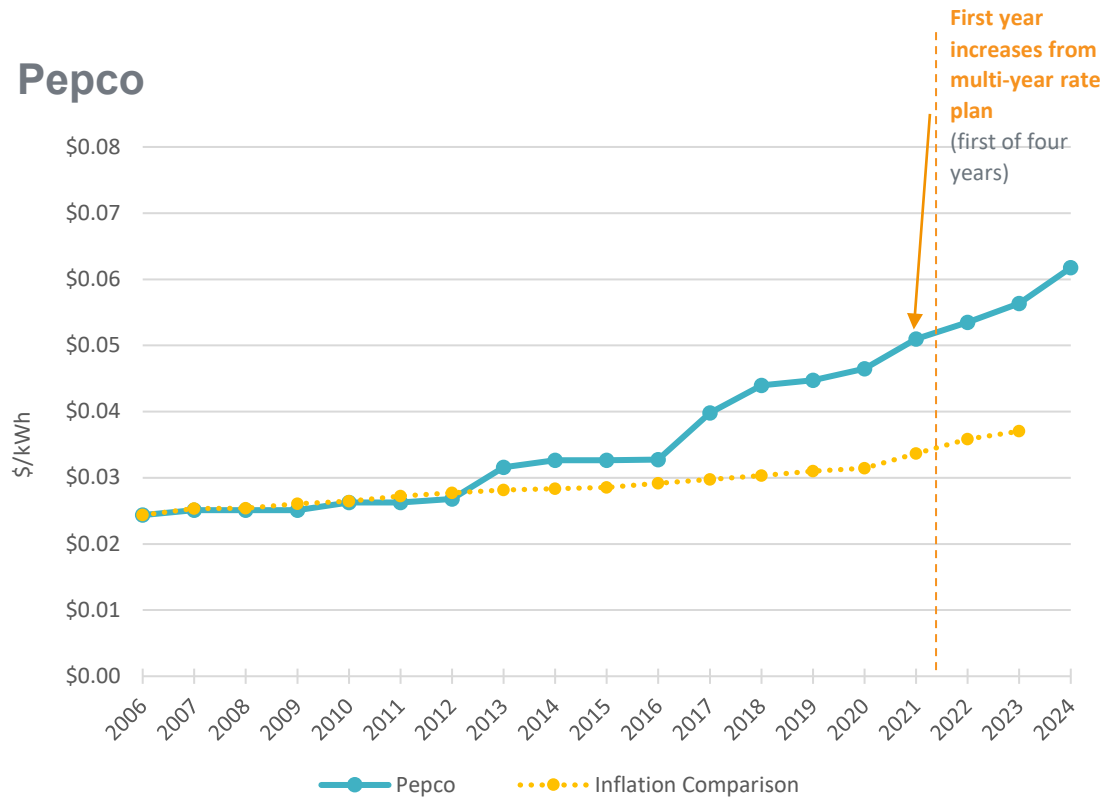
Each of the Exelon utilities' rates increased following PSC approval of their **multi-year rate plans**.



BGE's rate increases for 2021, 2022, and 2024 was reduced by the acceleration of tax credits owed customers. Without the acceleration of those credits, the rates for those years would be higher.

Accelerated cost recovery helps drive rate increases

Each of the Exelon utilities' rates increases following PSC approval of their **multi-year rate plans**.



Pepco's rate increase for the first year of its MRP was reduced by the acceleration of tax credits owed customers. Without the acceleration of those credits, the rates for that first year would be higher.

