



Performance Based Regulation (PBR)

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What is PBR?

- Intended to better emulate the cost efficiency incentives of a competitive industry by decoupling revenue from costs
- Outcome focused
 - Incentivises efficiency
 - Dis-incentivises inefficient outcomes / behaviours
- Makes regulation more efficient over time
- Other names for PBR
 - Incentive Regulation (IR)
 - Revenue Decoupling

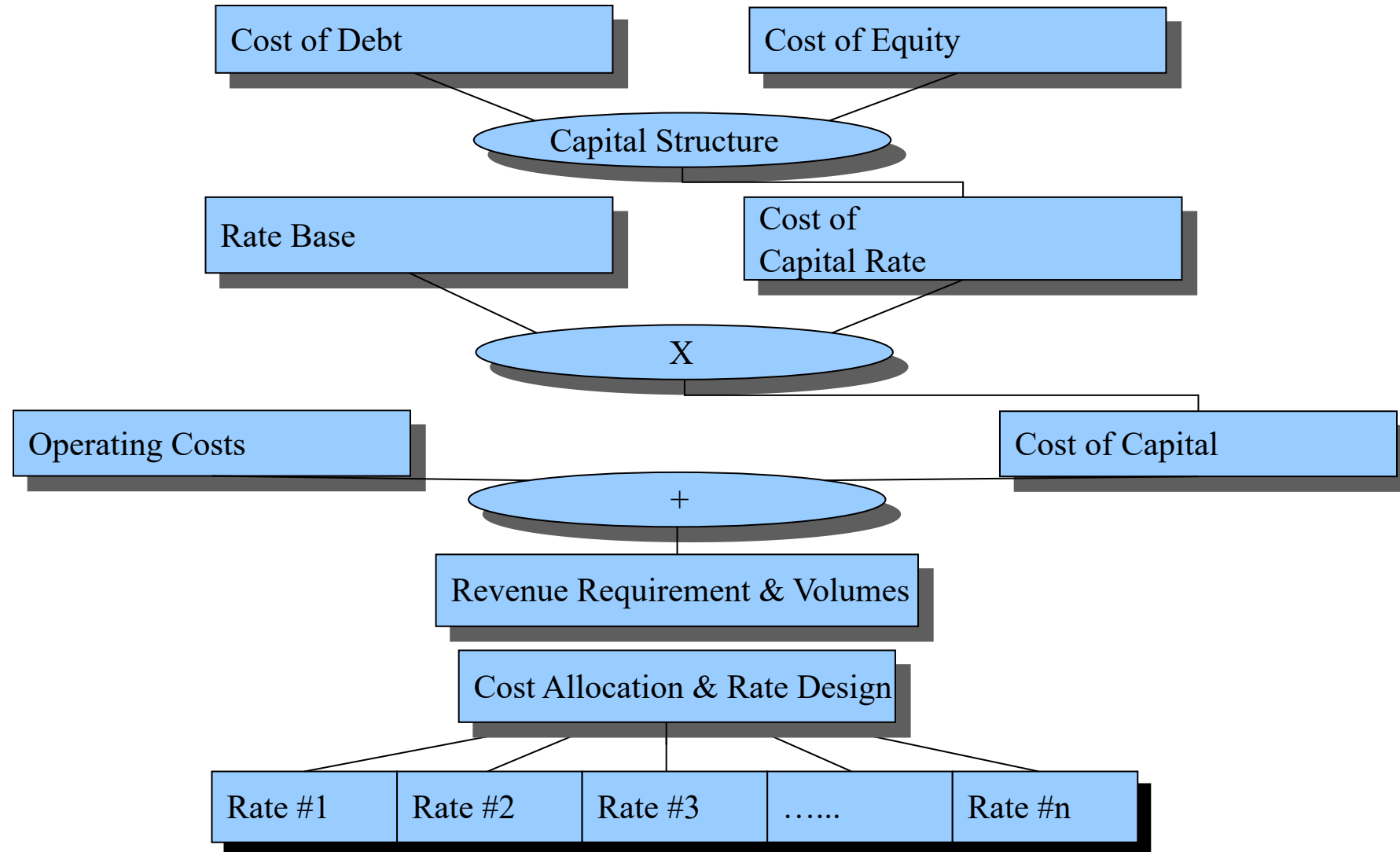
Versus Cost of Service (COS) Regulation

- The most common form of regulation
- Rates are based on costs and quantities:

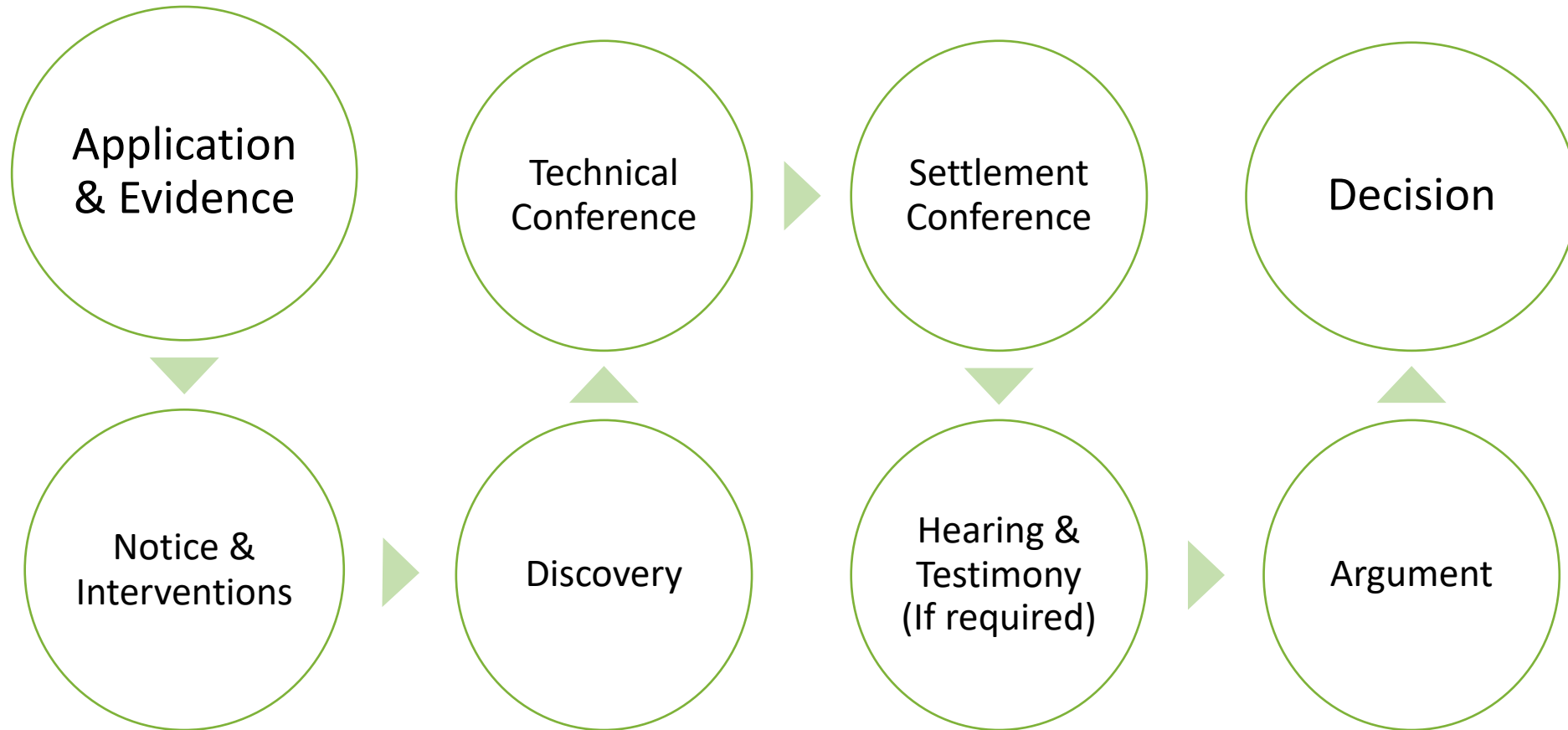
$$Rates_t = \frac{Costs_t}{Quantity_t}$$

