The Nuts and Bolts of Performance-Based Regulation:

Tools to Build a More Affordable, Reliable, and Equitable Grid

JULY 2024

PURPOSE

RMI
ENERGY. TRANSFORMED.

This guide aims to introduce the basics of performance-based regulation (PBR) for electric utilities.

It begins by explaining the need for changes to the utility business model and the goals of PBR, before moving into the advantages and disadvantages of different PBR tools, alternative regulatory mechanisms, real-world examples, and important considerations in PBR processes.

The guide is designed to support readers ranging from newcomers to PBR to those with intermediate knowledge seeking a refresher on specific concepts. Depending on where you are in your PBR journey, you might start from the beginning or skip to the section(s) relevant to your work.

FIRST, WHAT IS PBR?

Alternative Regulation (Altreg)

Altreg is an umbrella term for alternatives to the traditional regulatory model, known as cost-of-service regulation. Altreg includes PBR, but also other regulatory alternatives not focused on improving utility incentives.

Performance-Based Regulation (PBR)

PBR is a regulatory approach that seeks to align utility incentives with the interests of customers and society.

It does this by compensating utilities based on their performance against target outcomes rather than just costs — and by removing perverse incentives.

It is a collection of tools, not a single thing.

RMI

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RMI

Traditional Utility Regulation and the Need for Reform

- Utilities and Public Utilities Commissions
- The Utility Business Model
- Cost-of-Service Regulation (COSR)
- The Problems with COSR
- The Inflation Reduction Act
- Why We Still Need Utility Business Model Reform

Utilities and public utilities commissions (PUCs) play crucial roles in the clean energy transition

Utilities

Provide most of the electricity used in the United States, much of which is based on aging, fossil-fuel dependent infrastructure

In this guide, we use the term "utilities" to refer to investor-owned utilities, rather than cooperatives and municipal utilities, which have different ownership structures, regulatory frameworks, and incentives.

PUCs

- Regulate utilities through public proceedings where they gather evidence and issue regulatory decisions that utilities must comply with
- Are composed of 3–7 commissioners and staff
- Are tasked with regulating the rates utilities can charge and ensuring safe, affordable, and reliable service for customers

"PUC" is a generic term to refer to a utility regulatory agency. The actual name of this entity varies by state.

The utility business model is central to how utilities operate

A “business model” is how a company makes money.

As for-profit, investor-owned businesses, making money is a primary driver of utilities’ behavior.

Therefore, the utility business model influences decisions utilities make and the outcomes those decisions lead to.

The utility business model is influenced by regulations, state policies, and wholesale market rules (where applicable).

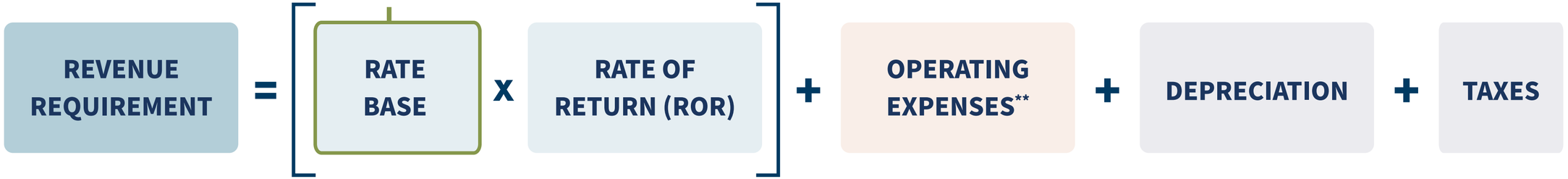
Traditionally, utilities have been compensated under a "cost-of-service" (COSR) regulatory model

Steps in the rate-setting process under traditional COSR:

1. The utility files an application to raise rates, and the PUC opens a rate case.*

2. The PUC determines the utility's revenue requirement.

Capital expenditures **(capex)** become part of the utility's rate base (by which the ROR is multiplied) and depreciated over time, while operating expenses **(opex)** are passed through to customers. This means that under COSR, capex presents an earnings opportunity for shareholders but opex does not.



3. The PUC sets customer rates to recover the revenue requirement based on expected sales.

4. When rates become insufficient to recover costs (due to inflation, customer growth, etc.), the cycle repeats.

**Since utilities operate as for-profit monopolies, the rates they charge customers are set through regulation, rather than market-based competition. This means that utilities must receive regulatory approval to raise their rates when their costs increase. When setting rates, regulators generally seek to stimulate outcomes that would naturally occur in a competitive environment, rather than provide guaranteed returns with zero risk.*

***Operations and maintenance (O&M) expense is part of operating expenses. Depreciation can also be considered an operating expense, but it is usually broken out separately in the revenue-requirement formula (as it is depicted here).*

Traditional COSR was invented to meet the policy goals of the early 20th century – but policy goals have evolved

Early 20th Century
Expand utility systems to new customers
Encourage greater energy usage
Take advantage of economies of scale by building large, utility-owned plants
Move electricity efficiently from large, centralized plants to end-use customers
Expand the use of cheap fossil fuels

Today
Operate existing systems cost-efficiently
Encourage less energy usage
Take advantage of distributed resources owned by third parties and customers
Foster innovation to adapt to technological advances and new customer expectations
Reduce the use of polluting fossil fuels

To meet 21st-century needs, utility regulation must evolve

Traditional COSR creates perverse incentives that run counter to the goal of an affordable clean energy transition

GOLD PLATING refers to the utility's incentive to overinvest in capital projects to earn a larger return, which can undermine affordability.

CAPEX BIAS creates a utility preference for capital-intensive projects (e.g., large power plants) over solutions funded through operating expenses, which may be less expensive.

Specifically, it is the O&M component of opex that the utility may be able to replace with capex.

The **THROUGHPUT INCENTIVE** motivates the utility to increase its "throughput," or energy sales, to increase its revenue. This can come at the expense of cheaper, cleaner resources like energy efficiency and distributed generation.

RESISTANCE TO THIRD-PARTY AND CUSTOMER-OWNED SOLUTIONS, driven by the utility's preference for asset ownership and the associated returns, can undermine cost-effectiveness, distributed generation and storage, and the equitable distribution of benefits.

Example: How traditional COSR undermines utility investment in cost-effective transmission alternatives like grid-enhancing technologies (GETs)* and demand-side management (DSM)**

GOLD PLATING encourages utilities to overspend on traditional transmission rather than on GETs (which are generally much cheaper).

The **THROUGHPUT INCENTIVE** discourages utilities from supporting resources like DSM that could decrease their energy sales (and thus revenues).

Less investment in cost-effective alternatives and higher customer bills!

CAPEX BIAS leads utilities to invest in capital-intensive projects (which they can earn a return on) instead of DSM (which, as opex, do not generate profits for the utility).

Due to their **RESISTANCE TO THIRD-PARTY AND CUSTOMER-OWNED SOLUTIONS**, utilities are unlikely to support GETs or DSM investments that they do not own or directly control.

** GETs are hardware and software solutions deployed within the existing transmission system, helping increase the capacity, flexibility, and efficiency of the grid.*
*** DSM consists of programs such as energy efficiency and demand response that aim to modify customer usage patterns to manage costs, balance energy supply with demand, and improve customer service.*

The Inflation Reduction Act (IRA) makes it easier than ever for utilities to invest in clean resources

Before the IRA	With the IRA
Utilities with significant coal ownership could only cost-efficiently deploy limited amounts of solar each year	**Tax transferability** allows utilities to transfer unused tax benefits to third parties to access additional financing for solar
Utility-owned solar + storage was far more expensive for customers than third-party-owned solar + storage	**The production tax credit for solar** makes utility-owned solar significantly more cost-competitive
Distributed solar was generally out of reach for lower-income households and renters	**The Solar for All program** will extend the reach of low-income solar programs
Burdensome capital costs wouldn't go away with clean deployment	**The Energy Infrastructure Reinvestment (EIR) program** helps utilities finance fossil plant retirement while investing in communities
Insufficient transmission capacity challenged new renewable development	**The EIR program** can provide financing for reconductoring transmission lines to expand their capacity

PBR and other regulatory reforms can encourage utilities to take advantage of the IRA, so customers receive the benefits the law was meant to deliver

The IRA is a collection of “carrots” (i.e., rewards), rather than “sticks” (i.e., penalties).

