



REVENUE REQUIREMENTS

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Revenue Requirement

- The revenue required to be recovered from customers for the Cost of Service
- The revenue that a regulated utility needs to earn in a test year in order to provide adequate service to its customers and a fair return for its shareholders
- Explain and demonstrate the calculation of Revenue Requirement for the Cost of Service Form of Regulation



Revenue Requirement

Presentation Overview

- Introduction
- Generally Accepted Regulatory Principles
- Cost of Service of a Regulated Utility
- Revenue Requirement Example
 - Rate Base
 - Cost of Capital and Return of Equity (ROE)
 - Cost of Gas Sold
 - Operating, Maintenance and Administration Expense
 - Depreciation and Amortization Expense
 - Revenue Forecast
 - Income Tax
- Regulator's Decision





GENERALLY ACCEPTED REGULATORY PRINCIPLES (GARP)



Generally Accepted Regulatory Principles

1923 Bluefield Waterworks Decision

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money for the proper discharge of its duties.



Generally Accepted Regulatory Principles (GARP)

- Rates based on reasonable costs prudently incurred in providing necessary service to ratepayers
- Annual rates are based on annual costs
- All costs including taxes are on a utility stand-alone basis
- Utility evidence is presented from ratepayer perspective
- Fairness to ratepayers and shareholders

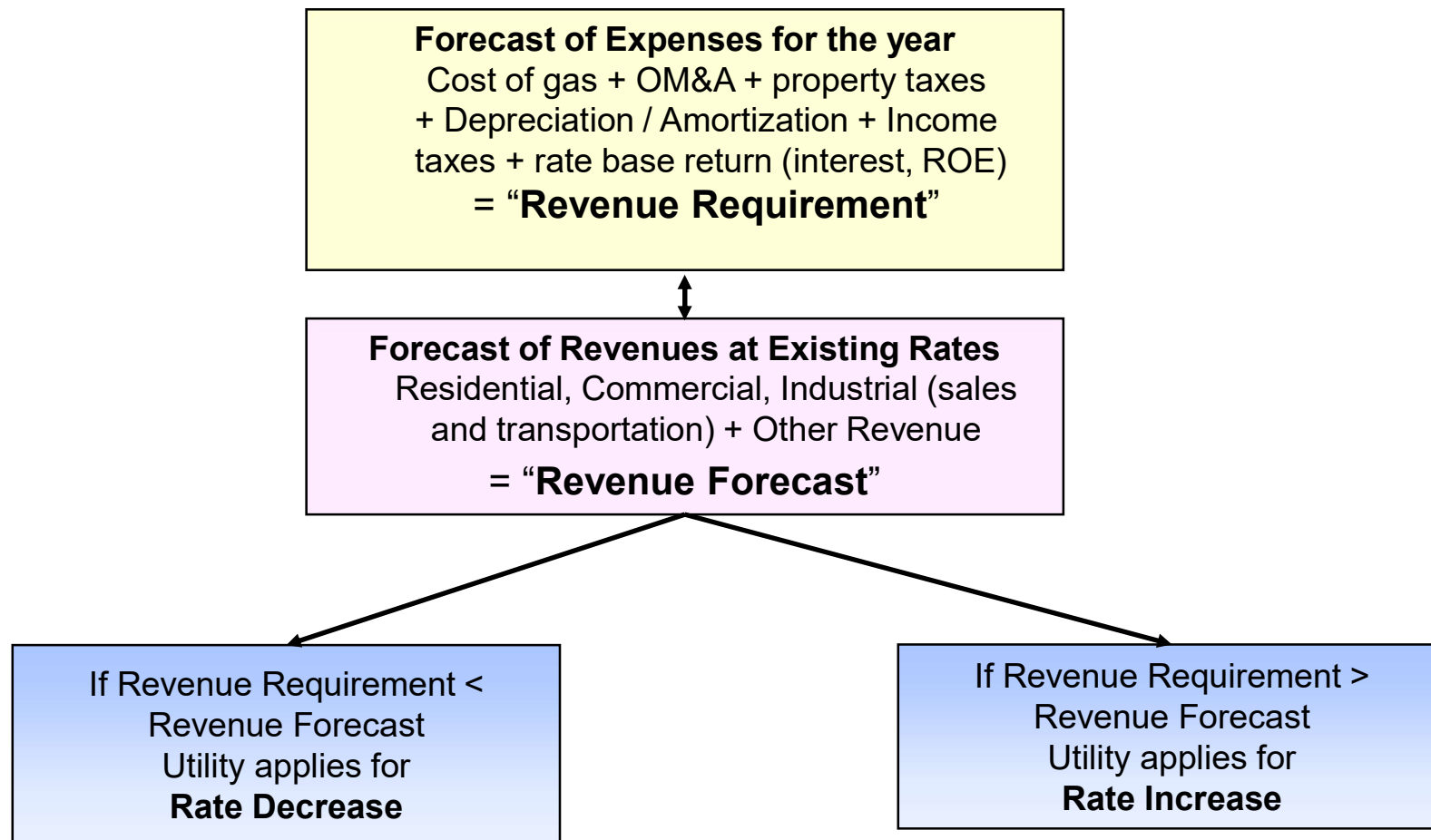




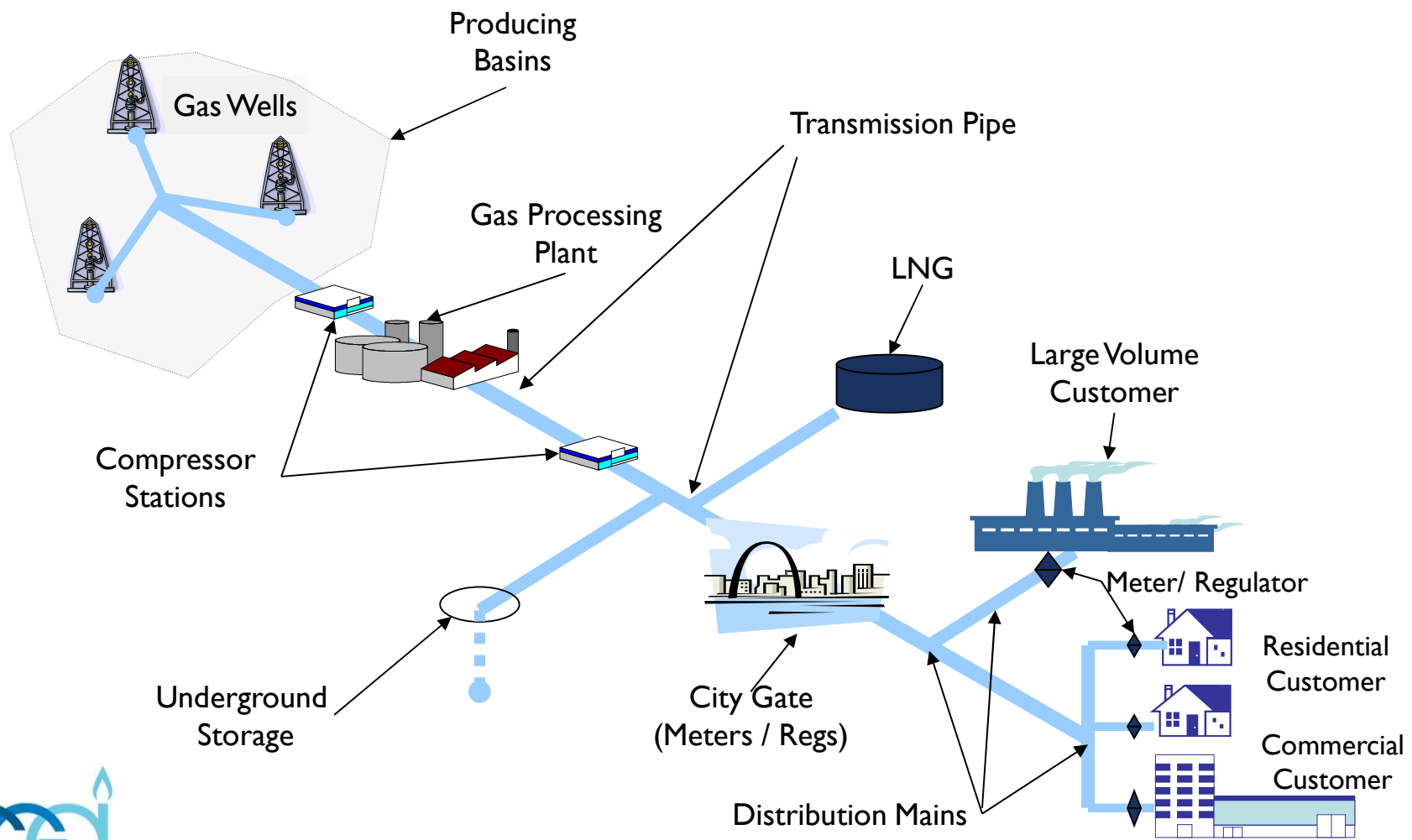
COST OF SERVICE OF A REGULATED UTILITY



COST OF SERVICE / RATE OF RETURN REGULATION



Natural Gas Industry Schematic



Cost or Value

Who determines the price?

