



Rate Design

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Rate Regulation

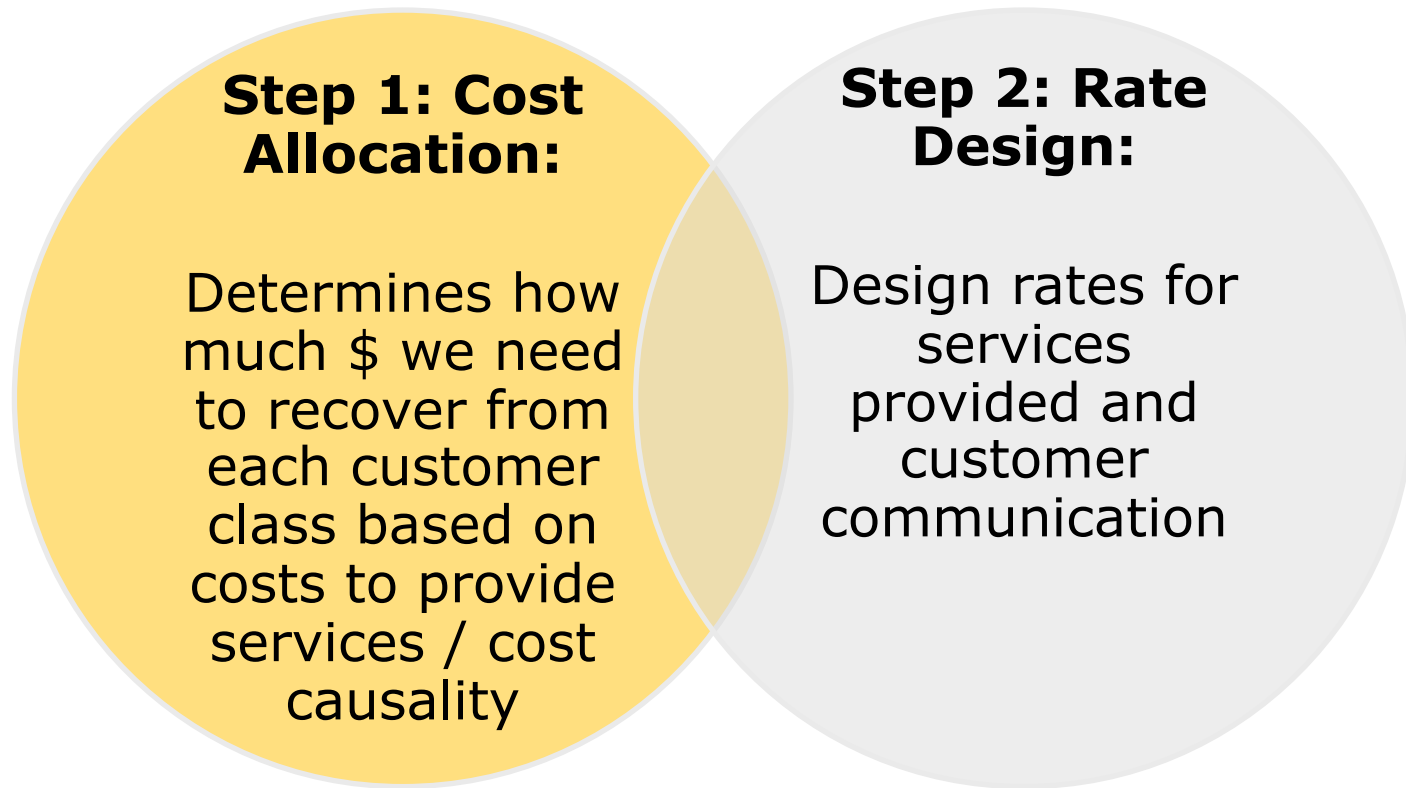
- Utilities cannot set its own prices (i.e. rates and tolls)
- To establish or change rates / tolls utilities must file a rate change application with their regulators
- Regulators must set rates that are just and reasonable

The Ontario Energy Board (OEB) Act defines a rate as: “a rate, charge, or other consideration and includes a penalty for late payment.”

The Origins of Just and Reasonable Rates....

- Sir Matthew Hale, Lord Chief Justice, England, 1670
 - Ferryboats, wharves, cranes in port towns, when these are the only ones chartered or when there is only one to serve the entire public, ceased to be entirely private because they were affected with public interest.
As a consequence, the owners of these facilities could not charge arbitrary or excessive duties or tolls, but only reasonable and moderate amounts.
The law required in addition to a reasonable toll, adequate service and proper maintenance of facilities used by the public. For failing in these duties, the operator was subject to a fine.

Cost Allocation vs. Rate Design

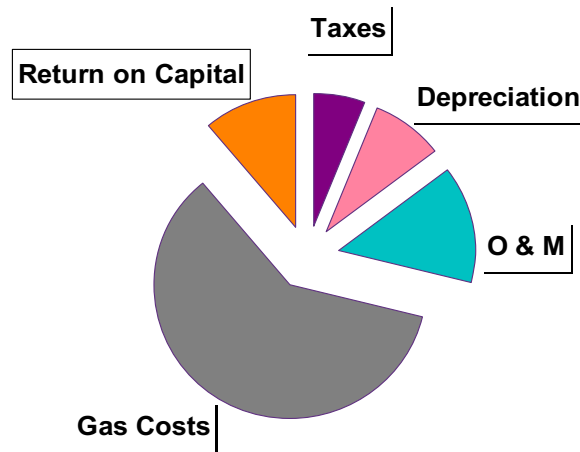


Rate Design Objectives....

