



# Examples & Lessons Learned from PBR in Practice

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# RMI works to transform the global energy system to secure a clean, prosperous, zero-carbon future for all

DECARBONIZING

## Key Sectors



Electricity



Buildings



Transportation



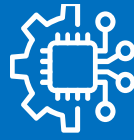
Industry

USING

## Powerful Market Catalysts



Market-enabling Policy



Technology



Finance



Data & Transparency



Education & Workforce Training



Strategic Communications

TO

## Drive Energy Transitions Around the World



# Introductions

Cara Goldenberg | Principal  
Electricity



Gennelle Wilson | Manager  
Electricity



# What's on deck:

## Objectives

- Highlight other jurisdictions' experiences with in implementing PBR, both comprehensive and incremental.
- Describe the processes that lead to the development and proposal of PBR reforms to the regulatory framework.

## Agenda

- Incremental versus Comprehensive PBR
- Comprehensive PBR Case Studies
  - Hawaii
  - North Carolina
  - Q&A
- Incremental PBR Case Studies
  - Colorado
  - Maryland
  - Minnesota
  - Q&A
- Take-aways
- Discussion

# What is Performance-Based Regulation?

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

- PBR is not new, but it has been attracting more attention due to the growing discrepancy between the outcomes created by traditional cost-of-service regulation (COSR) and modern policy goals.
- PBR is not just one thing. Instead, it is a collection of tools that can be used in different ways.



# **Incremental versus comprehensive PBR**

# A useful distinction can be made between incremental and comprehensive PBR

## **Incremental PBR**

This approach involves layering select PBR tools onto a traditional COSR-based framework.

## **Comprehensive PBR**

This involves fundamentally restructuring the framework to improve the incentives it creates.

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

# 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.**

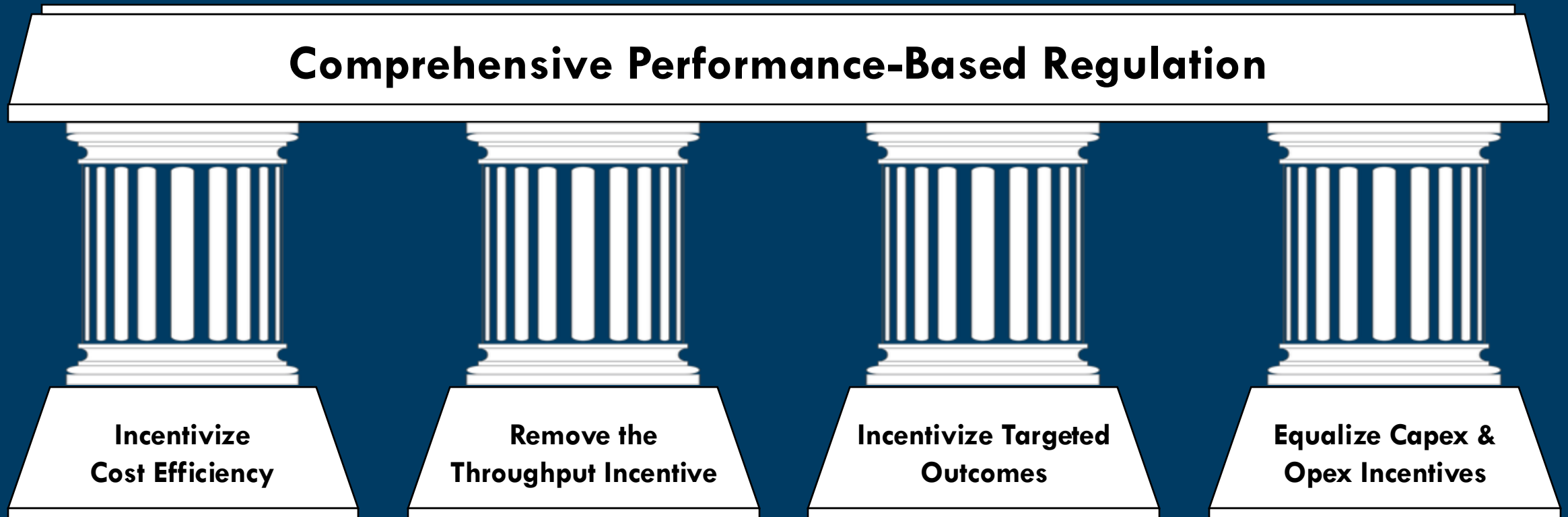
**Comprehensive PBR** creates new incentives while also *removing the perverse incentives*, so the utility has a new, inherent motivation to control costs and pursue key policy goals.