- The provider - Cost based

- Price determined by the cost incurred by the provider of the product or a service and not by the price the purchasers are willing to pay.

- The purchaser - Value based (market value)


- Price based on what purchasers are willing to pay.
- Purchasers make decisions by comparing prices of similar products or services offered by other competing providers.
- In a perfectly competitive market, the cost-based price of the most efficient producer will set the market price. Less efficient producers must meet this price to stay in business; an incentive to be efficient.



Top Down vs. Bottom up


Competitive Business

Revenue
- Cost of Goods Sold
- Operating expenses
- Depreciation
- Interest
- Taxes
= Net income



Regulated Utility

= Revenue Requirement
+ Cost of Energy
+ OM&A
+ Depreciation
+ Interest
+ Taxes
Net income (ROE)



Revenue Requirement Formula

$$RR = G + OMA + D + T + r(RB)$$

- RR = revenue requirement
- G = cost of gas sold
- OMA = operating, maintenance and administration expense
- D = depreciation and amortization expense
- T = income tax expense
- $r(RB)$ = Earned Return (Interest and ROE), i.e. return on rate base
- RB = rate base = $(OC - AD)$
- OC = original cost of assets when placed in service
- AD = accumulated depreciation on assets since placed in service
- $G + OMA + D + T$ is sometimes referred to as “cost of service” while others refer to revenue requirement as “cost of service”





REVENUE REQUIREMENT EXAMPLE

FORTISBC ENERGY INC. (FEI)


2019 TEST YEAR



Top Down vs. Bottom up

Regulated Utility

= Revenue Requirement
+ Cost of Energy
+ OM&A
+ Depreciation
+ Interest
+ Taxes
Net income (ROE)



$$RR = G + OMA + D + T + r(RB)$$

RR = revenue requirement

G = cost of gas sold

OMA = operating, maintenance and administration expense

OR = Other Revenue

D = depreciation and amortization expense

T = income tax expense

r(RB) = Earned Return (ROE & Interest)





RATE BASE

“...THE VALUE OF THE PROPERTY WHICH
[THE UTILITY] EMPLOYS FOR THE
CONVENIENCE OF THE PUBLIC...”



Revenue Requirement Example

Test Year Return on Rate Base – FEI 2019

Type of Capital	2019 Capital Structure				
	Amount (\$ Millions)	Portion of Rate Base	Allowed Return	Return Component	Return Amount
+ Long Term Debt (Bonds, Debentures)	\$2,619.9	58.33%	5.18%	3.02%	\$135.7
+ Short Term Debt (Bank loans, Credit Lines)	\$142.4	3.17%	3.10%	0.10%	\$4.4
+ Preferred Shares	\$0.0	0.00%	0.00%	0.00%	\$0.0
+ Common Equity	\$1,729.2	38.50%	8.75%	3.37%	\$151.3
= Total Capital Structure (Amount Financed)	\$4,491.5	100%		6.49%	\$291.4
↕				↑	
= Total Rate Base	\$4,491.5			Return on Rate Base	

Revenue Requirement Example

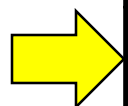
Test Year Rate Base – FEI 2019


2019 Rate Base (\$ Millions)

+ Opening Gas Plant in Service	6,258.0	}	<i>Net Plant In Service</i> 4,195.5
+ Plant Additions/Retirements (Mid-Year)	354.4		
- Accumulated Depreciation (Mid-Year)	(2,144.7)		
- Contributions in Aid of Construction	(272.1)		
+ Unamortized Deferred Charges	(52.1)	}	<i>Working Capital & Other</i> 348.1
+ Working Capital (Gas in Storage)	35.9		
+ Work In Progress (no AFUDC) and Misc	312.2		
= Total Rate Base	\$4,491.5		

Rate Base

Components and Categories



Rate Base Components	\$ Millions	Account Categories
Property, Plant and Equipment (forecast average, net of CIAC, net of accumulated depreciation- net gas plant in service)	\$4,195.5	Storage Plant Transmission Plant Distribution Plant General Plant
Allowance for Working Capital & Other (forecast for the Test Year)	348.1	Gas-in-storage Materials & Supplies Inventory Security Deposits Cash Working Capital Work In Progress (No AFUDC)
Deferred Charges (Regulatory Assets & Liabilities)	<u>(52.1)</u>	Energy Cost Variance Accounts DSM incentives Non-Controllable Cost Variances Application Costs Accounting Related
Total Rate Base (total average Test Year assets providing service to ratepayers)	\$4,491.5	To Cost of Service 