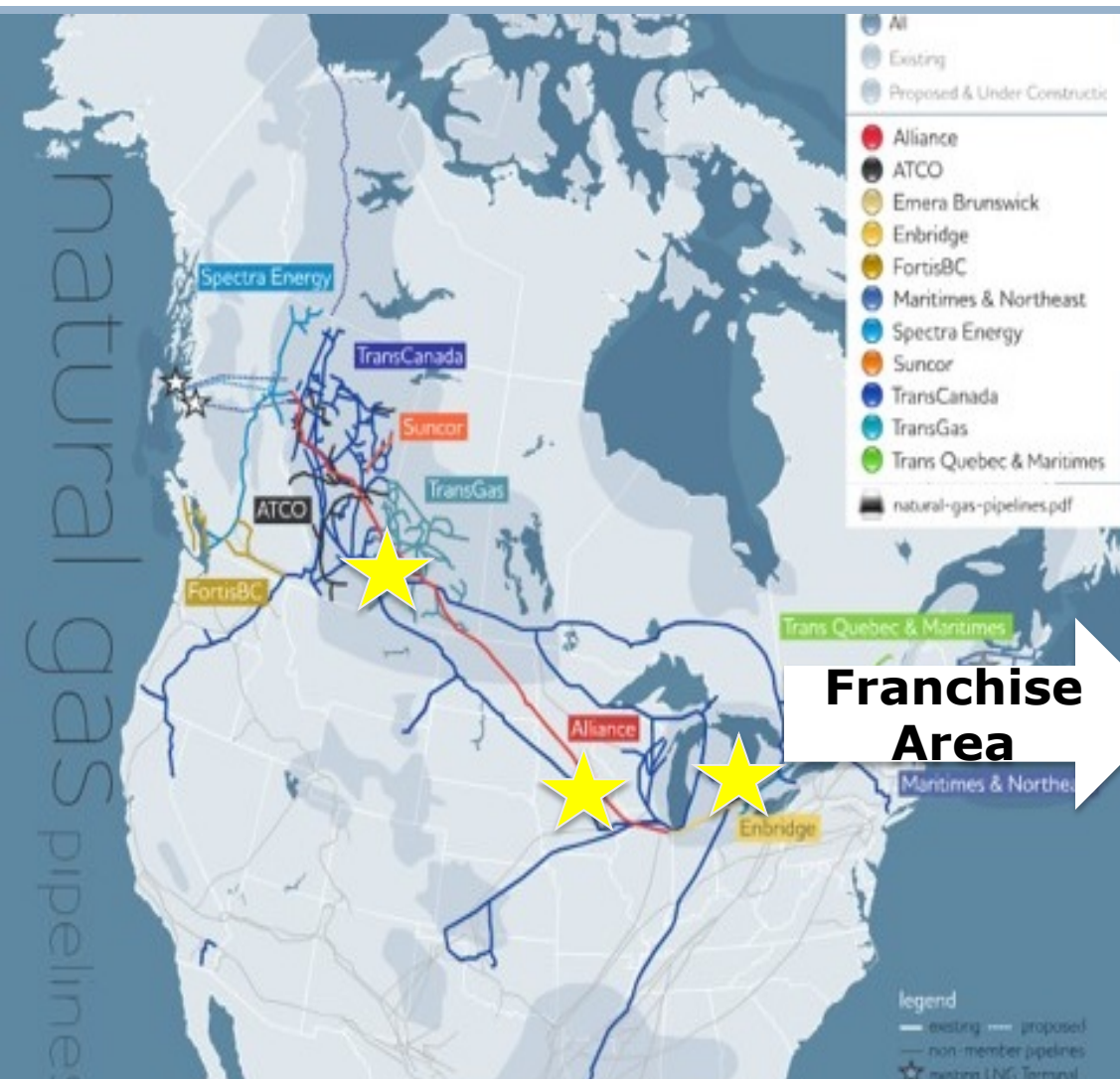
- Ensure that rates recover the forecast revenue requirement
 - Revenue requirement (RR) = revenue at proposed rates
- Ensure rates are just and reasonable
 - based on approved costs / revenue requirement
 - cost allocation acts as a guide to rate design
 - reflect cost causality / cost to serve
 - minimize cross-subsidization between rate classes
 - simple to understand and administer
 - stakeholder acceptance

Rate Regulation: Rate Change Process

- Quarterly Rate Adjustment
 - Addresses gas cost
- Annual Rate Adjustment
 - Addresses distribution cost (monopoly business)