**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.



# The four pillars of comprehensive PBR



# Particular PBR tools can support each pillar

## **Pillar 1: Incentivize Cost Efficiency**

Multiyear rate plans (MRPs), Shared savings mechanisms (SSMs), Fuel-cost sharing mechanisms, Metrics, Scorecards

## **Pillar 2: Remove the Throughput Incentive**

Revenue decoupling mechanisms (RDMs)

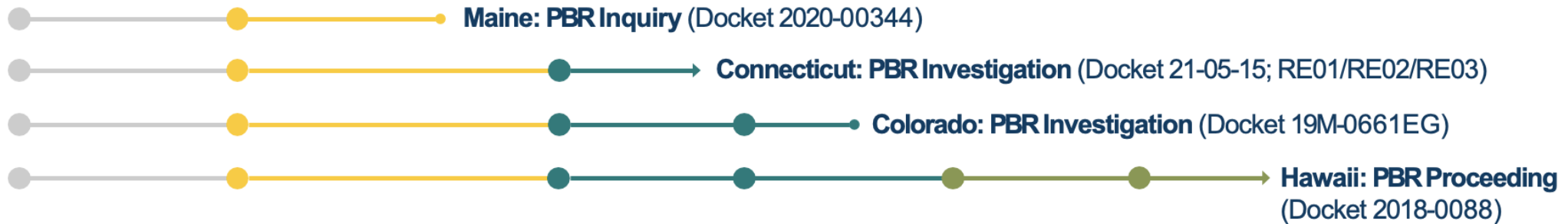
## **Pillar 3: Equalize Capex and Opex Incentives**

Capex-opex equalization strategies

## **Pillar 4: Incentivize Targeted Outcomes**

Metrics, scorecards, and PIMs

# 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.**

# However, PBR process can be complex & 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 be resistant to change

- 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.**

# Questions?



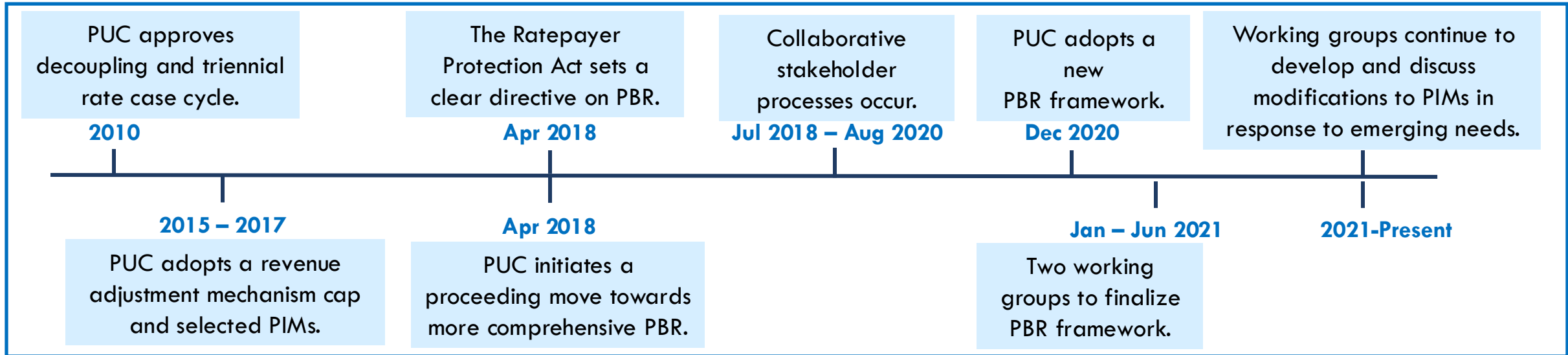


# **Comprehensive PBR Case Studies**



# Hawaii

# Hawaii's PBR journey began incrementally



**The proceeding of Hawaii's PBR design process was split into two phases:**

Key stakeholders included:

- consumer advocates,
- environmental groups,
- solar trade associations, and
- municipal governments.

## Phase 1

Established guiding principles for the PBR framework and twelve regulatory outcomes focused on both traditional and emergent utility responsibilities. Phase 1 also prioritized a portfolio of PBR mechanisms for examination in Phase 2.

## Phase 2

Stakeholders discussed, evaluated and vetted specific PBR proposals.