Rate Base – Storage Plant

Liquefied Natural Gas (LNG) Facility

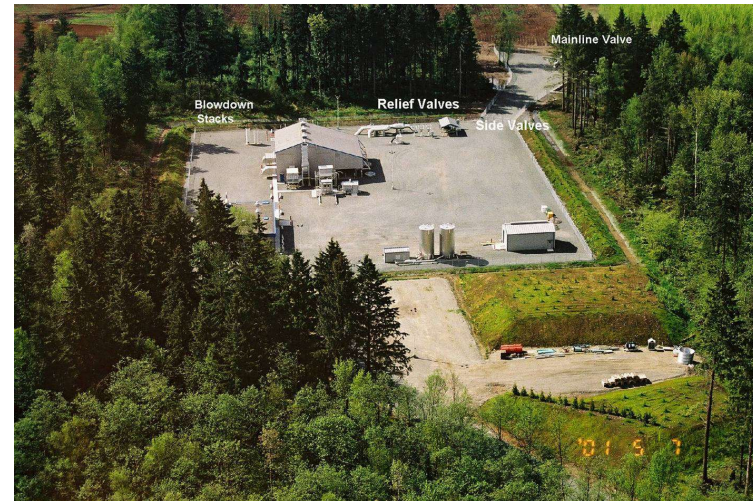


Rate Base – Transmission Plant

Southern Crossing Pipeline

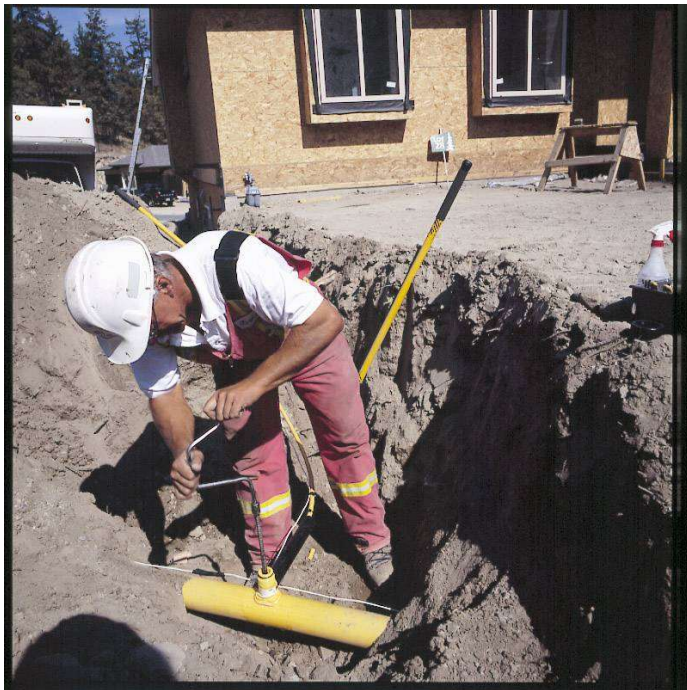


Compressor Station



Rate Base – Distribution Plant

Service Line Tie-in to Main



Meter Installation



Rate Base – General Plant

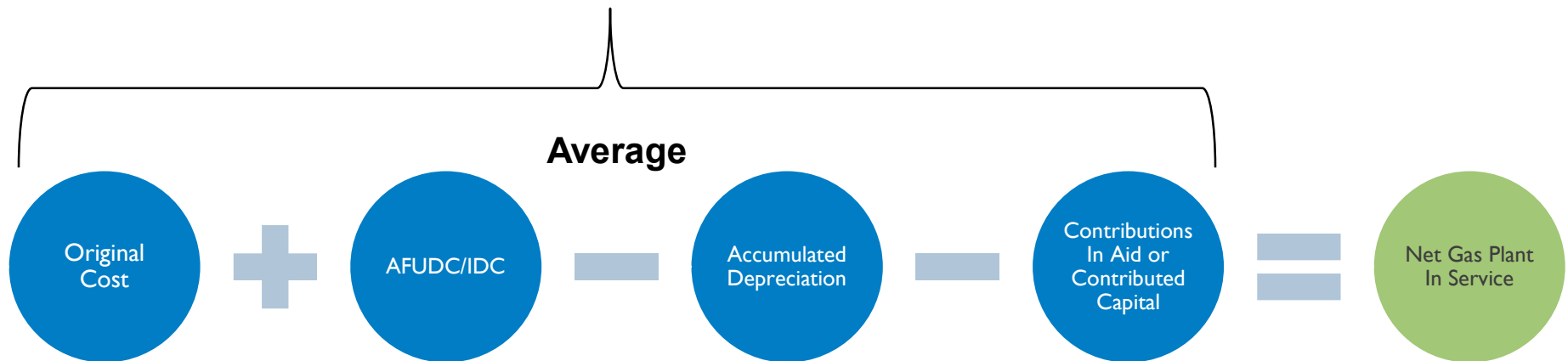
Operations Centre / Office Building



Rate Base

Calculation Principles

Rate base - the net value of utility's assets used in providing service to customers



Generally Accepted Regulatory Principles CIAC, AFUDC and IDC

- **CIAC: Contribution-in-aid-of-Construction**
 - Funds contributed by a customer toward a capital project
- **AFUDC: Allowance for Funds Used During Construction**
 - a charge permitted by the regulator to cover the financing of a utility capital project while under construction
 - AFUDC is based on approved cost of capital (i.e. it has debt and equity components)
 - AFUDC added to the project capital cost on completion
- **IDC: Interest During Construction**
 - Like AFUDC only based on debt interest costs only



Rate Base

Regulatory Treatment of AFUDC/IDC

Work-in-progress
("WIP") is not in rate
base (if AFUDC or
IDC is charged)

Allowed to charge AFUDC or
IDC to recover capital project
financing costs

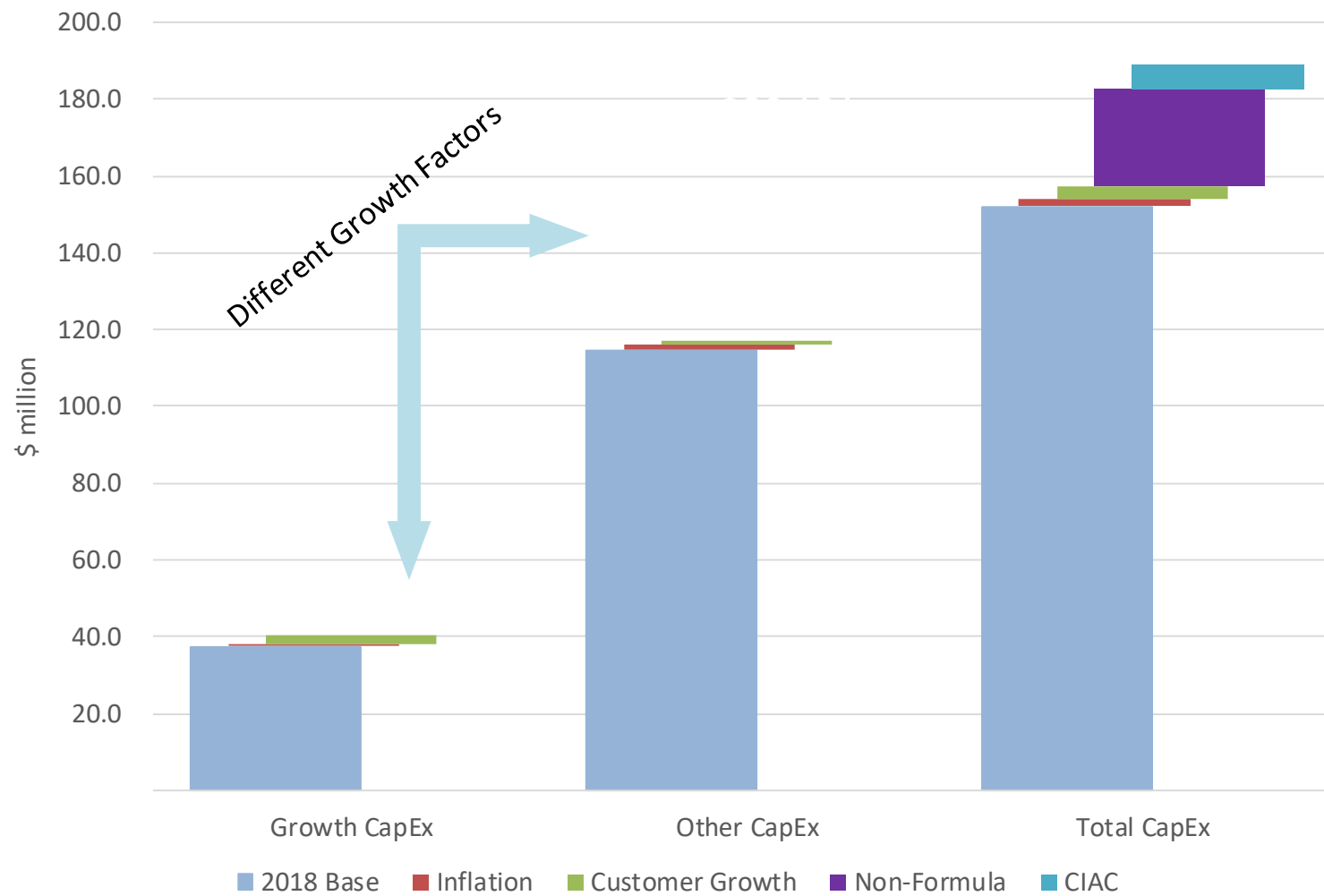
AFUDC or IDC is
added to asset cost

AFUDC or IDC is recovered
through depreciation expense
charged in rates over the life
of the asset



Rate Base

Formula Based Capital Expenditures



Rate Base

Original Cost- Capital Budget vs. Rate Base Additions

Line No.	Particulars	2019 Formula
	(1)	(2)
1	CAPEX	
2		
3	Growth Capital Expenditures	\$ 40,143
4	Sustainment Capital Expenditures	117,116
5	Forecast Capital Expenditures	25,210
6	CIAC (Net of System Extension Fund)	6,812
7	Total Capital Expenditures	<u>\$ 189,281</u>
8		
9	Special Projects and CPCN's	
10		
11	LMIPSU	\$ 171,642
12	Total Capital Expenditures	<u>\$ 171,642</u>
13		
14	Total Capital Expenditures	<u>\$ 360,923</u>

Formula
Driven



Rate Base

Original Cost + AFUDC- Capital Budget vs. Rate Base Additions

Line No.	Particulars	2019 Formula
	(1)	(2)
17	RECONCILIATION OF CAPITAL EXPENDITURES TO PLANT	
18		
19	Regular Capital Expenditures	\$ 189,281
20	Add - Capitalized Overheads	33,738
21	Add - AFUDC	2,912
22	Gross Capital Expenditures	225,931
23	Change in Work in Progress	(11,713)
24	Total Regular Additions to Plant	\$ 214,218
25		
26	Special Projects and CPCN's Capital Expenditure	\$ 171,642
27	Add - AFUDC	15,258
28	Gross Capital Expenditures	186,900
29	Change in Work in Progress	352,931
30	Total Special Projects and CPCN Additions to	\$ 539,831
31		
32	Grand Total Additions to Plant	\$ 754,049