Gas Supply Plan



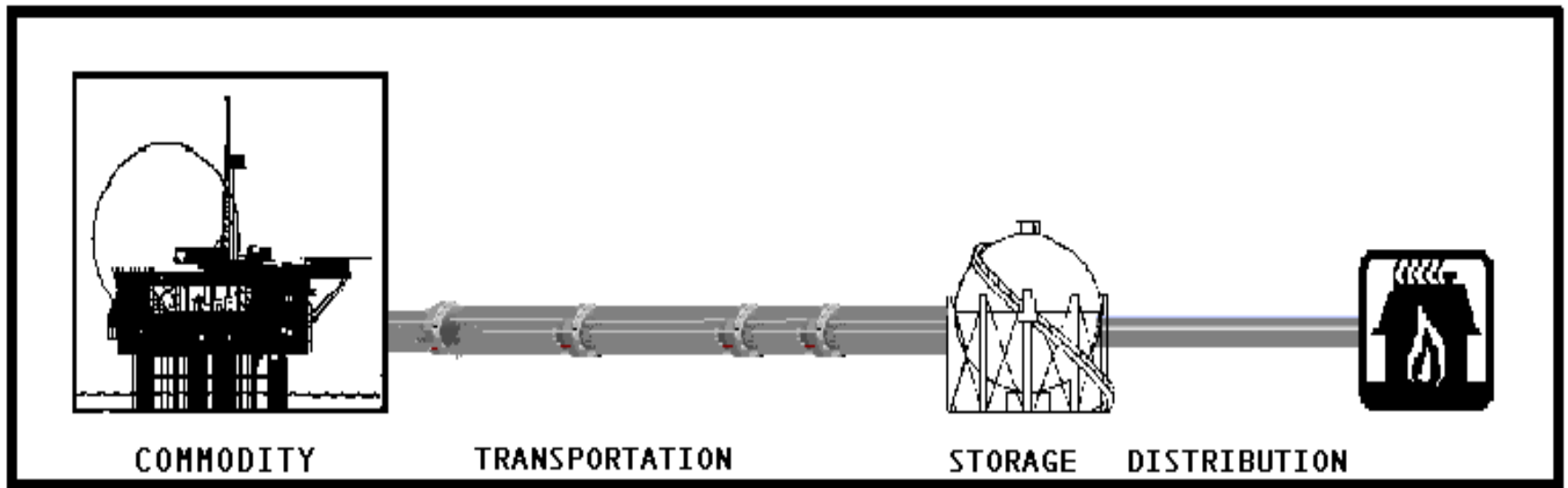
Determines how natural gas will be supplied to customers and associated costs.



Rate Regulation: Choice of Supply for Customers

- In Ontario customers have a choice from whom they buy their natural gas supply:
 - Natural gas utility (rate fluctuates with market)
 - Marketer or broker (fixed price over a set contract term (1 – 5 years))
- Utility neutral with respect to customer's choice
- Over the past 5 years in Ontario electricity and oil have been approximately 65% more expensive than natural gas