While the IRA supports accelerated renewables deployment and fossil plant retirement, the expected emissions reductions will not occur unless utilities pick up the “carrots.”

Utilities’ antiquated business models do not sufficiently encourage utilities to focus on delivering these benefits for their customers.

PBR can create new incentives for utilities to minimize costs and invest in transmission and customer resources to support energy affordability, reliability, and social equity.

Example: How PBR can support utility investment in cost-effective transmission alternatives like GETs and DSM

By introducing cost-control incentives, PBR can incent utilities to adopt more cost-effective solutions, such as GETs and DSM.

(see Multi-Year Rate Plans slides in the next section)

PBR can include mechanisms that tie a portion of utilities' revenue to their performance on desired outcomes. Such mechanisms can be designed to incentivize investment in DSM specifically.

(see Performance Incentive Mechanisms slides in the next section)

More investment in cost-effective alternatives and lower customer bills!

PBR can be designed to mitigate capex bias and encourage utilities to take advantage of cost-effective opex solutions, including GETs and DSM.

(see Capex-Opex Equalization slides in the next section)

PBR can include requirements that utilities track and report on their performance against specific outcomes, such as investments in DSM.

(see Performance Metrics & Scorecards slides in the next section)

PBR Tools

- Revenue Decoupling
- Multi-Year Rate Plans
- Capex-Opex Equalization
- Performance Metrics & Scorecards
- Performance Incentive Mechanisms
- Benchmarking
- Opportunities & Challenges

Revenue decoupling removes the throughput incentive and improves revenue stability

WHAT IS IT?

Revenue decoupling delinks revenues from sales.

When we use this term, we specifically mean a **revenue decoupling mechanism (RDM)**.
An RDM involves three steps:

1. Determine the allowed revenue.

2. Compare it to the actual revenue collected from customers.

3. Make an adjustment to “true up” the difference.

KEY BENEFITS

- Removes the throughput incentive
- Increases utility revenue stability
- Increases confidence in sales forecasts
- Excess revenues are returned to customers between rate cases

KEY DRAWBACK

- Reduces the earnings opportunities associated with beneficial electrification, which could mean additional tools (e.g., performance incentive mechanisms) may be needed to motivate the utility

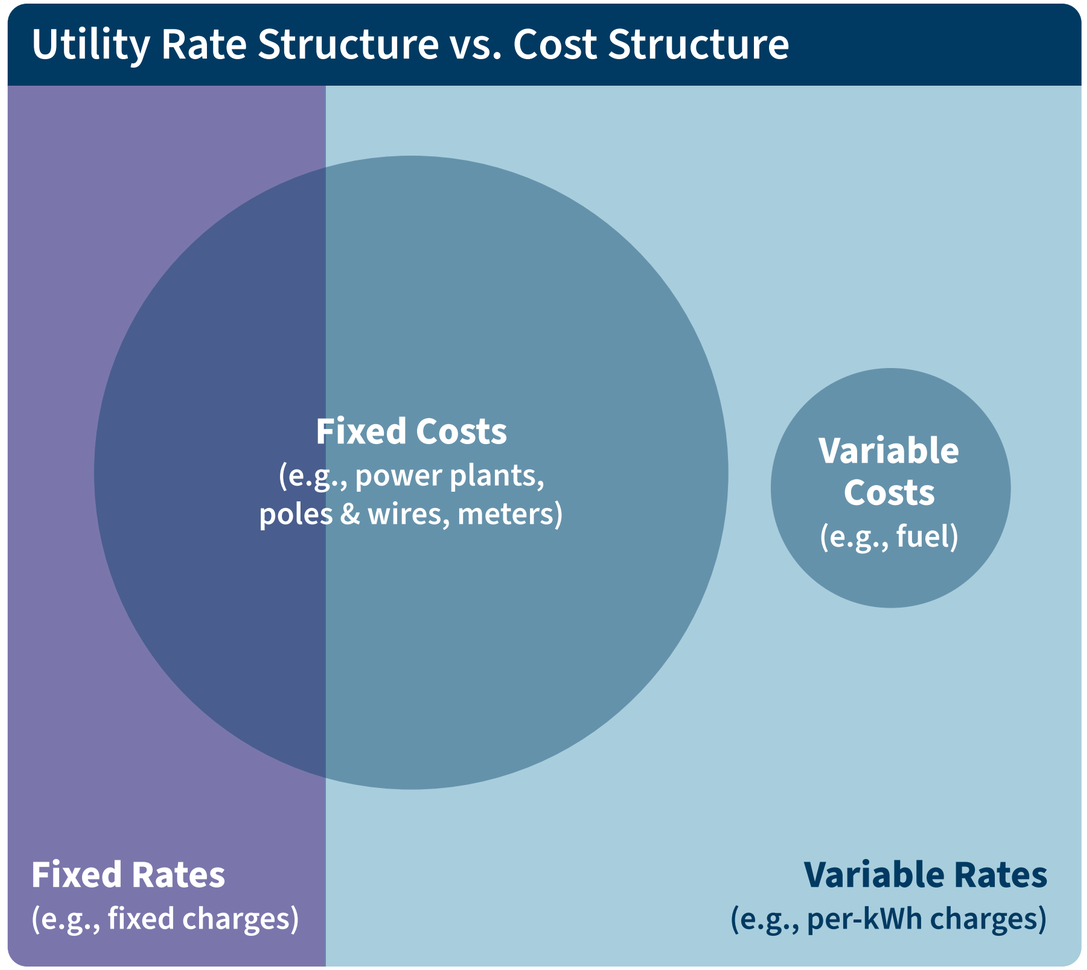
Revenue decoupling ensures that the utility recovers its approved costs – no more, no less

The need for revenue decoupling arises because a utility's rate structure typically does not match its cost structure.

- Most utility costs are **fixed in the short term** (i.e., they don't change as more electricity is sold).
- However, most revenues are collected through **variable rates**.
- This is a good thing because it encourages customers to conserve energy and install distributed generation.
- However, it also means the utility will collect more revenues than needed to recover its approved fixed costs if actual energy sales are greater than expected, and less if sales are lower than expected.

This mismatch between the rate structure and the cost structure creates the throughput incentive.

- Since the utility's fixed costs don't change in the short run, selling more energy generates more revenues to "recover" these costs without a corresponding increase in the costs themselves.
- This means the utility can increase its profits by increasing sales.



So revenue decoupling is all about fixed-cost recovery!

An RDM addresses the throughput incentive by truing up the utility's actual revenues to its approved revenues.

Though this may be described as truing up "all" actual revenues to "all" approved revenues, it's really just the fixed-cost part that gets trued up.

- In general, all approved **variable costs** are automatically recovered through variable rates, leaving nothing for revenue decoupling to true up later.
- As a result, revenue decoupling really just trues up the revenues collected to recover the utility's **fixed costs** to their approved level.

Why does this matter?

- Sometimes people think revenue decoupling "compensates" the utility for the cost of power it doesn't deliver — but this is **not true**.
- If the utility doesn't deliver a kWh of power (e.g., because of an outage), the customer won't be billed for the variable cost of producing that kWh.