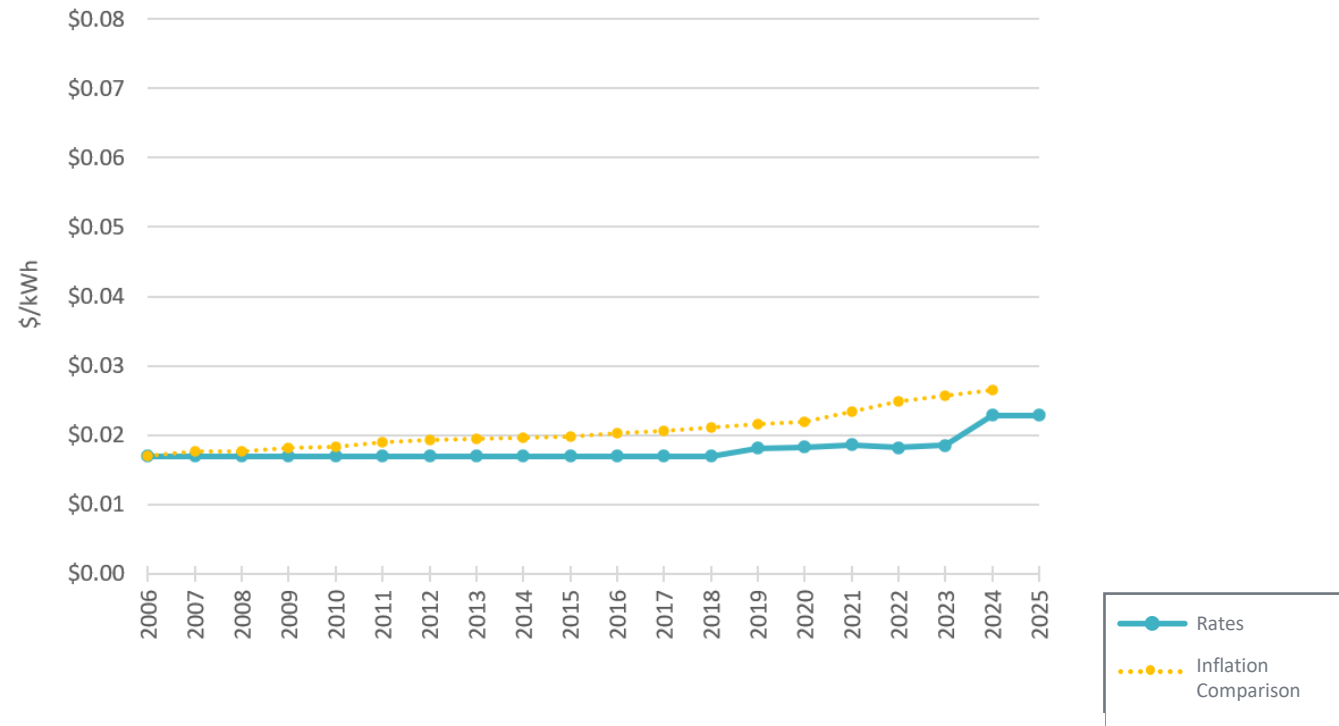
Distribution Rate Increase Highlights, 2010-2025

Maryland utilities without MRPs

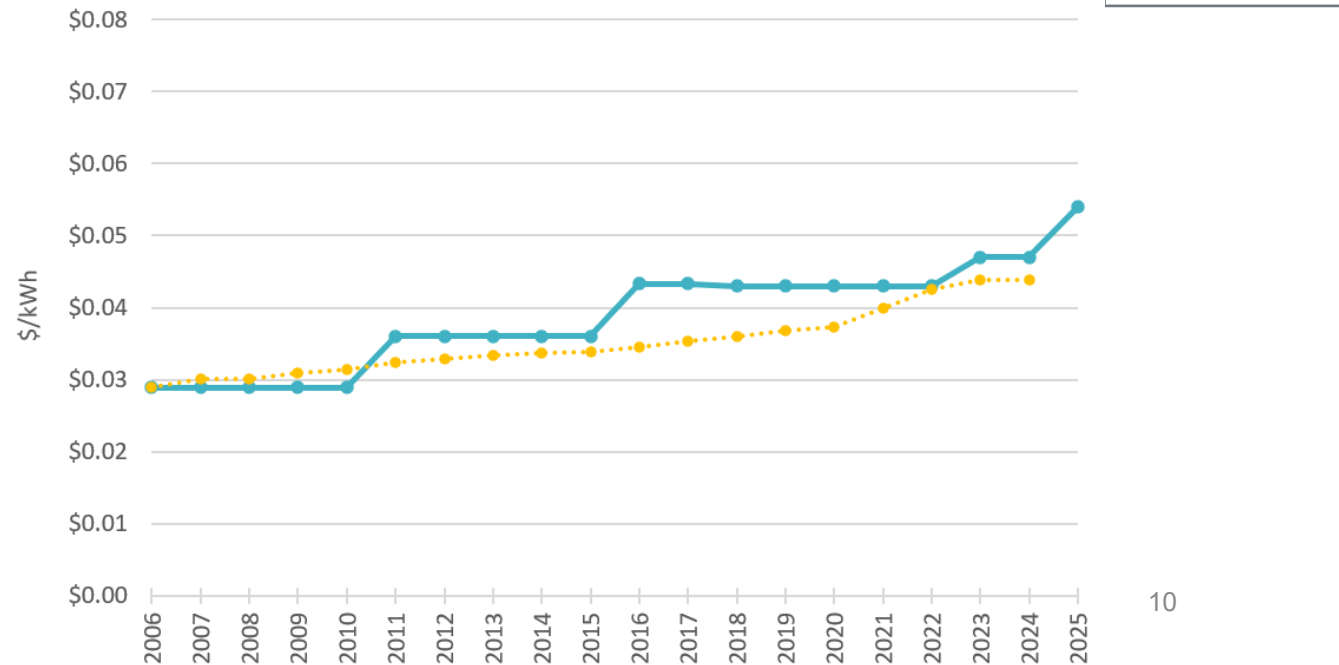
Potomac Edison's distribution rates have stayed stable and are currently substantially less than BGE, Pepco, and Delmarva Power.