Rate Regulation: Services Provided



**SERVICE
TYPES:**

UNBUNDLED

ONTARIO BUNDLED T

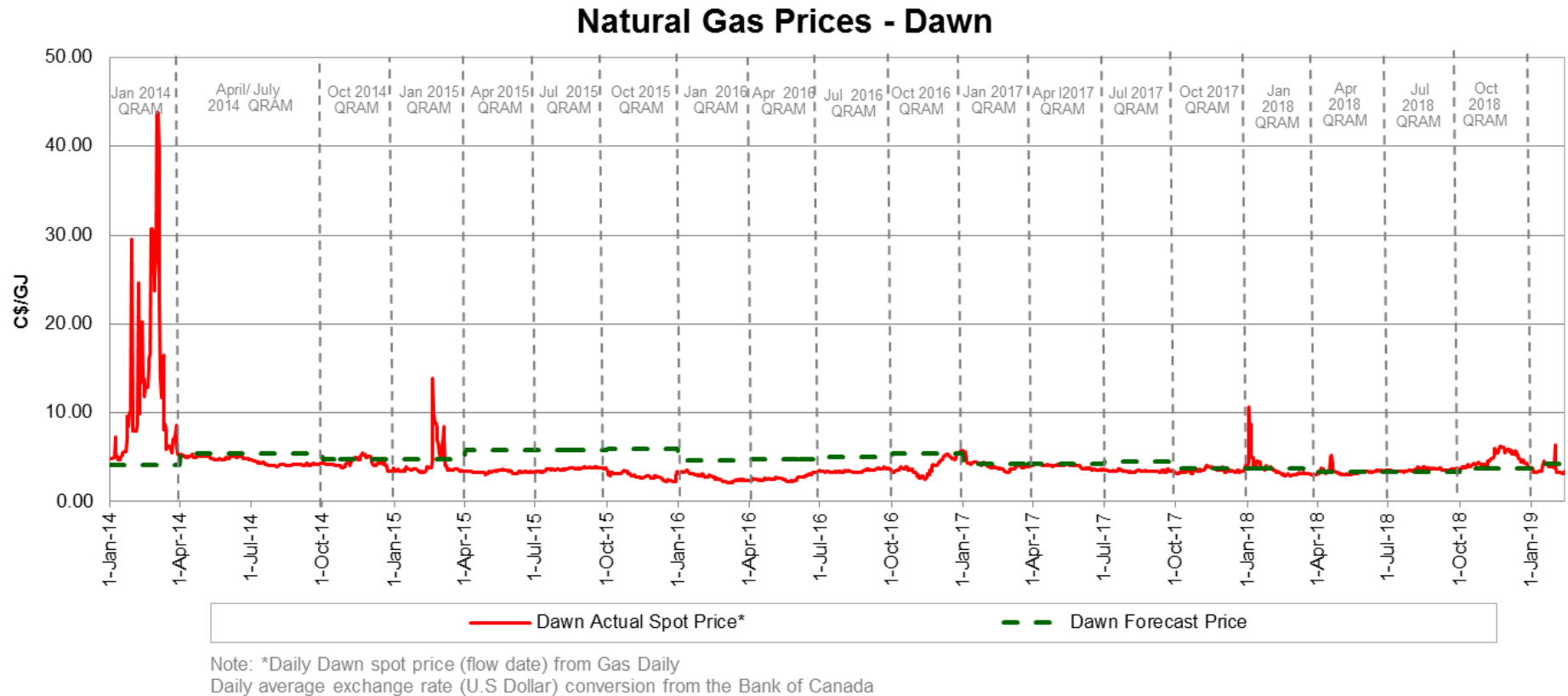
WESTERN BUNDLED T

SALES or SYSTEM GAS

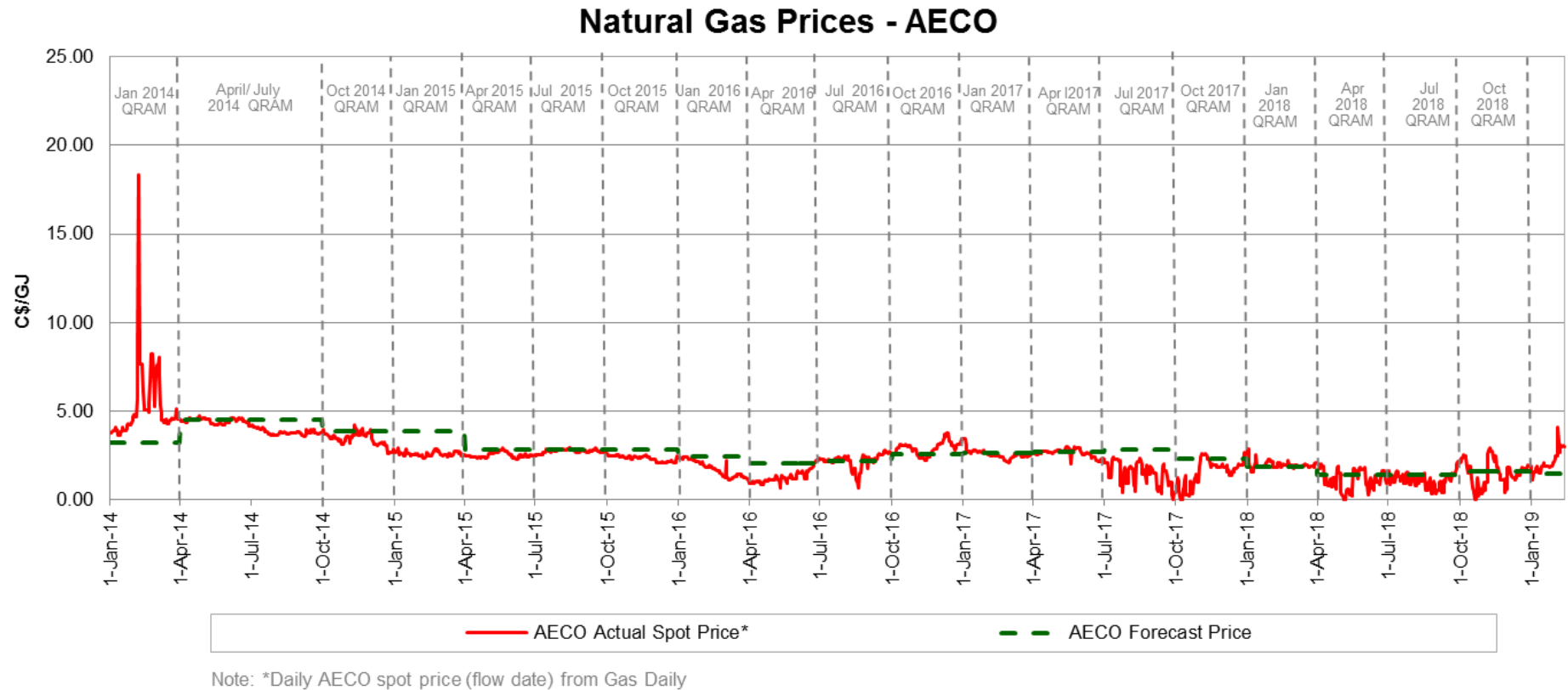
Rate Regulation: Gas Cost Charges

- Quarterly Rate Adjustments (QRAMs) determine upstream gas cost charges (natural gas commodity, transportation of gas from a supply basin to utility, load balancing, etc.)
 - Gas cost charges = approx. 2/3 of annual bill
 - Quarterly process to provide timely price signals to customers (natural gas is a traded commodity)
 - Utility passes through gas costs to customers without mark up
 - Utility does not make a profit on gas costs