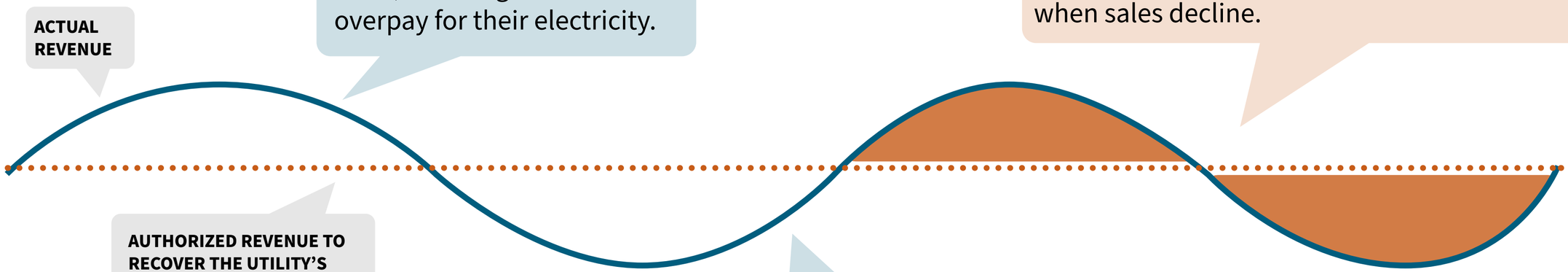
Revenue decoupling just ensures that the utility recovers its approved level of fixed costs.

- This is **good** for both the utility and its customers, because it keeps customers from overpaying and reduces the utility's risk of not recovering its prudently incurred costs.

How an RDM works in practice

DECOUPLING
The RDM trues up the difference between the revenues actually collected from customers and the amount approved by the regulator. This prevents the utility from profiting from increased sales, and it reduces the risk that it will not recover all its approved fixed costs when sales decline.

OVERCOLLECTION
The utility collects *more* than its approved level of fixed costs, meaning customers overpay for their electricity.



UNDERCOLLECTION
The utility collects *less* than its approved level of fixed costs.

Adapted from Fresh Energy, "Strategic electrification and revenue decoupling: different purpose, same goal," May 2, 2018.

Multi-year rate plans (MYRPs) encourage cost containment

PBR TOOL

WHAT IS IT?

MYRPs set the utility's revenue requirement and base rates for more than one year. They usually include:

1. A **rate-case moratorium;** and

2. A **mechanism that adjusts revenues over time** to reflect changing costs.

This adjustment can be based on forecasts, an index-based formula, or a hybrid. When the mechanism adjusts the utility's allowed revenues directly, it is known as a **"revenue cap."** If it adjusts the rates it can charge instead, it is known as a **"price cap."**

KEY BENEFITS

- Encourage cost efficiency
- Reduce the number of rate cases

KEY DRAWBACKS

- MYRP proceedings can be complex and contentious
- MYRPs present fewer opportunities to correct course (this can be partly addressed through an off-ramp* provision)
- Near an MYRP's end, the cost-efficiency incentive it creates tends to weaken (an efficiency carryover mechanism** can address this)

**An off-ramp (or re-opener) specifies particular circumstances under which the regulator will consider changes during the MYRP, either by adjusting specific aspects of it or by opening an entirely new rate case.*

***An efficiency carryover mechanism extends the period during which the utility enjoys a share of any cost savings it achieves (or bears a share of overspends) under a MYRP for a set number of years into the future, regardless of the year in which the expenditures occurred.*

If an index-based formula is used to adjust revenues, an "X factor" is usually included

The basic formula usually has the form I - X.

- The **"I factor"** represents inflation.
- The **"X factor"** represents productivity growth.

Productivity is how efficiently an industry converts inputs into outputs.

- For the utility industry, the inputs include capital, labor, and materials, and the output is the service provided to customers.

Productivity is usually estimated by analyzing the performance of a sample of similar utilities (a "peer group").*

- This is often done through a **total factor productivity (TFP) study.**

The X factor may also include a "stretch factor."

- This represents how much the utility can be **expected to "catch up"** to the rest of the industry.
- If the utility is already more efficient than its peers, the stretch factor can be set equal to zero.
- But if the utility is currently less productive than its peers, it should be able to improve faster than the overall industry trend. In this case a positive stretch factor is appropriate.

The stretch factor is usually set by analyzing the utility's performance relative to its peer group.

- This is known as a **benchmarking study.**

** How the peer group is constructed (e.g., the utilities, costs, and years included) can affect the estimated productivity growth. So consider how consistent the results are under different choices.*
*** Though a TFP study is useful, setting the X factor always requires regulatory judgment.*

It's important to understand how to interpret the X factor

In general, faster industry-wide productivity growth means a higher X factor value.

However, a low (or negative) X factor doesn't necessarily indicate poor performance. For example:

- Inputs may be growing faster than outputs for a **legitimate** reason (e.g., a capital investment surge due to the timing of infrastructure replacements, increased frequency of severe storms).
- Improvements in the industry's actual outputs may **not be reflected** in the measured outputs (e.g., reliability is improving but the number of customers is not changing).

The meaning of X also depends on I.

- If the I factor is an **industry-specific inflation index**, the X factor represents how fast the industry is becoming more efficient.
- If the I factor is an **economy-wide inflation index**, the X factor represents how much faster (or slower) the industry is becoming more efficient relative to the overall economy, as well as how much slower (or faster) industry-specific inflation is than economy-wide inflation.

Why does this matter?

- Setting the X factor affects utility revenues — so it can be a **controversial** topic in proceedings.
- It's important for stakeholders to understand the X factor to **effectively participate** in these discussions.

Capex-opex equalization reduces capex bias

WHAT IS IT?

Capex-opex equalization includes a range of strategies to reduce or eliminate capex bias.

Examples include:

- Opex capitalization, where a category of opex is amortized and the utility earns a return on it.
- Performance incentive mechanisms (PIMs) that target particular categories of opex.
- An efficiency carryover mechanism (ECM) calibrated to equalize the incentive to reduce capex and opex during an MYRP.
- Pooling opex and capex to form total expenditures (totex) in the revenue requirement formula.