From O&M

Rate Base



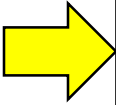
Rate Base

Total Plant Additions, including Retirements

	2019 Rate Base (\$ Millions)	
+ Opening Gas Plant in Service	6,258.0	
+ Plant Additions/Retirements (Mid-Year)	354.4	
- Accumulated Depreciation (Mid-Year)	(2,144.7)	
- Contributions in Aid of Construction	(272.1)	
= Total Rate Base	\$4,195.5	
	CPCN	539.8
	Additions	214.2
	Retirements	(45.3)
	Total Plant Additions	708.7
	Mid-year (Total/2)	354.4



Rate Base Components and Categories (2)

Rate Base Components	\$ Millions	Account Categories
Property, Plant and Equipment (forecast average, net of CIAC, net of accumulated depreciation- net gas plant in service)	\$4,195.5	Storage Plant Transmission Plant Distribution Plant General Plant
 Allowance for Working Capital & Other (forecast for the Test Year)	348.1	Gas-in-storage Materials & Supplies Inventory Security Deposits Cash Working Capital Work In Progress (No AFUDC)
Deferred Charges (Regulatory Assets & Liabilities)	<u>(52.1)</u>	Energy Cost Variance Accounts DSM incentives Non-Controllable Cost Variances Application Costs Accounting Related
Total Rate Base (total average Test Year assets providing service to ratepayers)	\$4,491.5	



Revenue Requirement Example

Test Year Rate Base – FEI 2019

	2019 Rate Base (\$ Millions)	
+ Opening Gas Plant in Service	6,258.0	<div> <i>Net Plant In Service</i> 4,195.5 </div>
+ Plant Additions/Retirements (Mid-Year)	354.4	
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+ Working Capital (Gas in Storage)	35.9	
+ Work In Progress (no AFUDC) and Misc	312.2	
= Total Rate Base	\$4,491.5	

Rate Base

Working Capital Calculation

Accounts for the net financing costs associated with day to day operations

Determined on an annual average basis

- Different from financial statements, which is at a point in time (Current Assets – Current Liabilities)

Cash working capital

- Allowance for timing of cash inflows & outflows
- Lead Lag Study (most common)
- Varies amongst utilities

Other Working Capital

- Primarily gas in storage
- Determined using forecast balances of gas in storage and forecast forward prices



Rate Base

Working Capital Allowance

Line No.	Particulars	2019 Forecast
	(1)	(3)
1	Cash Working Capital	
2	Cash Working Capital	\$ 17,538
3		
4	Less: Funds Available	
5	Reserve for bad debts	(5,510)
6	Employee Withholdings	(6,118)
7		
8	Other Working Capital Items	
9	Transmission Line Pack Gas	89
10	Gas In Storage	28,998
11	Inventory - Materials and Supplied	1,514
12	Refundable Contributions	(577)
13		
14	Total	<u>\$ 35,934</u>

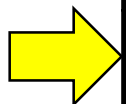
Lead Lag Study

13 Month Average



Rate Base Components and Categories (3)

Rate Base Components	\$ Millions	Account Categories
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Rate Base

Deferred Charges (Regulatory Assets & Liabilities)

- Common examples of deferral accounts are in the following areas:
 - Cost of Gas – Purchased Gas Variance Account or PGVA
 - Taxes - Income or property tax changes not anticipated in the test year
 - Interest rates
 - Demand Side Management incentive grants
 - Natural Gas for Transportation Incentives
 - Extraordinary losses caused by disasters and other unusual circumstances

- Rate base treatment of deferral accounts varies by jurisdiction

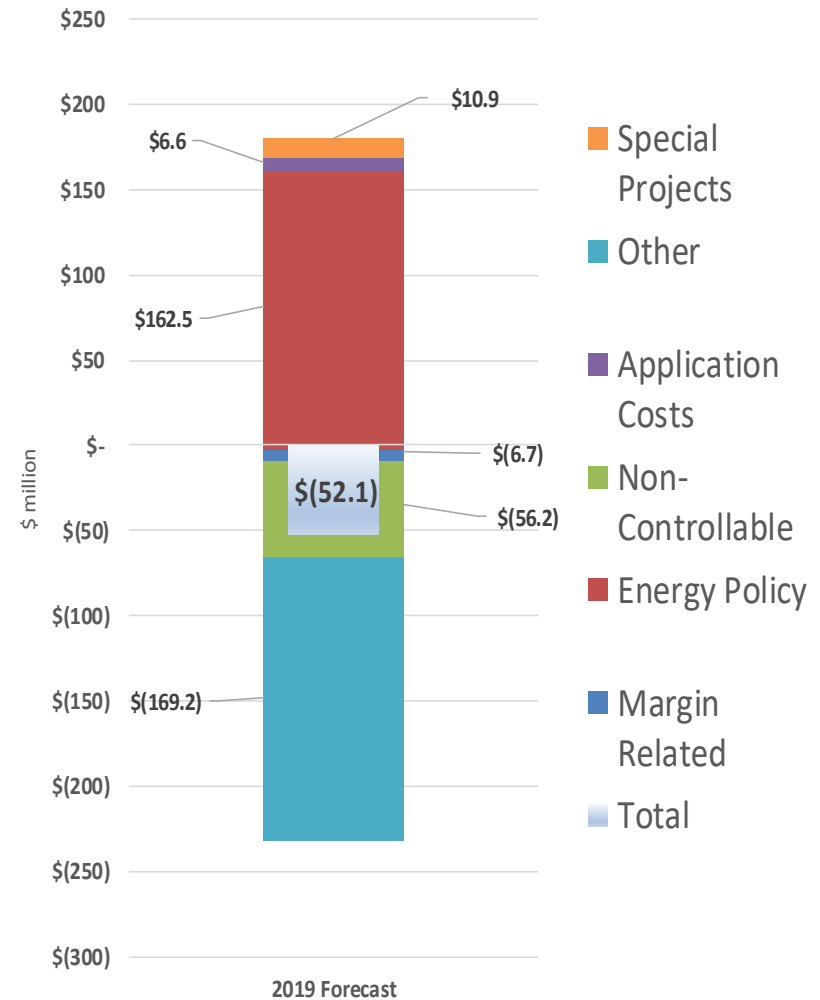


Rate Base

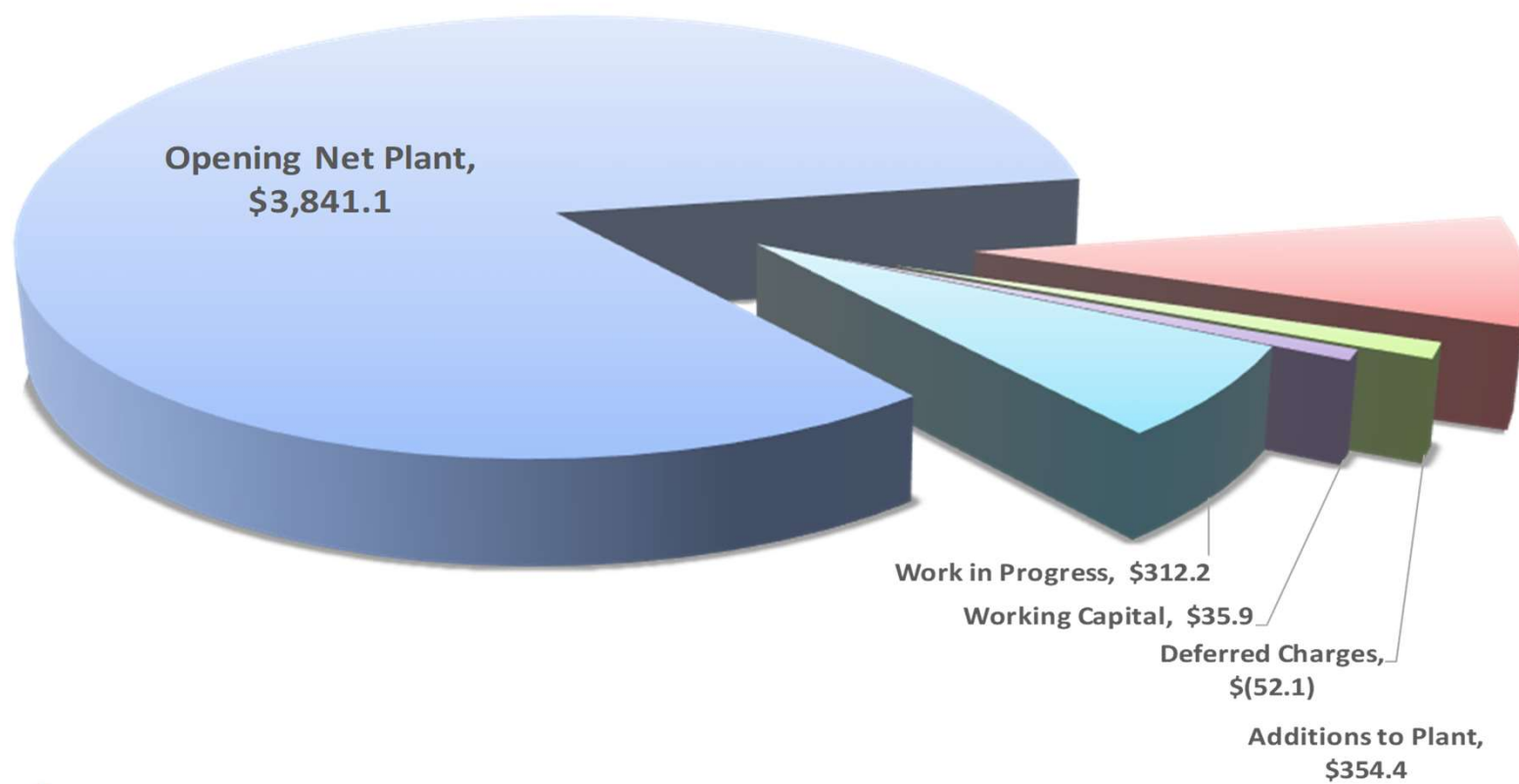
Deferred Charges (Regulatory Assets & Liabilities), \$ Millions