Natural Gas Prices: Last 6 Winters



Natural Gas Prices: Last 6 Winters



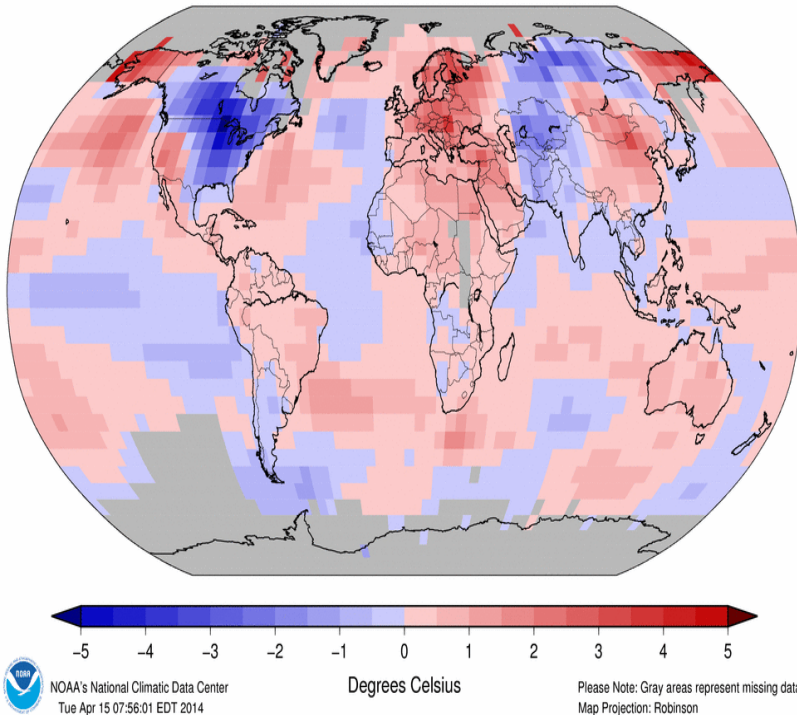
Weather: Winters of 2014 and 2015

Winter 2015 as cold as Winter 2014 for Eastern Canada/US Northeast; Milder everywhere else

2014Q1

Land & Ocean Temperature Departure from Average Jan–Mar 2014
(with respect to a 1981–2010 base period)

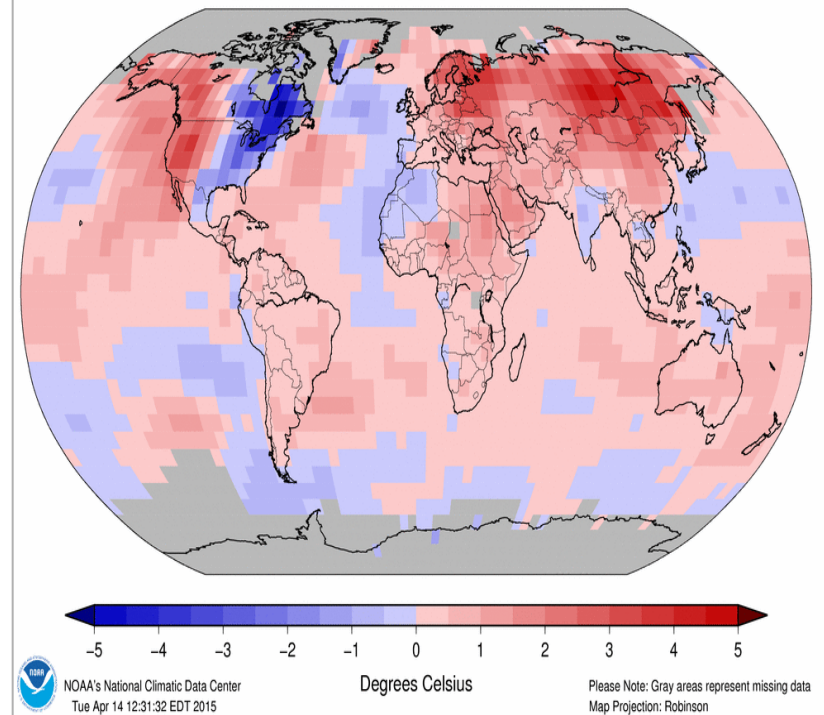
Data Source: GHCN–M version 3.2.2 & ERSST version 3b



2015Q1

Land & Ocean Temperature Departure from Average Jan–Mar 2015
(with respect to a 1981–2010 base period)