Distribution rates for SMECO, a cooperative and the State's fourth largest electric utility, have increased slightly faster than the rate of inflation.

Potomac Edison



SMECO



ELECTRIC UTILITY FINDINGS

Summary comparison of current distribution rates

Utility	Fixed Monthly Charge		Distribution Rate (cents per kilowatt hour)		
	2010	2025	2010	2025	Yearly average % increase
Potomac Edison	\$5.00	\$6.00	1.7 ¢	2.3 ¢	2.1%
SMECO	\$8.60	\$9.75	2.9 ¢	5.4 ¢	4.3%
BGE (MRP)	\$7.50	\$9.65	2.5 ¢	5.0 ¢	4.9%
Delmarva Power (MRP)	\$6.00	\$9.43	3.2 ¢	7.2 ¢	5.8%
Pepco (MRP)	\$6.65	\$8.44	2.6 ¢	6.6 ¢*	6.4%

*Pepco has different rates for “summer” (June-October) and “winter” (November-May) months. The rate shown here is a weighted average of the two rates.

MRPs face significant opposition

MARYLAND MATTERS

GOV & POLITICS ENVIRONMENT HEALTH EDUCATION JUSTICE TRANSPORTATION WORK & THE ECONOMY

ENVIRONMENT GOV & POLITICS

Baltimore officials push for more action to lower energy bills

They're calling for an end to multiyear rate increases, already limited by the General Assembly this year

BY: CHRISTINE CONDON - JULY 4, 2025 12:59 AM



POLITICS State government Local government

BGE customers demand rate relief as utility bills soar: 'Shouldn't have to choose between oxygen and the heat'

Bria Overs 2/20/2025 5:08 p.m. EST, Updated 2/20/2025 9:55 p.m. EST 15 Comments



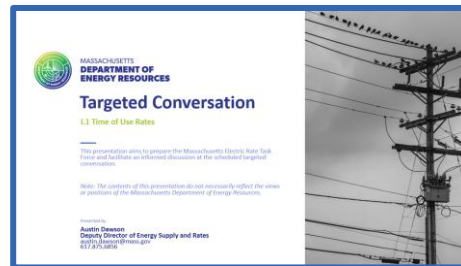
Next Steps

Targeted Conversation

October 10, 2025, 2-4pm

- Will serve as a deliberative space following related expert presentations to prompt informed discussion on policy questions and priorities

Illustrative Presentation



Optional Office Hours

October 15, 2025, 2-4pm

- Optional office hours for further conversation, serving as a structured opportunity to work towards common understandings and positions. We also encourage participants to have discussions amongst each other beside formal Task Force sessions
- Please reach out to chris.connolly2@mass.gov to request an invitation.