# The process began with clear goals and outcomes to inform PBR design

Goal	Priority Outcome	
Enhance Customer Experience	Traditional	Affordability
		Reliability
	Emergent	Interconnection Experience
		Customer Engagement
Improve Utility Performance	Traditional	Cost Control
	Emergent	DER Asset Effectiveness
		Grid Investment Efficiency
Advance Societal Outcomes	Traditional	Capital Formation
		Customer Equity
	Emergent	GHG Reduction
		Electrification of Transportation
		Resilience

- In Phase 1, the investigation examined the current regulatory framework and identified areas of utility performance that were deserving of further focus. With stakeholder input, the PUC established three **guiding principles** to inform the development of an updated PBR Framework:
  - A customer-centric approach, including immediate “day 1” savings when the new regulations takes effect;
  - Administrative efficiency to reduce regulatory burdens to the utility and stakeholders; and
  - Utility financial integrity to maintain the utility’s financial health, including access to low-cost capital.
- The Commission also adopted **three overarching regulatory goals** and **12 priority outcomes** that served as guideposts for the stakeholder process to design the PBR framework.

# Hawaii's Comprehensive PBR Framework

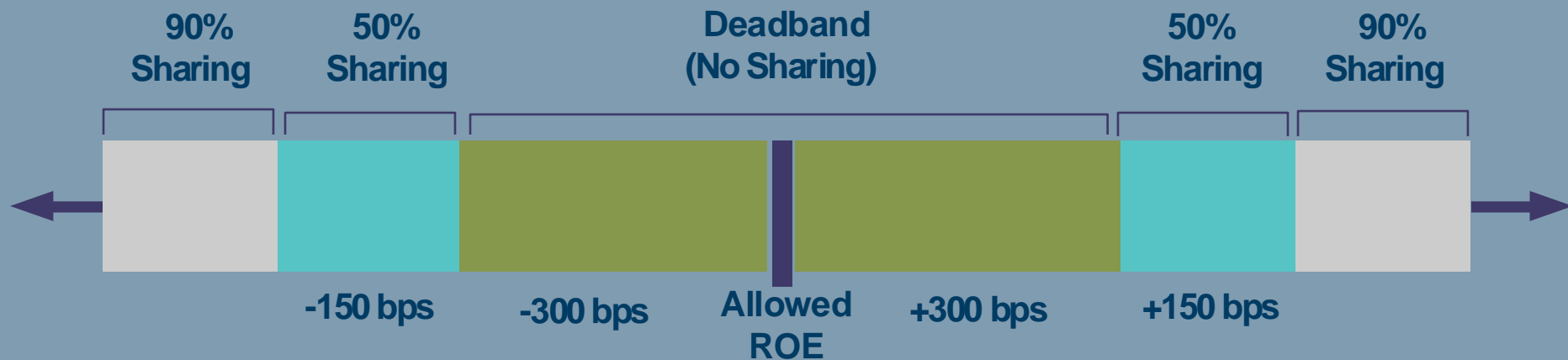
## MRP

- A five-year MRP with going-in rates based on previous rate cases (2017, 2018, and 2019)
- Indexed annual revenue adjustment for both capex and opex = I-Factor (inflation) - X-Factor (productivity) + Z-Factor (exogenous events) - Customer Dividend
- Fourth rate year review of the PBR Framework to determine if any modifications or revisions are appropriate

## Revenue decoupling

- Full revenue decoupling

## Earnings sharing mechanism



# Hawaii's PBR Framework (cont'd)

## PIMs

- PIMs for DER interconnection timeliness, acquisition of DER grid services, accelerated RPS achievement, energy efficiency for LMI customers, AMI utilization, and others.
- Collective shared savings mechanism (CSSM) provides incentive to contain costs that are not recovered through the the annual revenue adjustment formula of the MRP (i.e., fuel costs, purchased power costs, and EPRM costs)

## Incremental Capital Funding

- Extraordinary Projects Recovery Mechanism ("EPRM") provides "above the ARA" relief for extraordinary projects on a case-by-case basis; EPRM is applicable to both O&M expenses and capital expenditures.

## Other Safeguards

- A Re-Opener investigation is triggered to evaluate what adjustments to specific PBR mechanisms are needed if the utility's earned ROE enters the outermost sharing tiers of the ESM or if a utility's credit rating falls below investment-grade status. Commission also can initiate Re-Opener at their own discretion.