Data Source: GHCN–M version 3.2.2 & ERSST version 3b



Source: NOAA



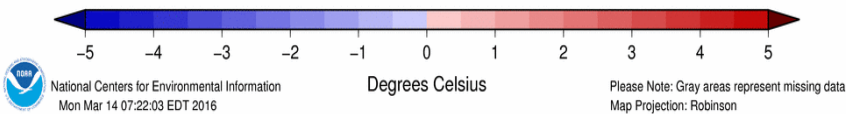
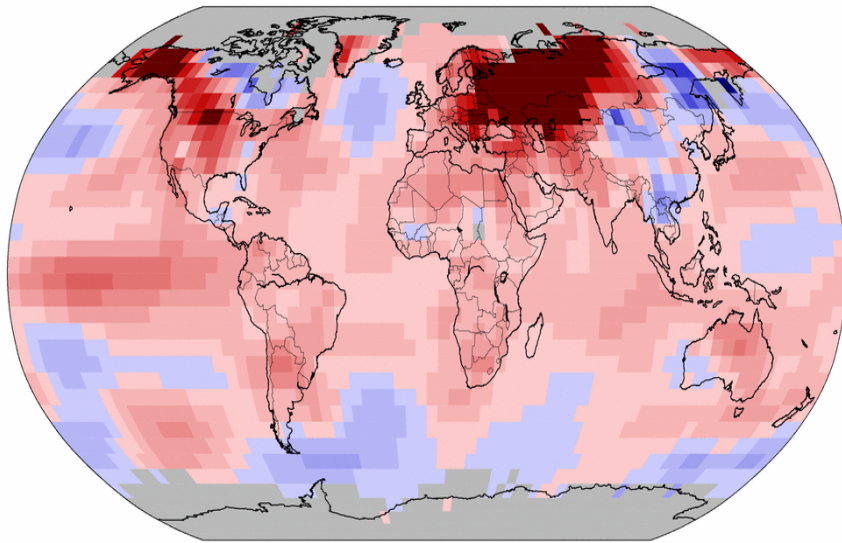
Weather: Winters of 2016 and 2019

Mild winter in 2016, cold winter in 2019

2016Q1

Land & Ocean Temperature Departure from Average Feb 2016
(with respect to a 1981–2010 base period)

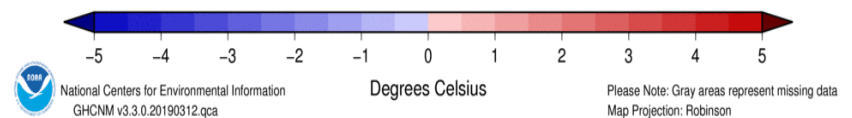
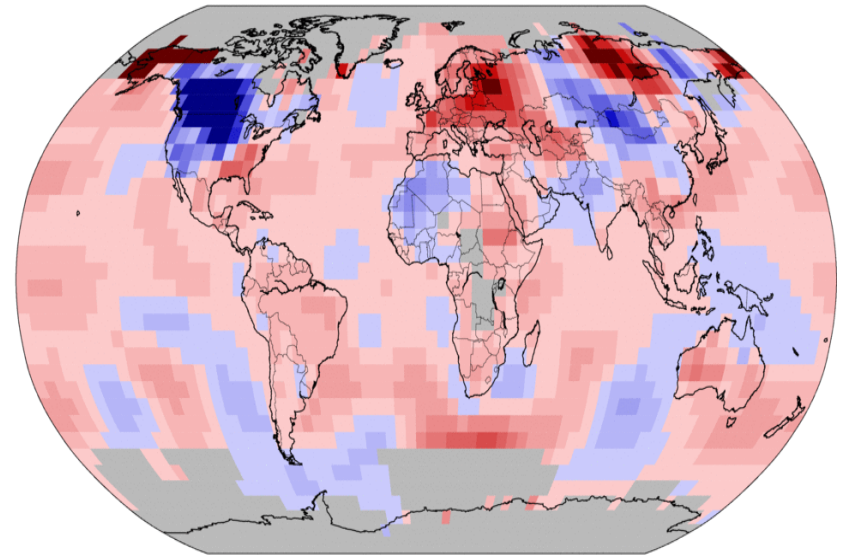
Data Source: GHCN–M version 3.3.0 & ERSST version 4.0.0



2019Q1

Land & Ocean Temperature Departure from Average Feb 2019
(with respect to a 1981–2010 base period)

Data Source: NOAA GlobalTemp v4.0.1–20190312



Source: NOAA



Rate Regulation: Gas Costs Charges

Forecast

Forecast Price = \$3 / Unit of Volume

Rate Design:

$\$300 / 100 = \$3 / \text{Unit of Volume}$

Forecast Cost:

Volume x Price = Cost:

$100 \times \$3 = \300

Forecast Revenue:

$100 \times \$3 = \300



Actual

(1) Supply Cost: $150 \times \$3 = \450

Revenue: $150 \times \$3 = \450

} PGVA = \$0

(2) Supply Cost: $100 \times \$4 = \400

Revenue: $100 \times \$3 = \300

} PGVA = \$100

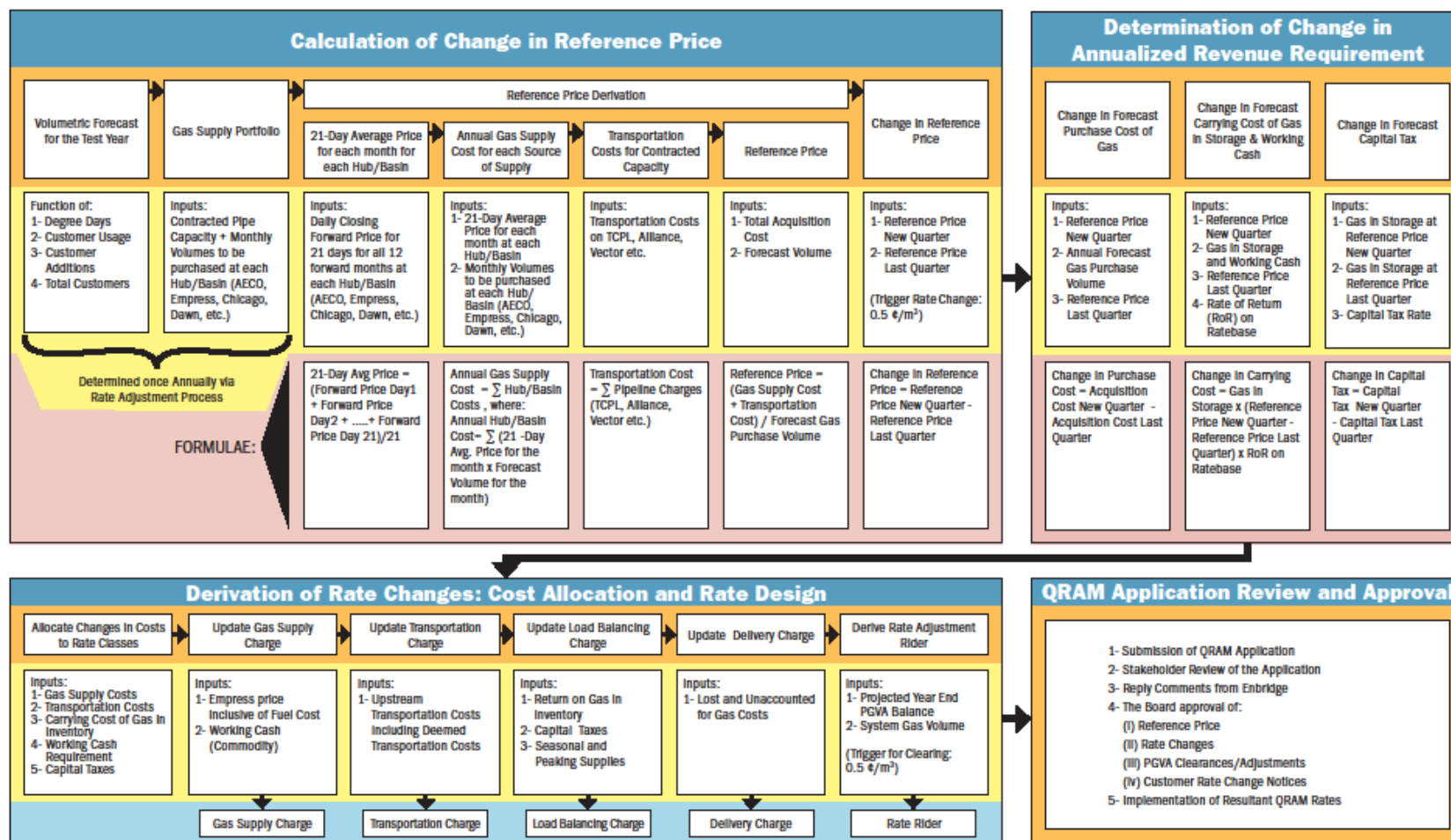
(3) Supply Cost: $50 \times \$4 = \200

Revenue: $50 \times \$3 = \150

} PGVA = \$50

GRAM Process and Derivation of Gas Supply and Transportation Rates

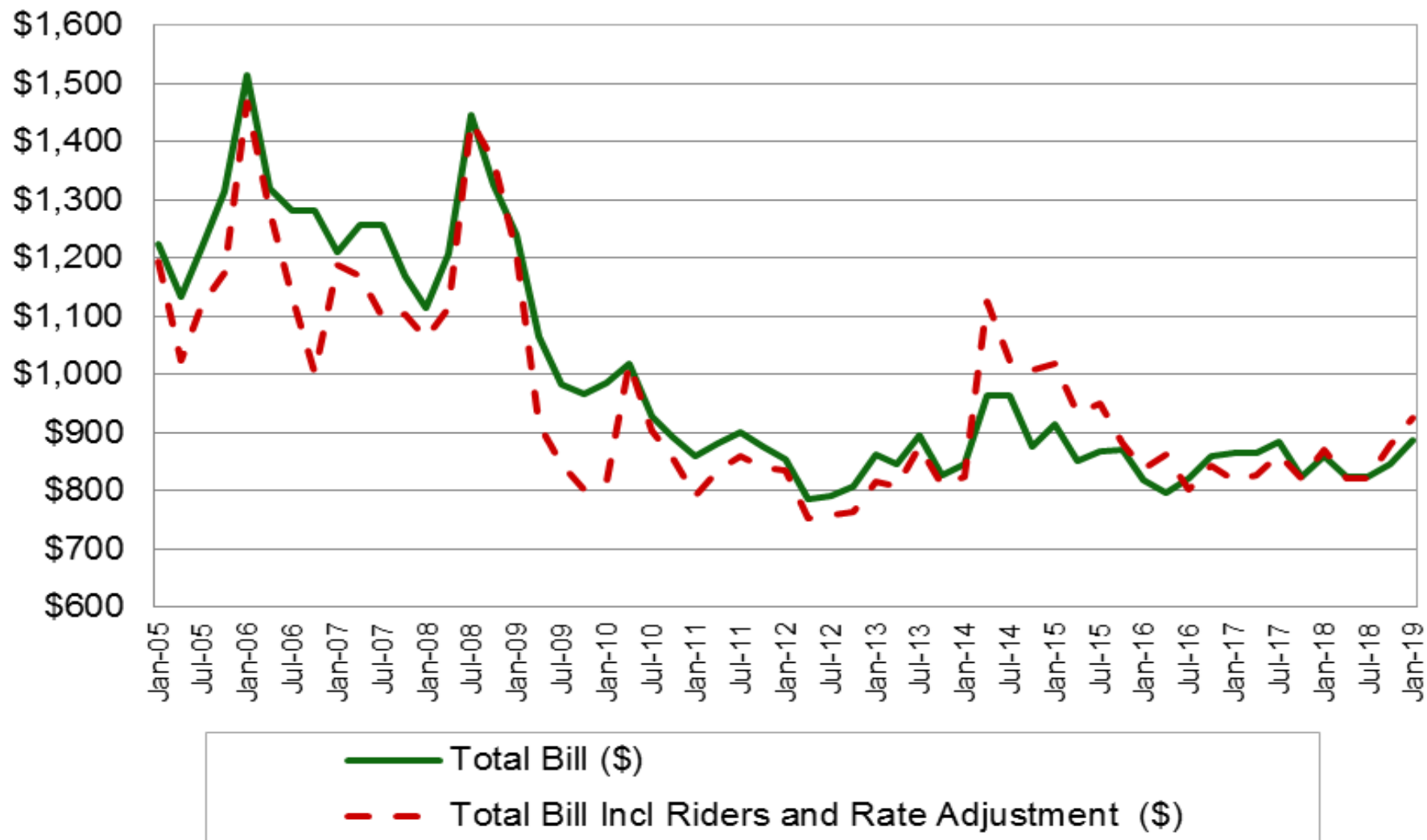
Enbridge Gas Distribution GRAM Process



Note: Monthly Customer Charge and Contract Demand Charge do not change with GRAMs.

Annual Bill: Residential Customers

Residential Annual Bill



Rate Regulation: Distribution Charges

- Annual Rate Adjustment determines the change in distribution charges
 - Distribution charges = approx. 1/3 of annual bill
 - Recovers the cost of:
 - Safe and reliable distribution of natural gas through the Company's network of pipelines to customers
 - Company's gas storage facilities
 - Customer service (billing, call centre, emergency response, etc.)
- How are rates designed?

Revenue Requirement & Cost Recovery Through Rates

REVENUE REQUIREMENT (2014)									
ITEM	DESCRIPTION	\$ M	Costs	Services	Charges				
1	Gas Supply Plan Costs	\$ 1,456.3	Gas Supply Plan	Commodity	Gas Supply Charge				