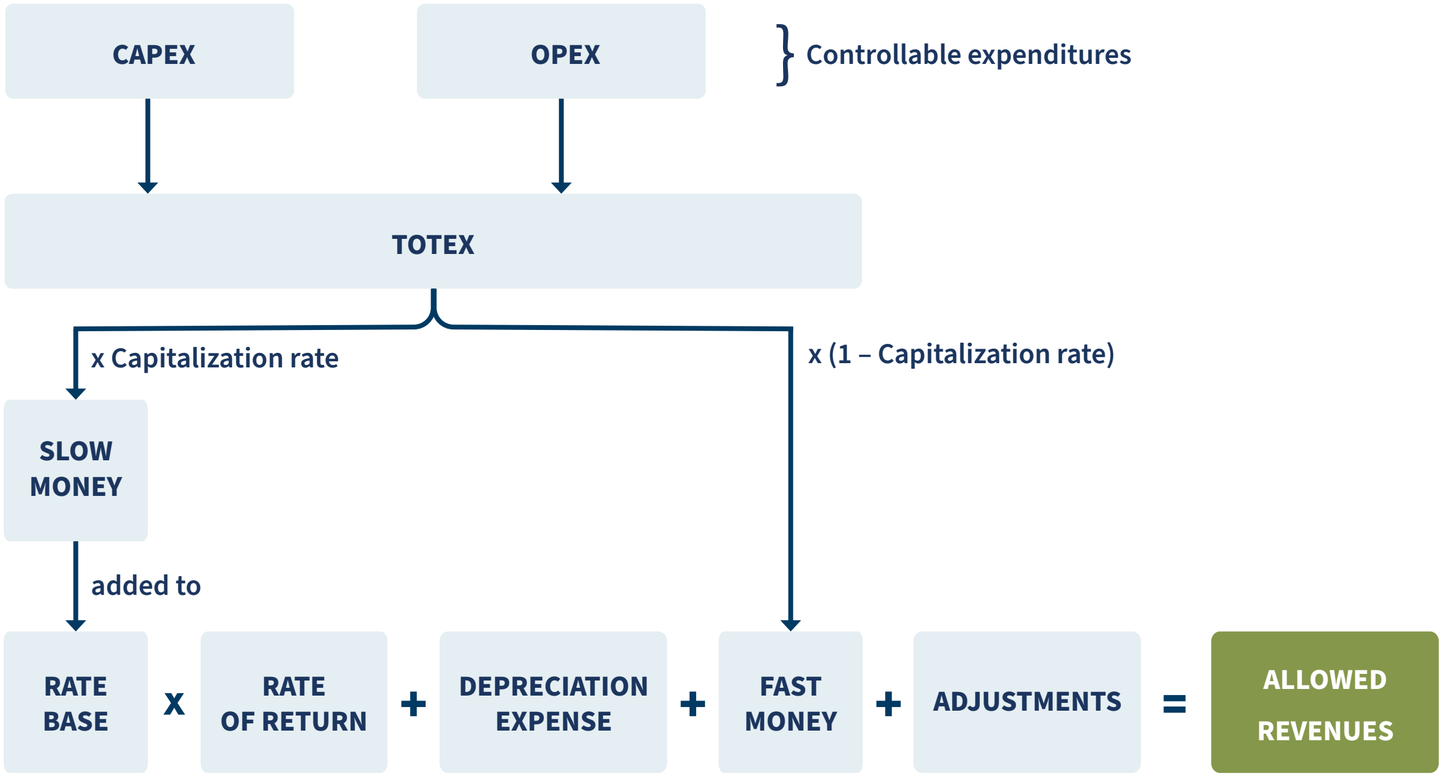
KEY BENEFITS & DRAWBACKS

- Capex-opex equalization strategies reduce or eliminate capex bias
- Narrow approaches are likely to be easier to implement, and the consequences of getting them "wrong" are likely to be more limited
- More comprehensive approaches can more thoroughly address capex bias, though they tend to be more complex and take longer to implement

Totex ratemaking is arguably the most comprehensive way to address capex bias

- Totex ratemaking allows the utility to earn the same return on both capex and opex
- It aims to address the root cause of capex bias
- It has not yet been implemented in the United States, but it is part of Great Britain's RIIO framework

The Revenue Requirement Formula Under Totex Ratemaking



Performance metrics and scorecards illuminate utility performance

WHAT ARE THEY?

A **metric** is a specific, quantifiable measure used to assess a utility's performance in achieving a desired outcome.

A **scorecard** pairs a reported metric with a performance target.

Public data dashboards can be used to display utility performance against metrics and scorecards to help promote transparency.

KEY BENEFITS

- Increase visibility and reduce information asymmetry
- The stakes for getting metrics and scorecards "wrong" are lower than for PIMs
- Can be used to gather baseline data for later PIMs

KEY DRAWBACKS

- Do not involve financial incentives and thus may fail to drive desired improvements
- Collecting data involves some costs

Performance incentive mechanisms tie utility revenues to desired outcomes

WHAT ARE THEY?

A PIM has three components: a metric, a target, and a financial incentive.

PIMs can be structured in many ways. For example:

- Failure to achieve a target triggers a penalty.
- An incremental incentive is applied over a range.
- The utility earns a share of estimated savings. This is known as a shared-savings mechanism.

PIMs should be designed to deliver net benefits to customers, and rewards should not be larger than needed.

KEY BENEFITS

- Can be used to motivate improved performance in specific areas
- Can reduce information asymmetry

KEY DRAWBACKS

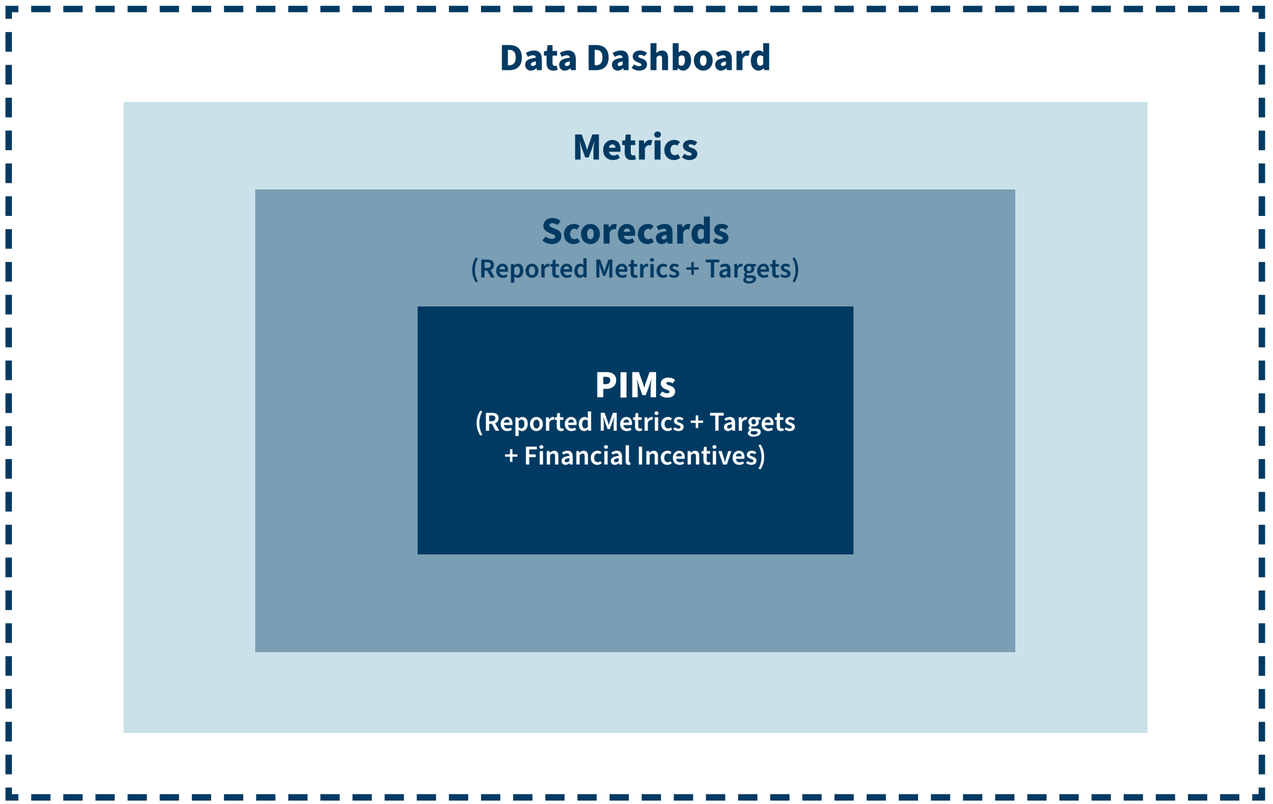
- Getting PIMs “right” can be challenging, especially for emergent outcomes
- PIMs may interact with each other and with other existing incentives
- PIM design can be contentious

Metrics, scorecards, and PIMs are closely related

Reported metrics, scorecards, and PIMs are designed to encourage better performance on a desired outcome. A data dashboard can strengthen the reputational incentives created by these three PBR tools.

Even though reported metrics and scorecards do not offer a financial incentive, they can create a **reputational incentive**. For instance, utilities may feel motivated to improve their publicly reported performance, understanding its influence on their standing with customers, regulators, and shareholders.

PIMs can provide both a financial and a reputational incentive.



Fuel-cost sharing mechanisms are a type of PIM

Fuel costs often represent a sizable share of customer bills, and fuel prices can be volatile.

Utilities can reduce fuel costs by operating plants more efficiently, helping customers save energy, and switching to renewables.