- Regulator approves
 - Rate base
 - Return on rate base for the test year
 - COS incents investment in capital assets
 - Other costs required to provide service for the test year
 - Quantity of product distributed
- Typically use a forecast test year
- Dis-incents risk taking (i.e. innovation) and investment in long term efficiencies (due to short COS term years, typically 1 year)

Derivation of Rates in COS



Rate Application Process



Objectives of a Regulator

The [Ontario Energy Board Act, 1998](#) sets out guiding objectives for the Board:

- To facilitate competition in the sale of gas to users.
- To protect the interests of consumers with respect to prices and the reliability and quality of gas service.
- To facilitate rational expansion of transmission and distribution systems.
- To facilitate rational development and safe operation of gas storage.
- To promote energy conservation and energy efficiency in accordance with the policies of the Government of Ontario.
- To facilitate the maintenance of a financially viable gas industry for the transmission, distribution and storage of gas.
- To promote communication within the gas industry and the education of consumers.

Objectives of a Regulator

The [Ontario Energy Board Act, 1998](#) also sets out the Board's powers relating to setting rates:

- [\(3\)](#) In approving or fixing just and reasonable rates, the Board may adopt any method or technique that it considers appropriate. 1998, c. 15, Sched. B, s. 36 (3).

A Brief History of PBR

- Started making in-roads in early 90's
- Recognition that traditional cost of service model requires extensive resources, rate application process, and hearing time
- Desire for increased efficiency, both utility and regulatory efficiency
- Recognition that in some instances full cost of service hearing may not be required
- Price cap PBR mechanism first implemented in the UK in 1990

Objectives of PBR

- De-Link rates from costs - provides incentive for improved efficiency
 - Utility must achieve efficiency improvements to increase income
 - Shareholders allowed to retain cost savings achieved through efficiency improvements or income from other revenue
 - Customers gain through the productivity challenge, and/or
 - Through Re-basing – i.e. new rates based on more efficient cost structure of the utility
- Result in lower costs to utility ratepayers over time
- Provide more flexibility for utility management
- Provide more stable rates; greater rate certainty
- Reduce regulatory process costs

How is PBR Different?

What is Different about PBR?

- No certainty of cost recovery
- Re-focus according to incentives
 - Greater internal scrutiny of budgets, spending, investment decisions, capital rationing
 - IR encourages economic decision making
- Multi year plan – longer risk / incentive horizon

What Remains the Same?

- Maintain safe & reliable system
- Maintain service quality for customers
- Attach new customers

Basic PBR Rate Setting Alternatives

Price Cap:

- Caps growth in allowed rates
- Attractive when volumes increasing
- May result in disincentive to promote conservation

Revenue Cap:

- Caps growth in allowed revenues
- Attractive when not a lot of volume growth
- Reduces disincentive to promote conservation

Basic PBR Formula Design

Price Cap:

$$Rates_t = Rates_{t-1} (1 + I_t - X) + Y_t + Z_t$$

OR

Revenue Cap:

$$Revenue_t = Revenue_{t-1} (1 + I_t - X) + Y_t + Z_t$$

Where,

- t = the year for which rates are being determined
- I = a measure of inflation
- X = a productivity challenge
- Y = cost elements outside of the rate adjustment formula and passed-through at cost of service
- Z = factors outside the control of management which may or may not arise within the plan and passed-through at cost of service

PBR Formula Design: Example

Enbridge Revenue Cap per Customer:

$$Revenue_t = \left[\left(\frac{Revenue_{t-1}}{Customers_{t-1}} \right) (1 + (1 - X)I_t) Customers_t \right] + Y_t + Z_t$$

RR_{2007} = \$772.9 million

(\$424 per Customer)

C_{2007} = 1,823,258

C_{2008} = 1,864,047

I = 2.04%

$I - X$ = 0.6

$Y \text{ \& } Z$ = 0

RR_{2008} = $(772.9 / 1.823258) \times (1 + 0.6 \times 2.04\%) \times 1.864047$

RR_{2008} = \$799.8 million

(\$429 per customer)

PBR Components – *Inflation [I]*

	Advantages	Disadvantages
<u>Macroeconomic Measure</u>	<ul style="list-style-type: none">• Simple• Understandable• Calculated by independent, credible source (Stats Canada)• Publicly available	<ul style="list-style-type: none">• May or may not be entirely relevant to industry experience
<u>Industry-Specific or Company-Specific Measure</u>	<ul style="list-style-type: none">• Directly relevant to industry/company experience	<ul style="list-style-type: none">• Not publicly available• Complicated – difficult to create, interpret, and reproduce• Controversial