Accounts categorized as follows in FEL:

- **Margin Related**
 - Variance accounts for Energy & Use Rates
- **Energy Policy**
 - EEC/DSM incentives
 - NGT programs
- **Non-Controllable**
 - Cost variances and unanticipated events (tax changes, actuarial estimates, etc.)
- **Application Costs**
- **Other**
 - Accounting related, special projects




Rate Base Summary, \$ Millions





COST OF CAPITAL AND EARNED RETURN

“...A RETURN ... EQUAL TO THAT GENERALLY BEING MADE AT THE SAME TIME... ON INVESTMENTS IN OTHER BUSINESS UNDERTAKINGS WHICH ARE ATTENDED BY CORRESPONDING RISKS AND UNCERTAINTIES. THE RETURN SHOULD BE REASONABLY SUFFICIENT TO ASSURE CONFIDENCE IN THE FINANCIAL SOUNDNESS OF THE UTILITY ... TO MAINTAIN AND SUPPORT ITS CREDIT AND ENABLE IT TO RAISE THE MONEY FOR THE PROPER DISCHARGE OF ITS DUTIES.”



Cost of Capital

Test Year Return on Rate Base – FEI 2019

Type of Capital	2019 Capital Structure				
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+ Preferred Shares	\$0.0	0.00%	0.00%	0.00%	\$0.0
+ Common Equity	\$1,729.2	38.50%	8.75%	3.37%	\$151.3
= Total Capital Structure (Amount Financed)	\$4,491.5	100%		6.49%	\$291.4
↕					
= Total Rate Base	\$4,491.5			Return on Rate Base	

Cost of Capital

Components of Capital Structure

Long Term Debt

- Amounts are averages of existing and forecast amounts
- Net of un-amortized finance charges and profit/loss on redemption
- Existing debt and preference capital – at actual rates
- New debt and preference capital – at forecast rates from economic forecast

Short Term Debt

- Short term debt amount is the amount required to balance rate base – actual and forecast amounts of short term debt are not used
- Rate is obtained from the economic forecast of rates on a monthly basis for the test year

Common Equity

- The amount is usually deemed by the regulator based on the risk of the utility's business – actual common equity is not used
- The utility requests approval of a return on equity ("ROE") for the test year based on evidence of economists
- In some jurisdictions a formula is used to determine the allowed ROE



Revenue Requirement Equation

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = G + OMA + D + T + (6.49\% \times \$4,491.5)$$

$$RR = G + OMA + D + T + 291.4$$





COST OF GAS SOLD



Cost of Gas

Commodity-related costs receive different treatment from the cost of service of delivery-related cost components

- Natural gas pricing is market-based.
- Commodity options available – customer can select marketer or default utility options.


Commodity rate changes handled on a “flow-through” basis

- Two commodity-related cost streams for FortisBC- commodity and mid-stream

Deferral accounts common to capture commodity cost variances



Sample Customer Bill


FORTIS BC™

Name: [REDACTED]

Service address: [REDACTED]

Rate class: [REDACTED]

Billing date: [REDACTED]

Account number	Due date	Amount due
[REDACTED]	Dec 18, 2012	\$117.18

Previous bill 54.68

Less payment - Thank you 54.68CR

Balance from previous bill 0.00

Delivery Charges

Basic charge (32 days at 0.3890 per day) 12.45

Delivery (10.8 GJ at 3.375 per GJ) 36.45

48.90**

Commodity Charges

Midstream (10.8 GJ at 1.339 per GJ) 14.46

Cost of Gas (10.8 GJ at 2.977 per GJ) 32.15

46.61**

Other Charges and taxes

Carbon Tax (10.8 GJ at 1.4898 per GJ) 16.09**

HST (12% of * amounts) 13.39

Residential Energy Credit (7% of * amounts) 7.81CR

Please do not pay - Will be withdrawn automatically **117.18**

Winter meter safety Remove any built-up snow by hand. If it builds up on your meter



Revenue Requirement Equation

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = 369.3 + OMA + D + T + 291.4$$





OPERATING, MAINTENANCE AND ADMINISTRATION EXPENSE

“...UNDER EFFICIENT AND ECONOMICAL
MANAGEMENT...”



Operating, Maintenance and Administration Expense

OM&A Categories

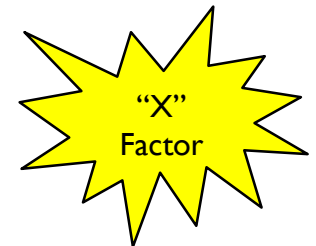
OM&A	Account Categories
Plant Operating and Maintenance	Storage Plant O&M Transmission O&M Distribution O&M General Plant O&M
Customer Care and Marketing	Meter reading Customer Billing & Administration Call centre Bad debt & Credit Management Program marketing, e.g. DSM
Administration	Finance & General Administration Legal Insurance Employee Benefits



2019 Revenue Requirements

Formula Based O&M Expense (\$000)

<u>Line</u>	<u>Description</u>	<u>\$ million</u>
1	2018 Base O&M	\$ 243.6
2	x (1 + Net Inflation)	1.411%
3	x (1 + Net Growth Factor)	0.776%
4	2016 Formula O&M	\$ 248.9
5	Forecast O&M	32.2
6	Total Gross O&M	\$ 281.1
7	Capitalized Overhead (12%)	(33.7)
8	Biomethane O&M Transferred	(1.3)
9		
10	Net O&M	\$ 246.1



OM&A Expense

Affiliate Transactions Concerns

- Assets or services
 - Purchased or obtained by the utility from parent company or affiliates
 - Sold or transferred by the utility to the parent company or affiliates
- Concerns Regarding Affiliate Transactions
 - Transfer of utility earnings, which could have been used to reduce rates, to unregulated affiliate or parent company
 - Purchases by utility from affiliate at more than utility's avoided cost or above market value
 - Sales by utility to affiliate below book value of assets, or below cost of production, or below market value
- Two arguments
 - “No harm to ratepayers test” : transaction must not increase rates
 - “Benefit to ratepayers test” : transaction must decrease rates or yield other benefits

OM&A Expense

Property Taxes

- Taxing authority granted to various municipal, provincial and other public bodies by statute and regulation.
- Property taxes are generally based on assessed property values and mill rates but in some cases there are revenue-based taxes
- Utility property tax rates tend to be among the highest




Revenue Requirement Equation

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = 369.3 + (246.1 + 67.6) + D + T + 291.4$$