However, 100% of fuel costs are typically passed through to customers via a **fuel adjustment clause (FAC)**.

- FACs are usually implemented by building a forecast of fuel costs into utility rates, and then truing up the amount collected to reflect exactly what the utility spent via a rider.

A FAC insulates the utility from the risks of **poor fuel-cost management decisions** — and doesn't reward it for making good choices.

Fuel-cost sharing mechanisms are a type of PIM that address the problems created by FACs.

- They work by reducing the true-up between expected and actual fuel costs to less than 100%.
- This gives the utility some "skin in the game."

The PIM's **target** is the forecasted fuel cost, the **metric** is the difference between this and the actual fuel cost, and the **financial incentive** is equal to a percent of that difference.

By encouraging the utility to work harder to manage its fuel costs, fuel cost-sharing mechanisms can support **affordability** and encourage a **move away from fossil fuels**.

Benchmarking can help assess performance and set targets

WHAT IS IT?

Benchmarking means comparing a utility's performance to that of other utilities.

It is often used to calibrate the index-based formulas used to adjust revenues in MYRPs. However, it can also be used in other ways (e.g., to set PIM targets).

Benchmarking techniques range from simple to highly complex.

KEY BENEFIT

Can strengthen performance incentives by reducing the utility's ability to "game the system"

KEY DRAWBACKS

- Results depend on the peer group, years included, variables chosen, and other factors
- Utilities in unusual circumstances can be hard to benchmark
- Data availability can limit options
- More sophisticated methods can be opaque and difficult to check

PBR tools: Opportunities and challenges

TOOL	THE STRATEGIC OPPORTUNITY	THINGS TO WATCH OUT FOR
Revenue Decoupling	Reduces utility resistance to energy efficiency and distributed energy resources (DERs). By lowering the risk of cost under-recovery, reduces utility resistance to time-varying rates (particularly those with large on-peak to off-peak differentials, which without an RDM can threaten revenue stability).	Reduces the incentive to pursue end-use electrification, so other tools may be needed to incent utilities to pursue it.
MYRPs	Creates a cost-containment incentive that helps keep rates affordable. Can encourage utility adoption of cost-efficient clean energy and DERs. Can be attractive to utilities.	If poorly designed, can de-risk earnings, inflate profits, and fail to share efficiency gains with customers. Can incent utilities to skimp on necessary costs. PIMs may be needed to incent utilities to focus on critical outcomes while pursuing cost containment.

PBR tools: Opportunities and challenges

TOOL	THE STRATEGIC OPPORTUNITY	THINGS TO WATCH OUT FOR
Capex-Opex Equalization	Can encourage the adoption of cost-effective opex solutions — including clean energy and DERs.	Narrow approaches can be easier to implement, but impacts on capex bias will be more limited; more comprehensive approaches can be more complex. Though capex bias is a key barrier to cost efficiency, capex-opex equalization alone is insufficient to incent it. Other PBR tools that encourage cost containment should also be adopted.
Metrics & Scorecards	Increase visibility into utility performance. Can create a baseline for later PIMs.	Since no financial incentives are involved, may fail to motivate performance improvements on their own. A data dashboard can help strengthen reputational incentives.

PBR tools: Opportunities and challenges

TOOL	THE STRATEGIC OPPORTUNITY	THINGS TO WATCH OUT FOR
PIMs	Focus utilities on specific outcomes (e.g., DER deployment, social equity). Tying substantial revenue to PIMs could significantly realign utility incentives.	PUCs may be wary of using PIMs to significantly realign incentives or drive emergent outcomes, given potential ratepayer impacts should the PIM not work as intended. Utilities may propose unambitious targets.
Benchmarking	Can illuminate how well the utility is performing. Setting targets tied to external factors can reduce the utility's ability to game the system.	Results depend on how the model is structured and the peer group chosen (e.g., if a company is compared to peers operating under traditional COSR, benchmarking will not indicate what is possible under PBR). More sophisticated techniques can be difficult for regulators and others to check for accuracy.

Other Alternative Regulation (Altreg) Tools

- Earnings Sharing Mechanisms
- Forward Test Years
- Straight Fixed Variable Rates
- Lost Revenue Adjustment Mechanisms
- Cost Trackers & Formula Rates
- Opportunities & Challenges

Earnings sharing mechanisms (ESMs) reduce risk but weaken cost-containment incentives

OTHER ALTREG TOOLS

WHAT ARE THEY?

An ESM shares so-called “surplus” and/or “deficit” earnings when a utility’s actual ROE deviates from its approved ROE.

ESMs often have a **deadband** within which no sharing occurs, one or more bands in which earnings are shared, and a **cap (or floor)** beyond which customers retain all surpluses (or bear all deficits). They can be symmetrical or asymmetrical.

ESMs are often used in MYRPs — but they can also be implemented outside of an MYRP.

KEY BENEFITS

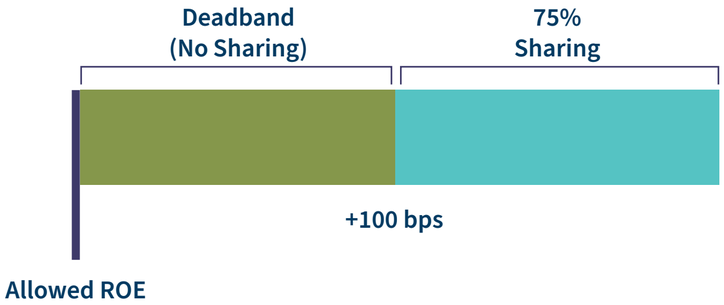
- Reduce the utility’s risk of underearning and customer’s risk of overpaying
- Reduce the risk of unexpected consequences
- Serve as “guardrails” when trying new things

KEY DRAWBACK

Weaken cost-containment incentives (since utilities can only keep a portion of overearnings and/or only bear a portion of underearnings)

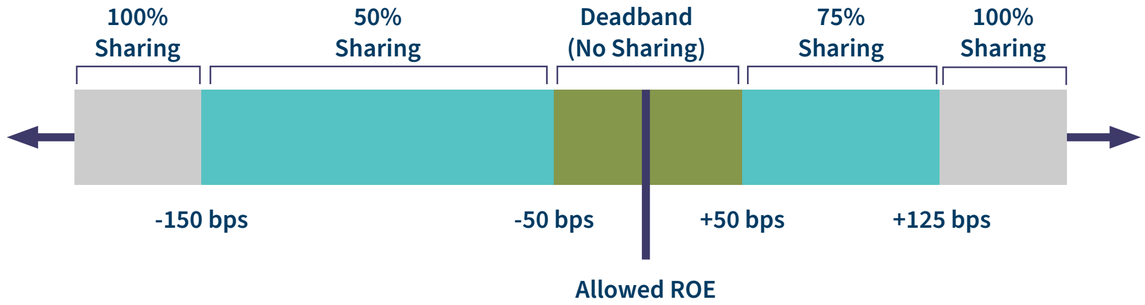
ESM examples

The **Massachusetts Department of Public Utilities** approved an **asymmetrical ESM** in Eversource's MYRP beginning in 2023, in which 75% of overearnings above 100 basis points (bps) are shared with customers:*



** Source: MA DPU, "Final Order" (Docket No. 22-22), 2022*

The **Vermont Public Utilities Commission** approved an **asymmetrical ESM** with adjustments for over- and under-earnings for Green Mountain Power in its 2020–2022 MYRP:**



*** Source: Green Mountain Power, "Multi-Year Regulation Plan 2020-2022"*

Forward test years reduce regulatory lag

OTHER ALTREG TOOLS

WHAT ARE THEY?

Under traditional regulation, a PUC evaluates the utility's cost of service based on an earlier 12-month period known as a **historical test year**.