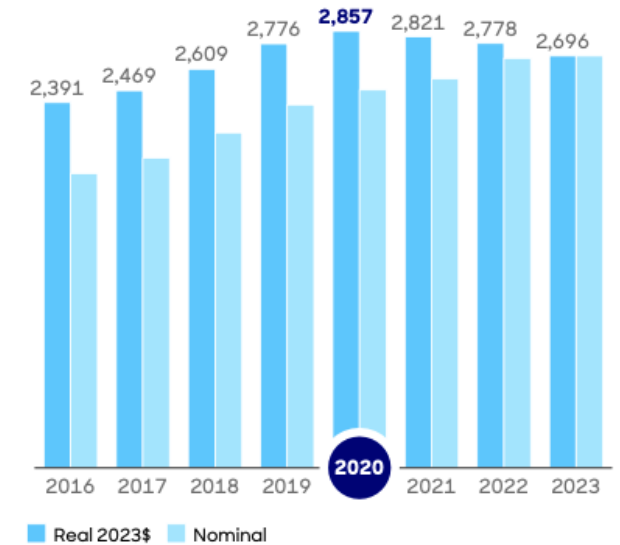
## Other elements

- Innovation Pilot Process (\$10 million per year) to foster innovation by establishing an expedited implementation process for pilots that test new technologies, programs, business models, and other arrangements

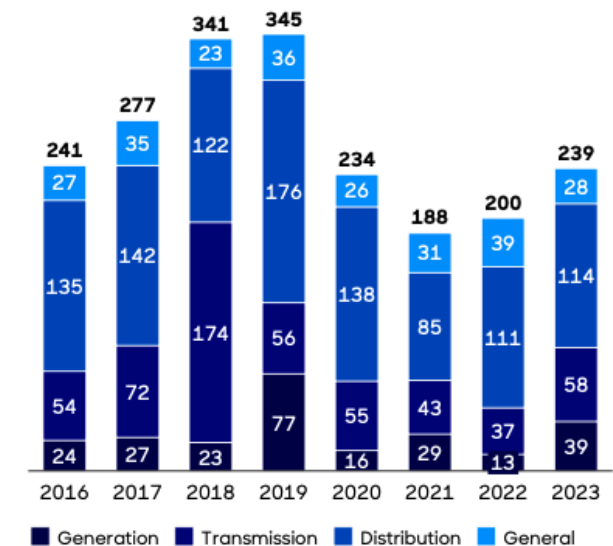
# Experience in first MRP

- Credit ratings:
  - Moody's upgraded Hawaiian Electric's credit rating from Baa2 to Baa1 (April 2021) following the comprehensive PBR framework going into effect.
  - 2023 Maui Wildfire led to Hawaiian Electric credit ratings downgrade to junk status.
- The fourth-year evaluation of PBR is currently underway in Docket No. 2018-0088.
- Stakeholder analysis of HECO's financials suggests:
  - **Limited shifts in O&M costs** during the first three years of the MRP,
  - The **rate base has declined** in real terms over the first three years of the MRP,
  - The utility **has reduced capital expenditures** compared to before the MRP, and
  - Actual ROE has stayed well within the ESM deadband

HECO Rate Base  
[USD M]



HECO Annual Capital Expenditures  
[Nominal USD M]



Docket No. 2018-0088, "Ulupono Initiative LLC's Brief on Re-Basing Target Revenue," Hawaii Public Utilities Commission, December 5, 2024, <https://hpuc.my.site.com/cdms/s/puc-case/a2G8z0000007fLQEAY/pc21581?tabset-431dc=3>.