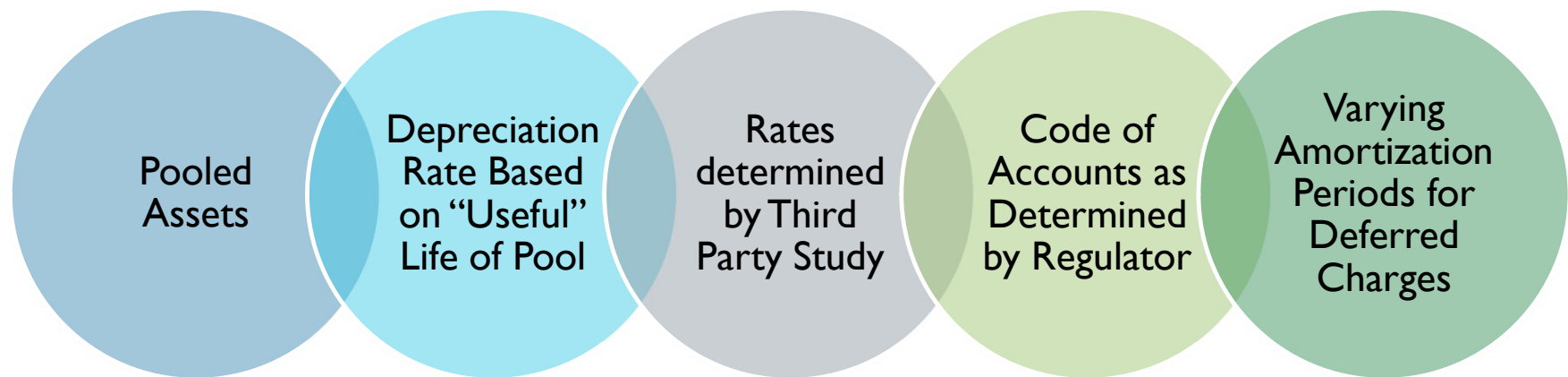
Depreciation and Amortization Expense

“...THE VALUE OF THE PROPERTY WHICH [THE
UTILITY] EMPLOYS FOR THE CONVENIENCE
OF THE PUBLIC...”



Depreciation and Amortization Expense

General Concepts



Depreciation and Amortization Expense

General Calculation of Depreciation Expense



Depreciation and Amortization Expense

Net Mains Cost in Rate Base

	Opening Balance \$ millions	Additions \$ millions	Retirements** \$ millions	Retirement Costs \$ millions	Closing Balance \$ millions
Gross Plant	1,499	32	(2)	-	1,530
Accumulated Depreciation*	(484)	(23)	2	-	(505)
Net Plant	1,015	9	-	-	1,025

* Accumulated depreciation additions are the annual depreciation expense, based on opening balance of plant

**Note that ordinary retirements do not change rate base



Depreciation and Amortization Expense

Distribution Plant

	Gross Plant Balance \$ millions	Depreciation Rate %	Depreciation Expense \$ millions
Land	4	0%	-
Services	1,217	2.45%	29.8
Mains	1,499	1.54%	23.1
Meters	280	7.09%	19.8
Other	585		24.3
Total	3,585		97.0

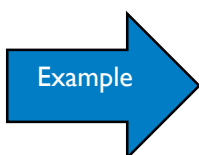
Example



Depreciation and Amortization Expense

Test Year Depreciation and Amortization Expense

Depreciation & Amortization Expense \$ millions



Storage Plant	20.2
Transmission Plant	34.7
Distribution Plant	97.0
General Plant	25.0
BIO Gas	0.6
Natural Gas for Transportation	1.8
Other	19.9
Total Depreciation Expense	199.3
Amortization of CIAC	(9.0)
Amortization of Deferred Charges	40.6
Total	231.0



Depreciation and Amortization Expense

Asset Retirement

Ordinary Retirements

- Plant is retired near the end of its economic life
- No change in rate base
- Depreciation expense is reduced

Extraordinary Retirements

- Plant is retired prematurely due to external events beyond management control
- Rate base is reduced by the net book value of the retired plant
- Depreciation expense is reduced
- Loss on retirement (net book value + disposal cost – salvage value) is recovered from ratepayers in the year incurred (or can be amortized over several years to mitigate rate impacts)



Revenue Requirement Equation

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = 369.3 + (246.1 + 67.6) + 231.0 + T + 291.4$$





INCOME TAX



Income Tax

Utility Tax Calculation Principles

- Income tax is calculated on utility stand-alone basis, as if the regulated utility was a separate taxable corporation
- Regulators require that taxes be calculated on flow-through basis - current customers benefit from maximum current tax deductions.
 - Results in un-recorded deferred taxes to recover from future customers
 - Issue of inter-generational cross-subsidies - current customers are benefiting from CCA tax deductions that should belong to future customers



Income Tax

Utility Tax Calculation Approach

Forecast Revenue @ Existing Rates

Forecast Demand x Existing Rates



Income @ Existing Rates before Interest & Income Tax

Forecast Revenue @ Existing Rates – Forecast Expenses



Taxable Income

Income before Interest and Income Tax +/- Non-deductible or Deductible



Income Tax @ Existing Rate

Taxable Income x Tax Rate



Test Year Income Tax @ Proposed Rate

Gross Revenue Deficiency / (1 – Tax Rate) x Tax Rate



Revenue Forecast

“...UNDER EFFICIENT AND ECONOMICAL
MANAGEMENT...”



Revenue Forecast

Use per Customer (UPC) Rates



- Use rate forecast x number of customers (per rate schedule) to get forecast demand
- Decline in use per customer creates rate challenges as the addition of new customers is currently not great enough to offset



Revenue Forecast

Forecast Volumes and Margin

	2019 Forecast Volume TJ	2019 Forecast Revenue @ Existing Rate \$ millions	2019 Forecast Margin @ Existing Rate \$ millions
Residential (RS 1)	80,768	704.4	491.8
Commercial (RS 2, 3, 23)	61,314	373.8	239.0
Industrial (RS 4-7, 22, 25, 27)	59,491	91.2	83.3
Bypass and Special Rates	33,810	35.3	30.0
Subtotal	235,383	1,204.8	844.2
Other Revenue		44.9	44.9
Total (Include Other Revenue)		1,249.7	889.1



Revenue Forecast

Regulation of Other Revenue

- What is other revenue?
 - Other revenue is generally utility revenue which is not rate regulated, i.e. its rates are not set by an order of the regulator
 - Utility assets and employees are used to generate other revenue
 - Examples: NGT stations; rentals and service; agent billing and collection service, transactional services
- How is it regulated?
 - Utility may need to demonstrate that the rate of return (ROR) on utility assets used for other revenue is equal to or greater than the allowed base allowed by the regulator
 - If ROR is less than the allowed, then the regulator may impute revenue to this business to bring it up to the allowed ROR
 - Imputed revenue is a notional increase in other revenue which is not earned by the utility and reduces the allowed rate increase



Income Tax Calculation

\$millions

Forecast Revenue @ Existing Rates

Forecast Demand x Existing Rates

\$ 1,249.7

Income @ Existing Rates before Interest & Income Tax

Forecast Revenue @ Existing Rates – Forecast Expenses

Taxable Income

Income before Interest and Income Tax +/- Non-deductible or Deductible

Income Tax @ Existing Rate

Taxable Income x Tax Rate

Test Year Income Tax @ Proposed Rate

Gross Revenue Deficiency / (1 – Tax Rate) x Tax Rate

Income Tax

Utility Income Before Interest and Income Tax

	\$ millions	\$ millions
Total Revenue @ Existing Rates		\$ 1,249.7
Less Expenses:		
Cost of Gas Sold	\$ (369.3)	
OM&A Expense	(246.1)	
Property Tax	(67.6)	
Depreciation and Amortization Expense	<u>(231.0)</u>	
Total Expenses		<u>(913.9)</u>
Income before Interest & Income Tax		\$ 335.8



Income Tax

Taxable Income

	\$ millions
Income before Interest and Income Tax	\$ 335.8
Deduct: Interest Expense	(140.1)
Add Non-deductible Items:	
Depreciation / Amortization Expense	231.0
Other Non-deductible Items	22.1
Subtract Deductible Items:	
Capital Cost Allowance (tax depreciation)	(214.2)
Capitalized Deductible Items (overhead costs)	(11.2)
Grossed-up Part VI.1 Tax (re: Preferred Shares)	
Other Deductible Items	(35.6)
Taxable Income	187.6