A **forward test year** (or future test year) uses forecasted costs, investments, and sales from a projected future 12-month period to set rates instead.

Forward test years can be used for MYRPs, though they can also be used to set rates under traditional COSR.

KEY BENEFIT

Reduce or eliminate regulatory lag (this is particularly useful when conditions are changing rapidly)

KEY DRAWBACKS

- The accuracy of forecasts can be difficult to evaluate, which can increase the effort required during proceedings and generate controversy
- Unless revenue decoupling is in effect, utilities have an incentive to game their sales forecasts (i.e., to lowball them) to increase rates

Straight-fixed variable (SFV) rates erode utility and customer incentives

WHAT ARE THEY?

Under SFV rates:

- All costs that are fixed in the short term (e.g., meter reading, substations) are recovered via a fixed charge.
- The volumetric charge only recovers the variable costs (e.g., variable O&M costs).

KEY BENEFIT

Remove the throughput incentive

KEY DRAWBACKS

- Severely erode customers' incentive to save energy or adopt distributed generation
- The high fixed charges that result from SFV rates disproportionately affect low-usage customers, raising equity concerns
- Proponents claim SFV rates incent "economically efficient" consumption, but this is not true in the long term since higher usage requires more infrastructure. It's also not true from society's perspective, because the costs to human health and the environment of increased usage are not reflected in the volumetric charge

Lost revenue adjustment mechanisms (LRAMs) do not fully address the throughput incentive

OTHER ALTREG TOOLS

WHAT ARE THEY?

An LRAM estimates the revenues "lost" due to reduced energy sales, and then recovers that amount from customers. LRAMs are nearly always used to offset reduced revenues due to energy-efficiency programs.

States often use LRAMs as an alternative to RDMs.

KEY BENEFIT

Can compensate the utility for reduced sales due to energy-efficiency programs, reducing their resistance to implementing them

KEY DRAWBACKS

- Estimating lost revenues accurately is difficult
- LRAMs are not symmetrical
- They do not affect the utility's throughput incentive outside the targeted program
- They do not fully address the throughput incentive even within the targeted program (instead, they incent the utility to maximize the estimated energy savings while minimizing the actual savings)

Cost trackers and formula rates weaken cost-efficiency incentives

WHAT ARE THEY?

A **cost tracker** recovers specific costs outside of a rate case based on a formula or pre-existing rule.

A **formula rate plan (or formula rate)** automatically adjusts base rates outside of a rate case to ensure that revenues track costs, usually by adjusting rates to prevent the utility's actual ROE from straying too far from its approved ROE. A formula rate is in essence a broad-based cost tracker.

Though some MYRPs use a formula to adjust allowed revenues, MYRPs and formula rates are *not* the same thing!

KEY BENEFITS

- Ensure timely cost recovery
- Can reduce the frequency of rate cases

KEY DRAWBACKS

- Weaken cost-containment incentives
- Can reduce regulatory scrutiny
- Can function as "automated cost-plus ratemaking"

Other Altreg tools: Opportunities and challenges

TOOL	THE STRATEGIC OPPORTUNITY	THINGS TO WATCH OUT FOR
ESMs	Can be used with MYRPs to reduce the risk of unexpected outcomes.	Reduce the cost-containment incentive created by MYRPs.
Forward Test Years	Can better accommodate rapidly changing conditions (e.g., beneficial electrification) when setting rates.	The accuracy of forecasts can be difficult to evaluate. Unless an RDM is in use, can encourage gaming of sales forecasts.
SFV Rates	None (SFV rates create poor utility and customer incentives that promote spending, increase usage, and raise equity concerns).	Though SFV rates are sometimes referred to as “decoupling”, the impacts on utility and customer incentives are very different from RDMs.

Other Altreg tools: Opportunities and challenges

TOOL	THE STRATEGIC OPPORTUNITY	THINGS TO WATCH OUT FOR
LRAMs	Can reduce utility resistance to implementing energy efficiency programs. Could serve as a “first step” toward an RDM.	Though LRAMs are sometimes referred to as “decoupling,” they do not address the throughput incentive fully (and can encourage gaming). Compensate the utility for reduced sales, but do not compensate customers when sales are higher than forecast.
Cost Trackers & Formula Rates	**Cost trackers:** Can encourage utility spending in specific areas (e.g., enery efficiency programs). **Formula rates:** None (formula rates create poor cost-efficiency incentives relative to both MYRPs and traditional COSR).	Can function as “automated cost-plus ratemaking.” In recent years PUCs have expanded the use of cost trackers. Formula rates are sometimes referred to as “decoupling”, but they create very different incentives from RDMs.

PBR Processes

- Incremental vs. Comprehensive PBR
- Avenues for Advancing PBR
- Reform Processes
- Goals, Outcomes, and Metrics

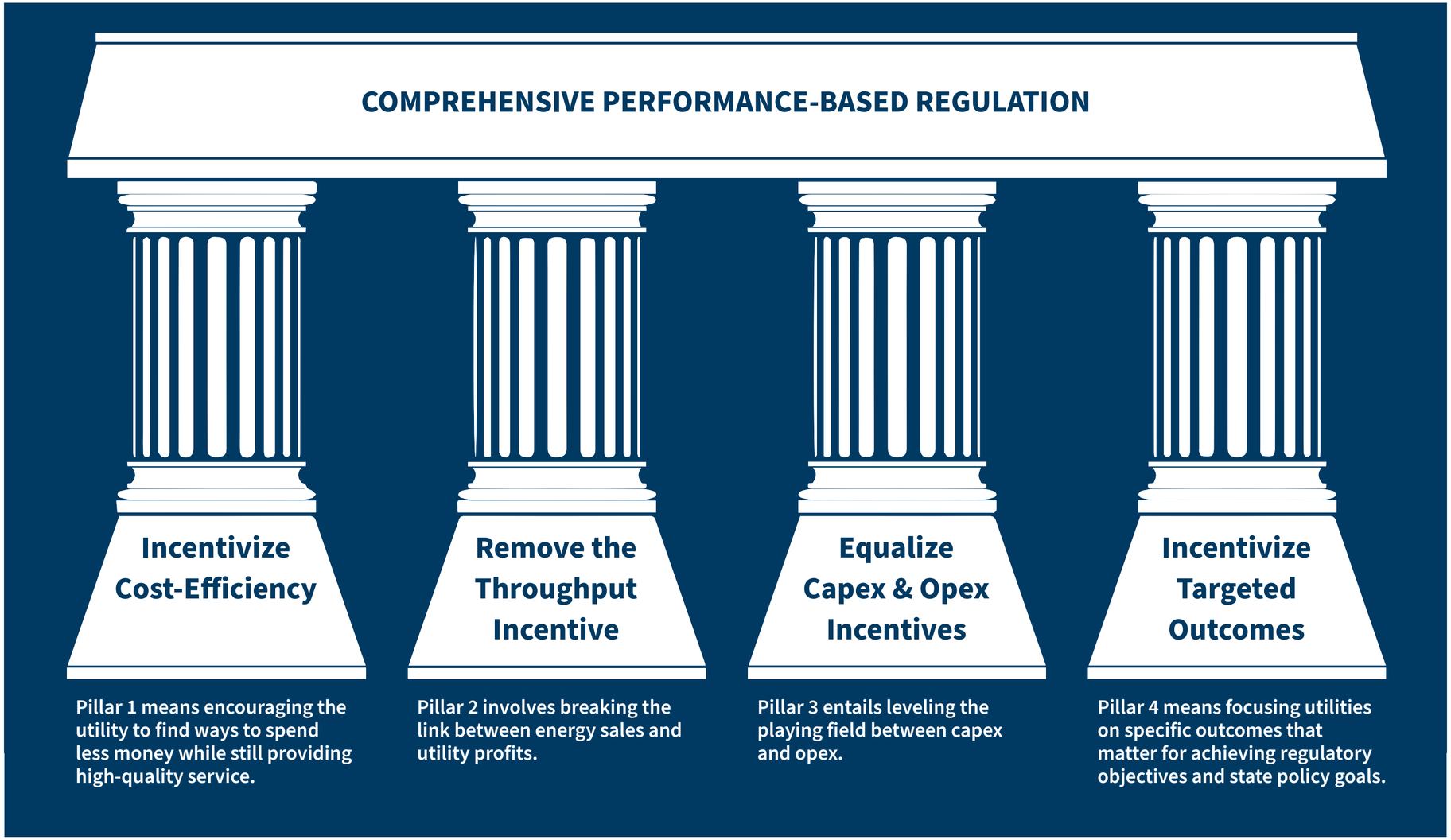
PBR can be seen as a spectrum from incremental to comprehensive reform

Incremental PBR	Comprehensive PBR
This involves “layering” certain PBR tools onto a traditional COSR-based framework	This approach fundamentally restructures the framework to improve the incentives it creates

But what does “fundamentally restructuring” the regulatory framework really mean?