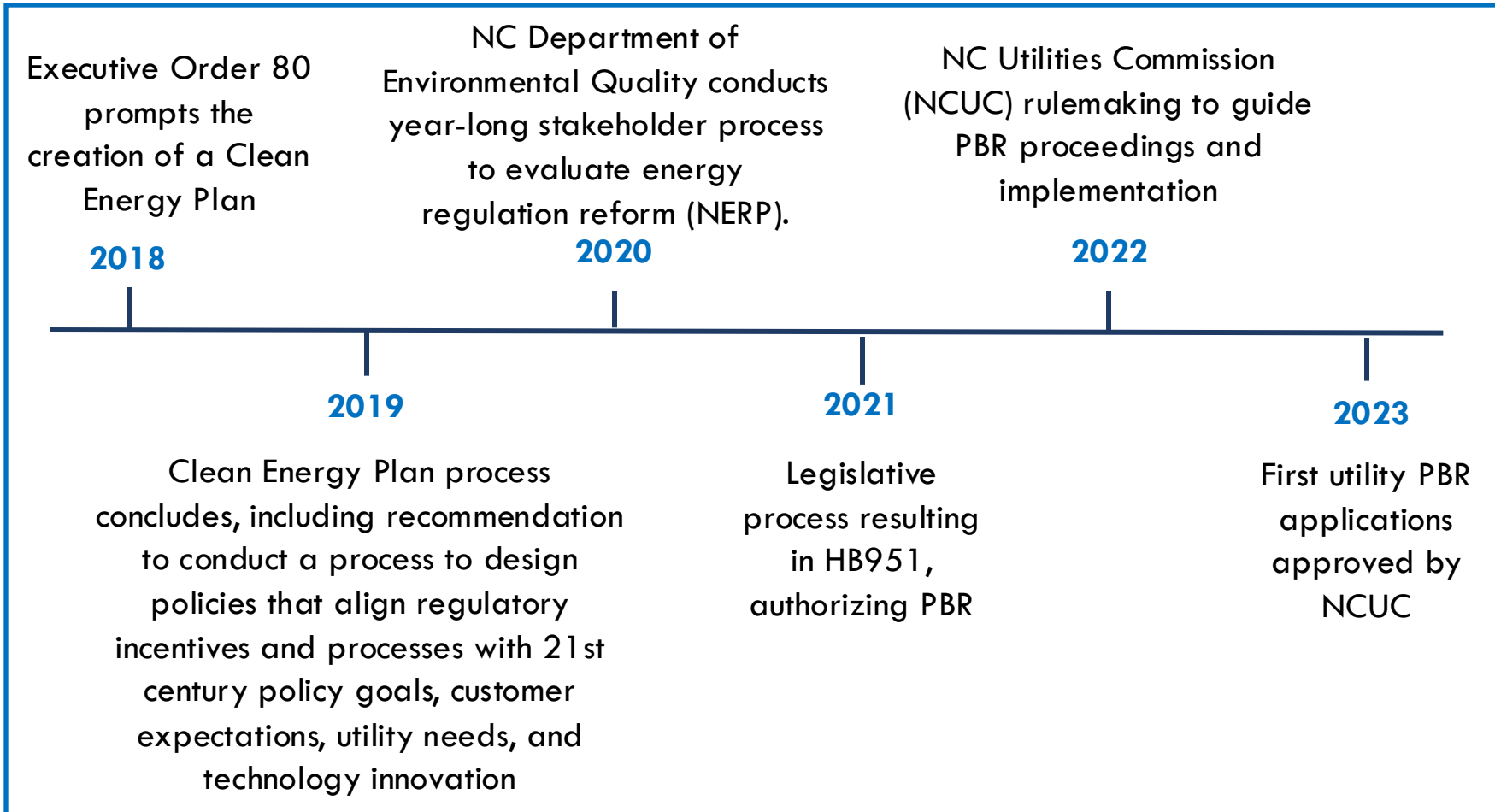
# Assessment of the Hawaii PBR framework

Outcome	RMI assessment
<b>Incentivize cost efficiency</b>	<ul style="list-style-type: none"> <li>• Annual revenue adjustments focused on cost control</li> <li>• Earnings sharing mechanism with a wide deadband</li> <li>• Collective shared savings mechanism to incentivize cost efficiency across cost trackers</li> <li>• Fuel-cost sharing mechanism</li> <li>• Metrics and scorecards focused on utility spending trends</li> </ul>
<b>Remove throughput incentive</b>	<ul style="list-style-type: none"> <li>• Full decoupling since 2010</li> </ul>
<b>Equalize capex and opex incentives</b>	<ul style="list-style-type: none"> <li>• Adopted PIMs that support capex-opex equalization</li> <li>• Allow recovery of opex through EPRM</li> <li>• Looking forward, more can be done to focus on this outcome</li> </ul>
<b>Incentivize targeted outcomes</b>	<ul style="list-style-type: none"> <li>• Large portfolio of PIMs, scorecards, and metrics focused on the 12 priority outcomes</li> <li>• Ongoing working group process set up to evaluate and iterate PIM effectiveness and explore new PIMs to address emerging challenges</li> </ul>



# North Carolina

# The journey to PBR in NC was more recent



## NERP Guiding Outcomes

Outcome Category	Outcome
Improve customer value	<ul style="list-style-type: none"> <li>• <b>Affordability and bill stability</b></li> <li>• Reliability</li> <li>• Customer choice of energy sources and programs</li> <li>• Customer equity</li> </ul>
Improve utility regulation	<ul style="list-style-type: none"> <li>• <b>Regulatory incentives aligned with cost control and policy goals</b></li> <li>• Administrative efficiency</li> </ul>
Improve environmental quality	<ul style="list-style-type: none"> <li>• <b>Carbon neutral by 2050</b></li> <li>• Integration of DERs</li> </ul>
Conduct a quality stakeholder process	<ul style="list-style-type: none"> <li>• Inclusive</li> <li>• Results oriented</li> </ul>

Prioritized outcomes are **bolded**.