PBR Components – *Productivity [X]*

- Typically includes a TFP study to examine the historical productivity performance of the industry
- Important to consider the industry, rather than the subject utility, because the intent is to create competitive-like circumstances
- Evaluates output quantities (volumes, customers) relative to input quantities (labour, materials, capital)
 - If customers, volumes growing fast relative to quantity of inputs, then productivity is improving
- Some programs can drag productivity because they do not increase output, but are essential to the existing outputs
 - Replacement of plant
 - Service quality
 - Integrity / Reliability projects

PBR Components – *Plan Design*

- Plan term – Typically 3-10 years; Longer time between rebasing increases incentives & risk
- Earnings Sharing Mechanisms – Generally, reduces incentives associated with PBR; May be preferred to provide confidence that utilities will not earn run-away profits
- Off ramps – Review may be triggered automatically or by option if certain conditions met
- Performance Measurement / Service Quality Indicators – May identify specific variables to monitor and include reward / penalty mechanisms
- Rebasing terms – Cost of service terms; Conditions for extension; Efficiency carry over mechanism

Ontario PBR Framework

- Three options provided to utilities:
- 1) 4th Gen IR [price cap + ICM] 2) Custom IR 3) Annual IR [price cap]

<u>Plan Components</u>	<u>Treatment of Capital</u>	<u>Planning</u>	<u>Measuring Performance</u>
<ul style="list-style-type: none"> • Minimum of 5-year term • Industry specific inflation factor • X-factors empirically derived industry + stretch factor • For Custom IR, expected inflation and productivity gains will be built into the rate adjustment 	<ul style="list-style-type: none"> • Continuation of ICM in 4GIRM; Custom IR sets out rate path based on planned capital spending plans (No ICM); • Asset management plan a must 	<ul style="list-style-type: none"> • Distributors required to file 5-year capital plans; Board will monitor capital spending against the plan 	<ul style="list-style-type: none"> • Board will develop standards and measures that will link to performance outcomes using a scorecard approach

Ontario PBR Plans – 2nd Generation Gas

Plan	Plan Details
EGD IR 2014-2018	<ul style="list-style-type: none"> • Custom Incentive Regulation <ul style="list-style-type: none"> • 5 years of forecast costs (non-formulaic), certain updates • I = N/A • X = Embedded in forecasts + stretch included by OEB • ESM = 50/50 @ Allowed ROE (normalized) • Y-Factors: N/A • Z-Factors • Off-ramp if Earnings +/- 300 bp of Allowed ROE
Union Gas IR 2014-2018	<ul style="list-style-type: none"> • Price Cap • I = 0.4*Canadian GDPIPI FDD • X = 60% of inflation • ESM = 50/50 @ Allowed ROE + 100bp (un-normalized), 90/10 @ Allowed ROE + 200bp (un-normalized) • Y-Factors: Gas Costs, DSM, Major Capital Projects • Z-Factors • No Off-ramp

Ontario PBR Plans – 3rd Generation Gas

Plan	Plan Details
MAADs Price Cap 2019-2023 (EGI)	<ul style="list-style-type: none"> • Price Cap • Base Rates: 2018 approved rates with minor adjustments • I: GDP IPI FDD • X = 0, Stretch Factor = 0.3%; • ESM: 50/50 above 150bps • Y-Factors: ICM, average use adjustment, gas costs, carbon costs, DSM costs • Z-Factors: Materiality threshold of \$5.5 million • Off-ramp: ±300bps
Custom IR 2019-2023	<ul style="list-style-type: none"> • Base Rates: TBD in multi-year application review, no updates • I: Applicant specific • X: Applicant specific • ESM: Optional • Y-Factors: Not available • Z-Factors: Available • Off-ramp: Optional but expected <p>} Not necessarily formulaic</p>