We have developed a “Four Pillars Model” to clarify this.

Comprehensive PBR rests on four pillars



Incremental PBR offers benefits, but comprehensive PBR is the more robust reform option

Incremental PBR creates new incentives to *counteract the perverse incentives* created by traditional COSR, which ultimately cost customers money and prevent clean and demand-side solutions.

Incremental PBR is simpler and typically takes less time to develop.

Comprehensive PBR creates new incentives while also *removing the perverse incentives*, so the utility has a new, inherent motivation to control costs and pursue key policy goals.

Comprehensive PBR is more complex and can take a longer time to develop.

The use of incremental PBR does not preclude the adoption of comprehensive PBR. Rather, learnings gleaned through an incremental PBR framework can help set the stage for more comprehensive PBR down the line.

Avenues for advancing PBR reforms

LEGISLATIVE

Legislation may be needed to enable certain reforms. Legislation can also grant PUCs the authority to pursue PBR or direct them to do so.

REGULATORY

PUCs implement legislative mandates in regulatory proceedings. They can also spearhead PBR reforms or respond to utility proposals.

EXECUTIVE

Governors can issue executive orders providing guidance to PUCs or asking them to consider reforms. Attorneys general may also be able to petition PUCs to open PBR investigations.

UTILITY

Utilities can propose PBR reforms to the PUCs that regulate them.

The reform process can be complex – and long!

There is no one-size-fits-all PBR model	PBR design involves many choices that depend on local needs and priorities.
PBR intersects with other policies and processes	Utility regulation does not exist in a vacuum, but interfaces with other systems (e.g., legislation, administrative policies).
Unintended consequences are possible	PBR tools can interact with each other and with other utility incentives. As the complexity of the PBR framework grows, more time is needed to consider and address potential interactions.
Utilities may not cooperate	A utility that currently bears little risk and enjoys high returns may have little incentive to change. Utilities may also push for reward-only PIMs with easy targets while fighting deeper reforms.

Achieving PBR reforms take time. Individual proceedings can last for years, and the full suite of changes needed to move to comprehensive PBR can take even longer. Regulators, utilities, and advocates should keep this in mind.

PBR reform processes tend to follow a certain path

An initial exploration of PBR can be useful, but many states have initiated investigations only to then have the process stall. Setting clear goals from the beginning can help keep processes on track and achieve desired outcomes.

Maine: PBR Inquiry (Docket 2020-00344)

Connecticut: PBR Investigation (Docket 21-05-15; RE01/RE02/RE03)

Colorado: PBR Investigation (Docket 19M-0661EG)

Hawaii: PBR Proceeding (Docket 2018-0088)

To design an effective PBR framework, clear goals, outcomes, and metrics are critical

When developing a PBR framework, an important first step is identifying the objectives the framework is meant to achieve. A useful approach that has been used in multiple jurisdictions is to clearly define a set of goals, outcomes, and metrics.

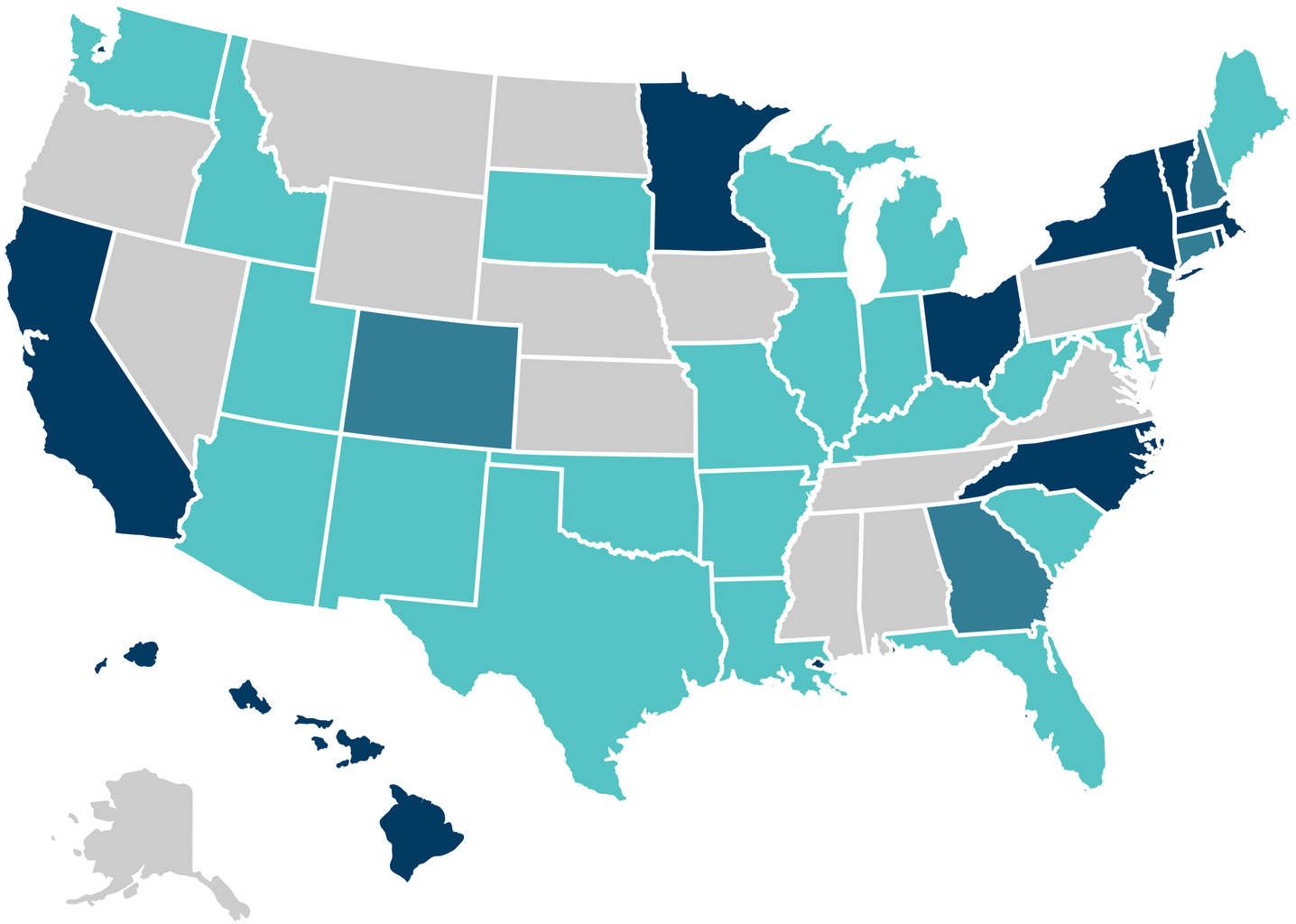
GOAL	A **goal** is a high-level objective of regulation that identifies a desired change or end state, but which may be too broad to be directly measurable.
OUTCOME	An **outcome** is a concrete result that shows progress toward one or more goals. Outcomes are observable and measurable, though there may be multiple ways to measure them.
METRIC	A **metric** is a specific, quantifiable measure used to track and assess progress toward an outcome. • An *activity-based* metric tracks a utility action or intermediate step that is expected to lead to an outcome. • A *program-based* metric tracks the progress of a utility program. • An *outcome-based* metric tracks the outcome of interest.