# The NC PBR framework is enshrined in statute, limiting regulatory authority.

## MRP

- Three-year duration
- First year base rates are equal to a historical test year, actual costs + “a set of discrete and identifiable capital spending projects to be placed in service during the first-rate year”; successive rate-years based on projected incremental capital investment.
- Annual adjustments to second and third rate-years capped at a 4% increase over prior year revenue requirement
- Revenue attributable to any new generation plant placed in service during MRP that >\$500 million is not included in MRP; instead, receives regulatory asset treatment, recovery considered in future rate case proceeding

## Earnings sharing mechanism

- Annual return of 100% of excess earnings to ratepayers if ROE exceeds 50 basis points + authorized ROE
- No sharing of earnings deficits

## Revenue decoupling

- Applicable only to the residential class
- Excludes estimated sales for electric vehicle charging, including EV charging during off-peak periods on time-of-use rates,
- Net-lost revenue adjustment mechanism applicable to non-residential customers



# NC PBR framework (cont'd)

## PIMs

- Total value of all potential and actual PIM incentives or penalties cannot exceed 1% of first rate-year total annual revenue requirement
- Incentives related to demand-side management and energy efficiency measures excluded from the limit

## Stay-out provision

- Utility allowed to file a new rate case if earnings are lower than the authorized ROE

## Other tracked costs

- Cost trackers remain
- No mechanism to encourage cost control of other tracked costs (e.g., fuel adjustment clause)

# Duke Energy's current MRPs

- Duke Energy Carolinas and Progress authorized ROEs of 10.1% and 9.8%, respectively (requested 10.4%). Previously authorized 9.6%.

Revenue requirement annual change

	Duke Energy Carolinas		Duke Energy Progress	
	\$ million	% change from prior year	\$ million	% change from prior year
Rate year 1	436	8.3%	234	5.8%
Rate Year 2	173	3.3%	126	3.2%
Rate year 3	165	3.1%	138	3.4%

- PIMs approved for reliability, renewables integration, and increasing customer participation in time varying rates. Tracking metrics for call center performance, estimated incremental electric load used for EV charging, 10 worst performing circuits (SAIDI, SAIFI, CAIDI), residential disconnections due to nonpayment of bills, and residential average customer bill compared to federal poverty limit guidelines.

Duke Energy, "[Duke Energy Progress receives approval for new rates in North Carolina, implements new programs to help customers](#)," 2023.

Duke Energy, "[Duke Energy Carolinas receives approval for new rates in North Carolina, implements new programs to help customers](#)," 2024.

# Assessment of the NC PBR framework

Outcome	RMI assessment
<b>Incentivize cost efficiency</b>	<ul style="list-style-type: none"> <li>• MRP costs based upon forecasted capital costs creates an incentive for the utility to exaggerate both capital spending and opex to secure a higher approved revenue requirement.</li> <li>• ESM with narrow deadband and 100% savings returned to ratepayers unlikely to motivate deeper savings.</li> <li>• Utilities can file a new rate case if its earnings fall short of expectations.</li> </ul>
<b>Remove throughput incentive</b>	<ul style="list-style-type: none"> <li>• Revenue decoupling mechanism applies only to residential class, subject to removal of estimated sales to EVs, which creates unnecessary complexity.</li> <li>• Throughput incentive for commercial and industrial customer classes less meaningfully addressed by net lost revenues adjustment mechanism.</li> </ul>
<b>Equalize Capex and Opex Incentives</b>	<ul style="list-style-type: none"> <li>• Not established in statute but could be achieved via PIMs in future PBR applications.</li> </ul>
<b>Incentivize targeted outcomes</b>	<ul style="list-style-type: none"> <li>• 3 performance incentive mechanisms, combined upside value of \$8 to \$10 million per year.</li> <li>• Cost trackers maintained and not absorbed into the rate base subject to the MRP.</li> </ul>

# Questions?





# Incremental PBR State Case Studies

- Colorado
- Minnesota
- Maryland



**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 and a beneficial electrification PIM is being implemented in 2024-2026.
- The PUC recently adopted PIMs to incentivize cost containment for utility-owned projects selected in Xcel’s all-source procurement process.