Income Tax

Income Tax on Forecast Revenue at Existing Rates

	Combined Federal & Provincial \$ millions	
Taxable Income	\$	187.6
Income Tax Rate		27%
Income Tax on Revenues at Existing Rates	\$	50.7



Income Tax

Test Year Income Tax on Revenues at Proposed Rates

	\$ millions	\$ millions
Cost of Capital r(RB)	\$ 291.4	
Expenses before Income Tax G+OMA+D	913.9	
Income Tax at Existing Rates	50.7	50.7
Subtotal	1,256.0	
Less: Revenue at Existing Rates	1,249.7	
Net Revenue Deficiency	6.3	
Gross Revenue Deficiency =	8.7	
Net deficiency/ (1-marginal tax rate) = $6.3 / (1 - 0.27)$		
Income Tax on Gross Revenue Deficiency (8.7×0.27)		2.3
Test Year Income Tax at Proposed Rates		53.0



Income Tax Calculation

\$millions

Forecast Revenue @ Existing Rates

Forecast Demand x Existing Rates

\$ 1,249.7

Income @ Existing Rates before Interest & Income Tax

Forecast Revenue @ Existing Rates – Forecast Expenses

\$ 335.8

Taxable Income

Income before Interest and Income Tax +/- Non-deductible or Deductible

\$ 187.6

Income Tax @ Existing Rate

Taxable Income x Tax Rate

\$ 50.7

Test Year Income Tax @ Proposed Rate

Gross Revenue Deficiency / (1 – Tax Rate) x Tax Rate

\$ 53.0



Revenue Requirement Equation

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = 369.3 + (246.1 + 67.6) + 231.0 + 53.0 + 291.4$$

$$RR = 1,258.4$$



Revenue Requirement and Rate Increase Summary

(\$millions)

$$RR = G + OMA + D + T + r(RB)$$

$$RR = 369.3 + (246.1 + 67.6) + 231.0 + 53.0 + 291.4$$

$$RR = 1,258.4$$

$$\text{Revenue at Existing Rates (+ Other Revenue)} = 1,249.7$$

$$\text{Revenue Deficiency or Rate Increase} = \underline{8.7}$$



Revenue Requirement Example

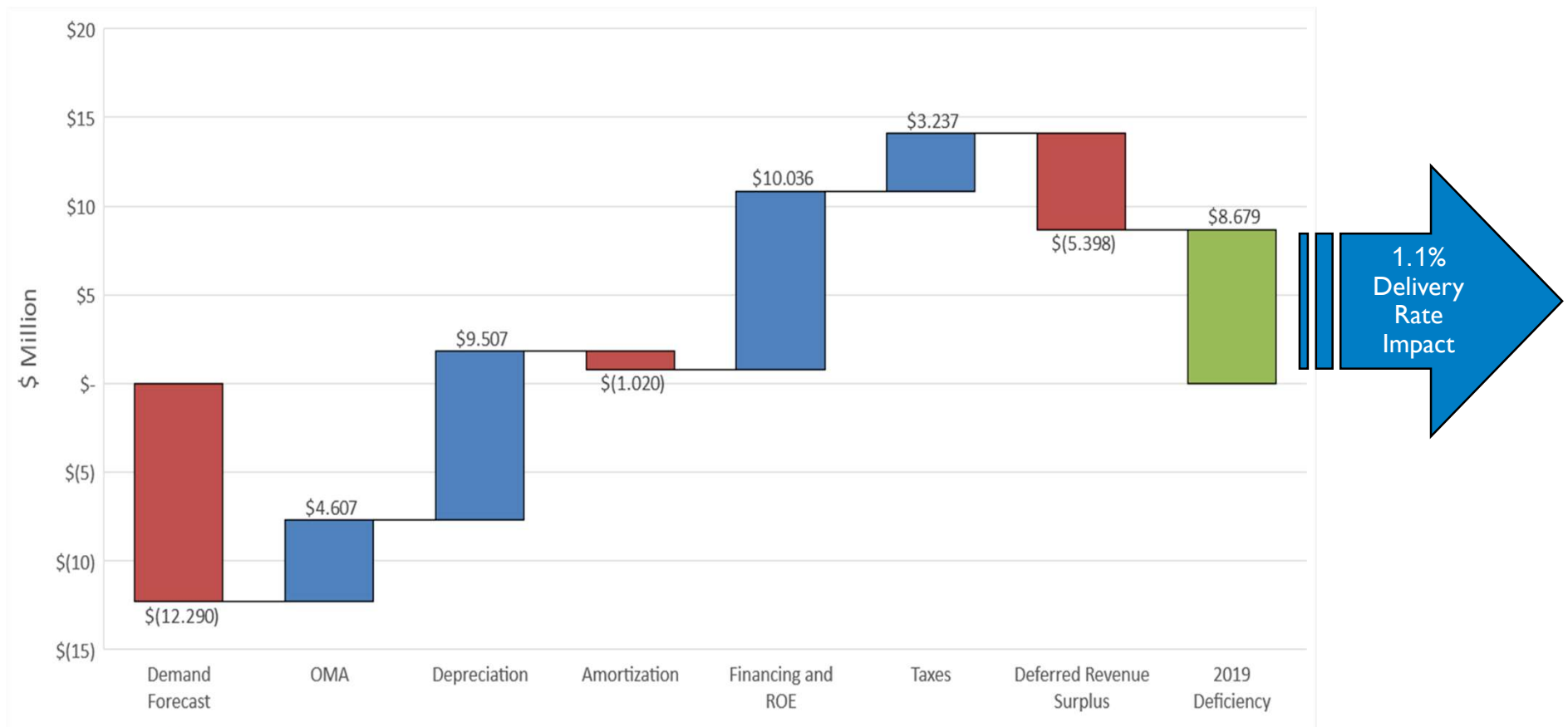
Test Year Revenue Requirement – FEI 2019

		2019 (\$ Millions)	
Rate Change	=	Volume x Existing Rates	
\$8.7		\$1,204.8	
		Less	
		= Total Revenue Requirement	\$1,213.4
		+ Cost of Gas	\$369.3
		Total Delivery = Margin	\$844.1
		+ OM&A	\$246.1
		+ Property Taxes	\$67.6
		+ Depreciation & Amortization	\$231.0
		- Other Revenue	(\$44.9)
		+ Income Taxes	\$53.0
		Earned Return	\$291.4
Rate Base	x	Return on Rate Base	
\$4,491.5		6.49%	



Revenue Requirement Example

Factors leading to 2019 Revenue Deficiency



Revenue Requirement Example

Rate Increase Summary

\$ millions	Revenue at Existing Rates		Effective Increase		Revenue at Revised Rates	
Residential	\$	704.4	\$	5.2	\$	709.7
Commercial		373.8		2.5		376.3
Industrial		91.2		0.9		92.1
Subtotal	\$	1,169.5	\$	8.7	\$	1,178.1
Bypass		35.3		-		35.3
Other Revenue		44.9		-		44.9
Total	\$	1,249.7	\$	8.7	\$	1,258.3



Revenue Requirement

Recovery of Revenue Requirement from Ratepayers


Revenue Requirement increase is allocated to customer classes

Rates are designed to recover all of the Revenue Requirement in the test year based on forecast volumes


- $\text{Revenue/year} = \text{number customers} \times \text{volume/customer/year} \times \text{revenue/volume}$
- $\text{Rate} = \text{Revenue requirement} / \text{unit volume}$

More on cost allocation and rate design in later sessions





Capital Additions and Utility Earned Return



Change in Rate Base


	Opening Balance \$ millions	Additions \$ millions	Retirements** \$ millions	Retirement Costs \$ millions	Closing Balance \$ millions
Gross Plant	1,499	32	(2)	-	1,530
Accumulated Depreciation*	(484)	(23)	2	-	(505)
Net Plant	1,015	9	-	-	1,025

Without new additional, rate base would have been decreased by \$23 million (depreciation expense)



Approval of Capital Expenditures

Capital Expenditure Justification

- 
- The capital expenditure is necessary to deal with a safety hazard or system reliability concerns.
 - The capital expenditure is necessary to replace an obsolete asset which is necessary but no longer serves its purpose.
 - Present value (PV) of future revenues is greater than the PV of all costs (capital expenditure, O&M, taxes, etc.)
 - PV of future savings (capital or O&M) or avoided costs is greater than the PV of all costs.
 - Signed contracts from customers or shippers requiring new facilities to be constructed.