Case Studies

- Current Landscape of PBR
- Colorado
- Hawaii
- The Impact of Legislation

States with PBR

The following map shows which states use decoupling, MYRPs, and PIMs; which states use two of these tools; and which states use just one tool.



Source: Mark Lowry, Performance-Based Regulation for Energy Utilities (October 2023), NARUC Regulatory Training Initiative

15+ states have adopted PIMs tied to emergent outcomes, such as social equity, grid resilience, and demand flexibility

HAWAII

The Hawaii PUC adopted a portfolio of PIMs for Hawaiian Electric as part of the comprehensive PBR framework adopted in 2020. These include incentives tied to:

- Faster Renewable Portfolio Standard (RPS) achievement
- Increased use of DER grid services
- Advanced metering infrastructure (AMI) utilization

NEW YORK

New York provides a great example of how PIMs can evolve over time. The New York Public Service Commission has approved a variety of PIMs for each utility in the state over the years, including:

- Greenhouse gas reduction
- DER interconnection and utilization
- Beneficial electrification

ILLINOIS

The Illinois Commerce Commission adopted a portfolio of PIMs for ComEd and Ameren in 2022, which include:

- Reduction in utility disconnections
- Increased reliability, including in environmental justice communities
- Peak load reductions

COLORADO

The Colorado PUC has adopted multiple PIMs for Xcel Energy to date. These include:

- Equitable transportation electrification
- Climate-forward demand-side management

Check out RMI's PIMs Database for more information on current PIM designs in the United States

PBR Case Study: Colorado

Incremental PBR Reforms

PBR Highlights from the Centennial State:

MYRPs: Xcel operated under three-year MYRPs from 2012 to 2014 and 2015 to 2017.

Revenue Decoupling: In 2014 Xcel proposed an RDM, in 2017 a pilot program was approved, and in 2020 it was finally implemented.

PBR Framework: In 2019 the legislature directed the PUC to consider PBR reforms, and in 2020 the PUC conducted an investigation and delivered a report to the legislature recommending that the commission and utilities build on existing PIMs and establish desired outcomes for performance.

PIMs:

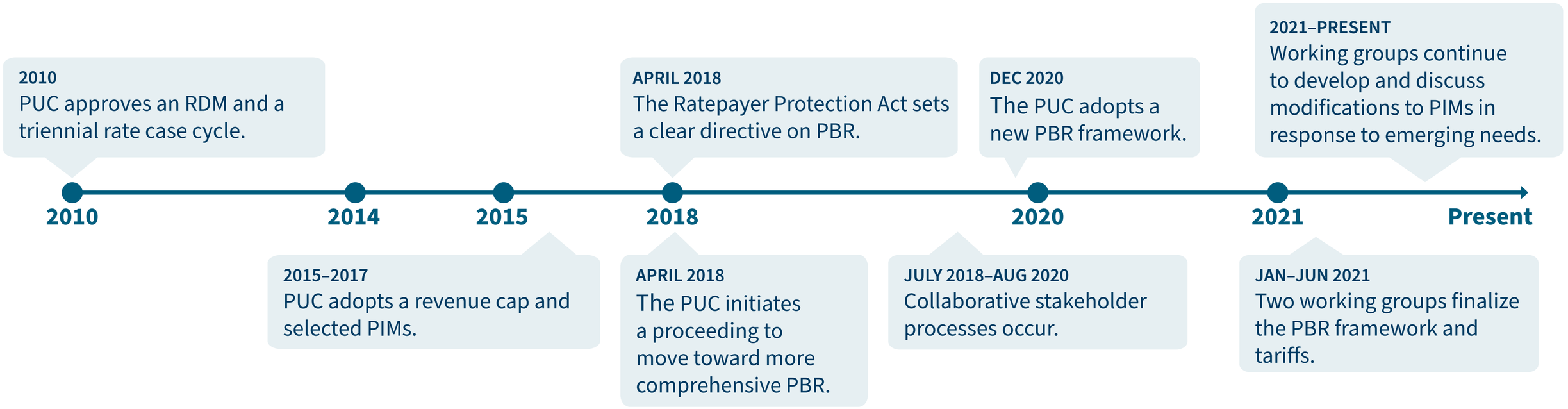
- For years, Xcel and Black Hills Energy have had PIMs focused on DSM and other traditional outcomes.
- An equity PIM was implemented in 2021–2023 as part of Xcel's Transportation Electrification Plan. Xcel proposed to continue this PIM in its 2024-2026 Transportation Electrification Plan.
- The PUC recently adopted new PIMs for Xcel to incentivize cost containment for its generating plants.

PBR Case Study: Hawaii

A Long and Effortful Journey to Comprehensive PBR

The Aloha State's current PBR framework includes:

- A five-year MYRP with an indexed revenue adjustment formula, an ESM, and a re-opener to protect the utility and customers from excessive utility earnings or losses.
- PIMs for DER interconnection timeliness, acquisition of DER grid services, accelerated RPS achievement, energy efficiency for low-income customers, AMI utilization, and others.
- An RDM and support for innovative pilots.



The legislative directive on PBR in Hawaii was much stronger than in Colorado

Hawaii SB 2929

The PUC "**shall establish performance incentives and penalty mechanisms** that directly tie an electric utility's revenues to that utility's achievement on performance metrics and **break the direct link between allowed revenues and investment levels**"

View legislation on Hawaii.gov →

Colorado SB 19-236

The PUC shall prepare a **"report"** that includes "**a general determination** as to whether a transition to performance-based metrics regulation of a regulated utility would be **net beneficial to the state**".

View legislation on Colorado.gov →

Further Reading

- General Overviews of PBR
- PBR tools
- Case studies

More information can be found using the links below.

General Overviews of PBR

NCSL

Performance-Based Regulation: Harmonizing Electric Utlity Priorities and State Policy

RAP and NREL

Next-Generation Performance-Based Regulation: Emphasizing Utility Performance to Unleash Power Sector Innovation

Energy Innovation

Going Deep On Performance-Based Regulation

RMI

States Move Swiftly on Performance-Based Regulation to Achieve Policy Priorities

PBR tools

More information can be found using the links below.

Decoupling

RAP

Revenue Regulation and Decoupling: A Guide to Theory and Application (incl. Case Studies)

MYRPs

LBNL

State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities

SYNAPSE

Multi-Year Rate Plans: Core Elements and Case Studies

Capex-Opex Equalization

RMI

Making the Clean Energy Transition Affordable: How Totex Ratemaking Could Address Utility Capex Bias in the United States

PIMs

RMI

PIMs Database

RMI

PIMs For Progress: Using Performance Incentive Mechanisms to Accelerate Progress on Energy Policy Goals

ACEEE

Snapshot of Energy Efficiency Performance Incentives for Electric Utilities

Case studies

More information can be found using the links below.

Hawaii

RMI

Five Lessons from Hawaii's Groundbreaking PBR Framework

Colorado

Colorado PUC

Investigation into Performance Based Regulation in Colorado § 40-3-117, C.R.S.

Connecticut

Public Utilities Regulatory Authority

PURA Resets Electric Utility Regulatory Framework to Better Serve the Public

Maine

Energy Central News

Maine Public Utilities Commission Opens Case to Consider Performance Metrics for Maine Electric Utilities

THANK YOU!

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