## MRP

- Xcel Energy has operated under three- and four-year MRPs since 2015 (interim rates have also been used to extend duration).
- Supplemental cost recovery tools allowed but highly encouraged to be consolidated into base rates.
- Revenues adjusted according to cost-of-service forecasts with one-way capital-spending true-up

## RDM

- In 2009, the MPUC established criteria and standards to be utilized in pilot proposals for RDMs.
- Xcel Energy's first decoupling pilot began in 2017-2020. Otter Tail Power Company also started a decoupling pilot program in 2022.
- Ratepayer classes decoupled in different ways.

## Performance metrics

- Xcel has a portfolio of 33 metrics against six outcomes: affordability, reliability, customer service quality, environmental performance, cost-effective alignment of generation and load, and workforce and community development.
- Four years of data against these metrics are available for 2020-2024 in Dock No. Ci-17-401.
- Initial intent to evolve metrics into PIMs, though that outcome is uncertain with recent MPUC decision.



## MRP

- In 2020, the MD PSC approved an optional "pilot" for MRPs after a four-month stakeholder process.
- Revenue requirements can be determined using historical test year data and forecasts for up to three future test years.
- Forecasts must include project-level data for the first year and program-level data for the second and third years. For any projected "large capital expenditures" over \$1 million or 0.5% of the utility's annual capital budget, project-level data is necessary.
- A reconciliation adjustment allows recovery of spending that exceeded approved revenues in future rate cases.
- The PSC plans a "lessons learned period" after each utility's first MRP to discuss possible changes (currently in [Case No. 9618](#)).
- Utilities can define the criteria for terminating or modifying the MRP.

## Revenue decoupling

- Revenue decoupling for some electric (Pepco & BGE) in place since 2015.

## Performance mechanisms

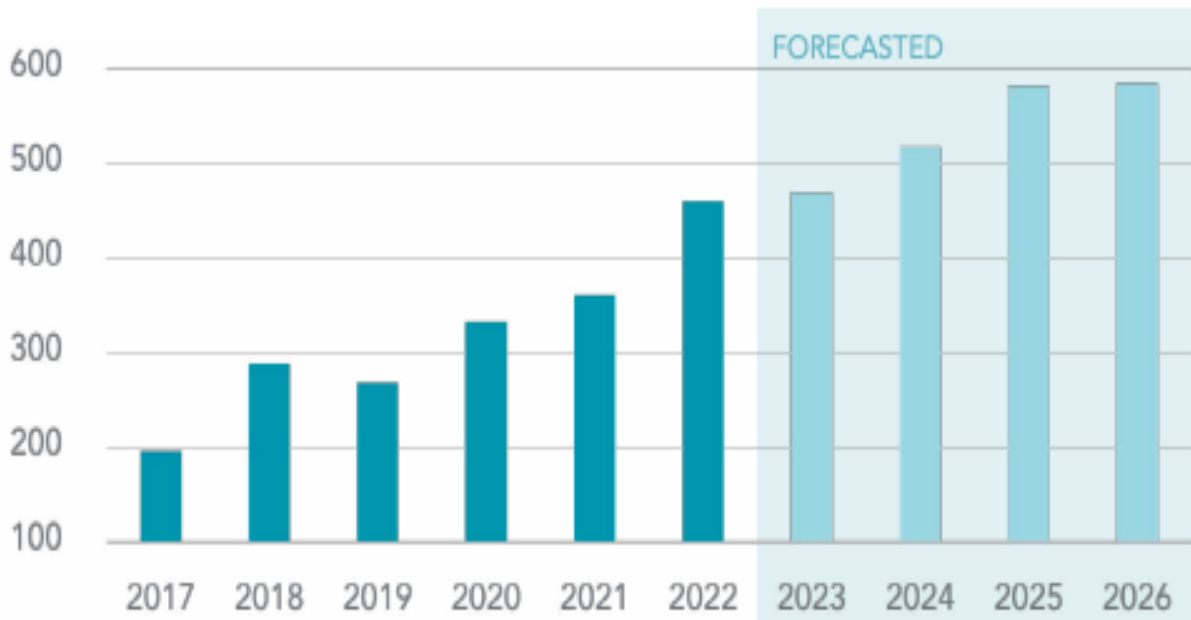
- None have been established to date.