Other PBR Plans – Various Jurisdictions & Sectors

Plan	Plan Details
Alberta (AUC)	<ul style="list-style-type: none"> • Price Cap (Electrics), Revenue Cap Per Customer (Gas) • I = Composite index comprised of average week earnings and Alberta CPI (55% & 45% respectively) • X = 1.16% for both gas and electric • ECM = Utilities are allowed to carry over up to 0.5% of earnings two years after the end of a PBR term (approved ROE) • Capital Tracker, Y Factor, Z Factor • Off Ramps = 500bp +/- approved ROE in a single year, 300bp over two consecutive years
Toronto Hydro-Electric System Limited (OEB)	<ul style="list-style-type: none"> • Custom IR • Price cap index: $PCI = I - X + C$ • I = Composite index determined by OEB (GDP-IPI-FDD & Average Weekly Earnings) • X = OEB determined productivity stretch factor • C = Reconciliation of capital requirements with PCI framework • ESM = 50/50 @ allowed ROE plus 100bp • Off Ramps = 300 bp +/- approved ROE in a single year

ESM Example: Forecast

FORECAST UTILITY RATE BASE (2014)		
ITEM	DESCRIPTION	\$ M
	Property, Plant & Equipment (PPE)	
1	Gross PPE	\$ 7,104.1
2	Accumulated Depreciation	\$(2,941.1)
3	Net PPE	\$ 4,163.0
	Allowance for Working Capital	
4	Materials and Supplies	\$ 35.1
5	Customer Security Deposits	\$ (65.7)
6	Gas in Storage (Inventory)	\$ 279.9
7	Working Cash Allowance	\$ 9.1
8	Total Working Capital	\$ 258.4
9	Utility Rate Base	\$ 4,421.4
	Utility Rate Base \$4,421.4	Allowed Net Earnings \$149.0
	X 36% X 9.36%	

FORECAST REVENUE REQUIREMENT (2014)		
ITEM	DESCRIPTION	\$ M
1	Gas Supply Plan Costs	\$ 1,456.3
2	Operation & Maintenance	\$ 425.3
3	Depreciation	\$ 248.5
4	Municipal Taxes	\$ 41.2
5	Other Operating Revenues	\$ (42.7)
6	Interest Expense on Debt and Income Tax	\$ 158.9
7	Allowed Net Earnings	\$ 149.0
10	Total Revenue Requirement	\$ 2,436.5

ESM Example: Actual

ACTUAL UTILITY RATE BASE (2014)		
ITEM	DESCRIPTION	\$ M
	Property, Plant & Equipment (PPE)	
1	Gross PPE	\$ 7,216.6
2	Accumulated Depreciation	\$(2,900.8)
3	Net PPE	\$ 4,315.8
	Allowance for Working Capital	
4	Materials and Supplies	\$ 38.2
5	Customer Security Deposits	\$ (61.4)
6	Gas in Storage (Inventory)	\$ 402.7
7	Working Cash Allowance	\$ 6.0
8	Total Working Capital	\$ 385.5
9	Utility Rate Base	\$ 4,701.3
	Utility Rate Base	Allowed Net Earnings
	X 36% X 9.36%	\$158.4
	\$4,701.3	

ACTUAL UTILITY INCOME (2014)		
ITEM	DESCRIPTION	\$ M
	Operating Revenue	
1	Revenue from Rates	\$ 2,640.6
2	Other Revenue	\$ 45.7
3	Total Operating Revenue	\$ 2,686.3
	Cost of Providing Service	
4	Gas Cost	\$(1,644.9)
5	Operation & Maintenance	\$ (408.0)
6	Depreciation	\$ (255.9)
7	Municipal Taxes	\$ (40.5)
8	Interest Expense on Debt and Income Tax	\$ (160.0)
9	Total Cost	\$(2,509.3)
10	Utility Net Earnings	\$ 177.0
	Earnings > Allowed Earnings by \$18.6 (after tax) (\$177.0 - \$158.4)	Earnings > Allowed Earnings by \$25.3 (before tax)
	→ Customers \$12.6	→ Company \$12.6

PBR Conclusions

- PBR is here to stay...
- Utilities are concerned about the growth rate of capital spending requirements driven by:
 - Aging assets
 - Industry safety & integrity issues and legislation
- Experience has been good to date, but will it continue?; Will IR evolve further with changing circumstances and stakeholder needs?
- The goal remains → find ways to make regulation and operations more efficient

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