Approval of Capital Expenditures

Cost Estimates of Capital Expenditures

- Engineering estimates based on similar recent projects
- “Courtesy bids” from contractors
- Quotes from vendors, preferably more than one
- In addition to the direct capital costs the estimate includes:
 - Environmental costs
 - Contingency costs
 - Overhead costs
 - Regulatory approval costs



Approval of Capital Expenditures

Addition to Rate Base on Completion of Capital Project

Are actual costs different than forecast?



Explanation of variances

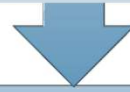
Unforeseen events, weather

Poor cost estimates



Is the original justification still valid?

Re-do economic justification based on actual costs



Potential disallowance of costs if the regulator is unconvinced

Not all costs can be added to rate base.





Regulator Decision



Regulator Decision

Balance of Interest between Customers and Utility

For Customers

Utility service at fair and reasonable rates without undue discrimination or preference



For the Utility

Recover costs of providing service including a fair and reasonable return on the property employed in providing utility service.



Regulator Decision

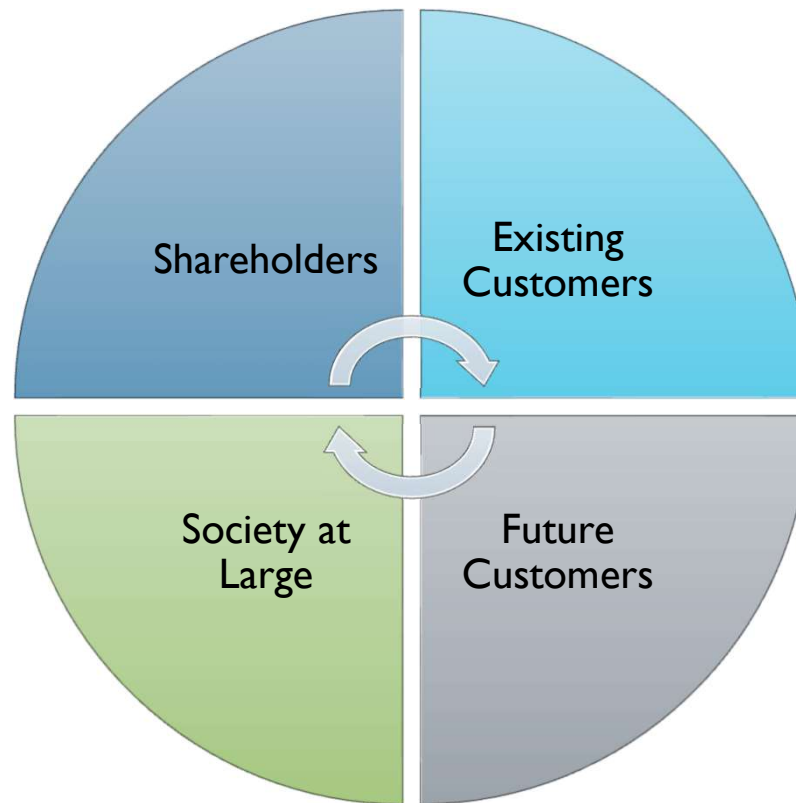
Balance of Interest between Customers and Utility

Revenue
Requirements

Rate Design

Capital Projects

Cost Allocation



Regulator Decision

Regulator Adjusts Revenue Requirement

Potential Areas of Adjustment

Does not approve certain capital expenditures

- Effect is reduced rate base, $r(RB)$, depreciation expense, taxes

Decides that the revenue forecast is understated

- Increases sales volumes and revenue forecast (with corresponding cost of gas) – revenue deficiency decreases

Decides that other revenue business should be at the allowed rate of return

- imputes additional revenue and decreases revenue deficiency

Decides that OM&A cost forecast is overstated

- reduces OM&A costs and revenue deficiency

Reduces ROE or debt interest rates

- ROE change affects $r(RB)$ and taxes, interest change affects $r(RB)$



Regulator Decision

Adjustments to Revenue Requirement – FEI 2016

	2019	
	\$ Million	% Rate Change
Proposed Rate Change	0.0	0.0%
Evidentiary Update	8.7	1.1%
<i>Adjustments:</i>		
Volume/Revenue Related Change	2.1	
O&M Changes	0.0	
Depreciation Expense Change	0.2	
Amortization Expense Change	4.5	
Financing Rate and Ratio Change	(0.7)	
Rate Base Growth	0.7	
Tax Expense	1.9	
<i>Total Adjustments</i>	8.7	
Revised Rate Change	8.7	1.1%



Cost of Service Regulation - Review & Summary

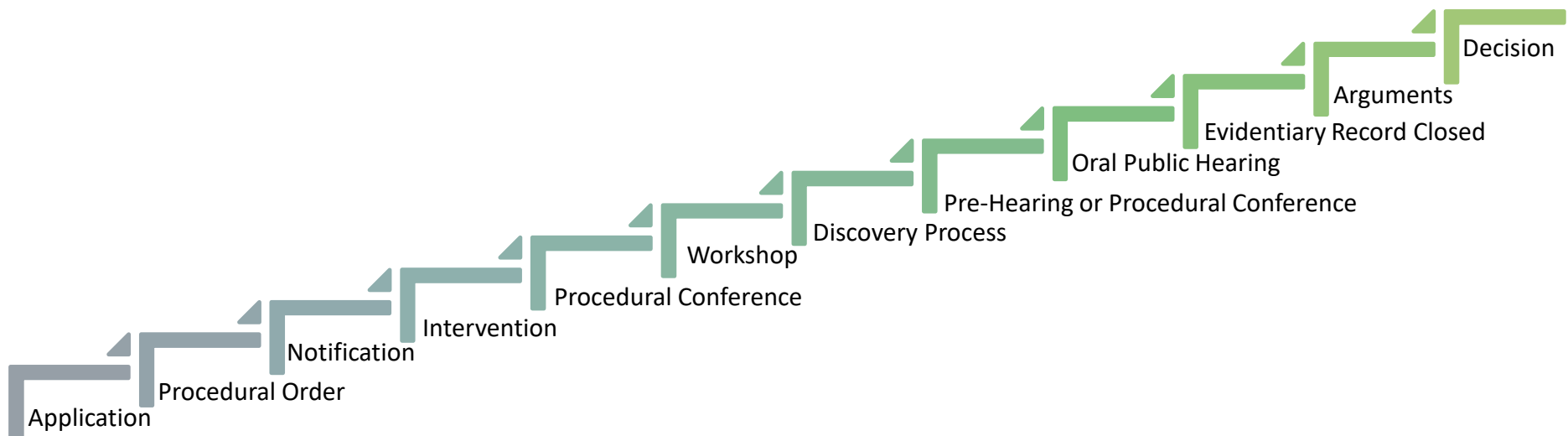
Regulatory Process

- Annual or regular rate hearings where the company is able to adjust rates on an annual basis in response to changes in costs
- Adequate evidence on each revenue requirement item to justify recovery in rates
- Forward test year - the company generally only spends what the regulator approves
- Company is at risk for forecast accuracy of revenue requirement components which are generally under management control
- Costs not under management control or otherwise subject to deferral are deferred and amortized in approved manner
 - Variance accounts collect variances from forecast costs
 - Deferral accounts collect un-budgeted costs



Cost of Service Regulation - Review & Summary

Regulatory Process



Duration can be 3 months to over 1 year



Cost of Service Regulation - Review & Summary

Advantages of Cost of Service Regulation

- ✓ Ability to recover the cost of providing service to existing customers
- ✓ Ability to recover the cost of adding new customers
- ✓ Ability to minimize risk by the adjustment of forecasts, generally on an regular basis
- ✓ Ability of utility shareholders to receive a stable ROE over a long period of time



Cost of Service Regulation - Review & Summary

Disadvantages of Cost of Service Regulation

Long and expensive hearings to determine if the utility's cost forecasts are reasonable.

Suspicion that the utility is overstating costs and understating revenues in its forecasts.

Little incentive for the utility to cut costs since future savings are passed on to customers.

Prone to micro-management of the utility by the regulator

Limited flexibility to respond to changing market conditions.

It is difficult for utility investors to earn a greater than allowed ROE even for superior performance.

PBR may be a solution to some of these problems.



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