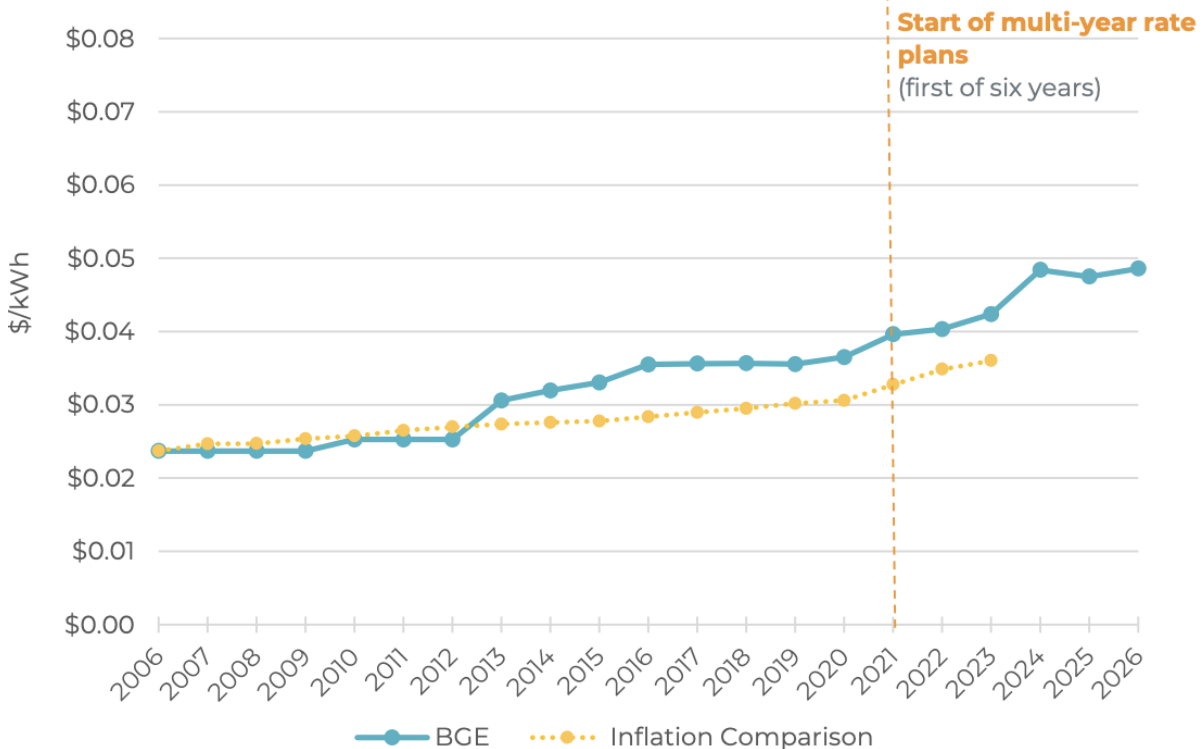


# BGE Example

BGE Electric Distribution Plant Additions (\$ millions)



BGE Electric



Maryland Office of Peoples Counsel, [Maryland's Utility Rates and Charges](#), 2024.

Maryland Office of People's Counsel, [A Consumer's Guide To: BGE's Proposed Multi-Year Rate Plan](#), 2023.



# Distribution rates have increased significantly under MRPs

Utility	Distribution rate (/kWh)		
	2010	2024	Yearly Average Increase
Potomac Edison	\$0.0169	\$0.0229	2.3%
SMECO	\$0.0289	\$0.0470	3.6%
BGE*	\$0.0253	\$0.0459	4.6%
Delmarva Power*	\$0.0317	\$0.0698	6.0%
Pepco*	\$0.0263	\$0.0618	6.4%

Typical customer paying \$145 more per year, than in 2020

Typical customer paying \$97 more per year than in 2023

Typical customer paying \$172 more per year than in 2021

\* Utilities that have had or operate under MRPs since 2020.

# Take-aways from PBR design and implementation from other state experiences



A wholistic reform strategy is needed, including clarity on outcomes and desired end state.



Assess the existing regulatory framework.



Take a portfolio approach to PBR design.



MRPs and revenue adjustment mechanisms should be designed with cost control front of mind.



Consider the interactions between mechanisms (e.g., decoupling, revenue adjustments, and PIMs).



Ensure opportunities for evaluation and updates as needed.

# Additional resources

## General Overviews of PBR



[NCSL  
Performance-Based  
Regulation:  
Harmonizing  
Electric Utility  
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  
The Nuts and  
Bolts of  
Performance-  
Based  
Regulation](#)

# Questions?



# Discussion

- What elements about the approaches used in these state examples would you like to see Virginia explore further or emulate in this study process?
- What questions are you holding about these case studies that would be informative for Virginia's PBR study process?



**Thank you**

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