				Transportation	Transportation Charge				
2	Operation & Maintenance	\$ 425.3		Load Balancing	Load Balancing Charge				
				3 rd Party Storage	Added to Delivery Charge				
3	Depreciation	\$ 248.5	Operating & Capital Costs = Margin						
4	Municipal Taxes	\$ 41.2		Safe, Reliable	Customer & CD Charge				
5	Other Operating Revenues	\$ (42.7)		Delivery of Gas	Delivery Charge				
				Storage					
				DSM					
6	Cost of Capital & Taxes	\$ 307.8		Customer Care					
7	Gas Supply Plan Costs	\$ 1,456.3		\$ 620.2	63%	Customer & CD Charges			
8	Operating & Capital	\$ 980.1	= 2014 Margin	\$ 359.9	37%	Delivery Charges			
9	Total Revenue Requirement	\$ 2,436.4	2014 Margin =	\$ 980.1	=	Total Operating & Capital			

Capital Related Revenue Requirement

<u>Utility Capital Structure</u>		Component	Cost Rate	
		%	%	
L & M Term Debt		60.17%	5.80%	
Short Term Debt		1.39%	2.00%	
Preference Shares		2.44%	3.20%	
Common Equity		36.00%	8.93%	
<u>Depreciation</u>				
Ave. Depreciation Rate			4.30%	
<u>Income Taxes</u>				
Income Tax Rate			26.50%	
<u>Project A: Base Year</u>				
Capital Expenditure			\$ 100,000,000.00	
Rate Base			\$ 100,000,000.00	
				Revenue Requirement
			Cost Rate	
			%	\$
L & M Term Debt	\$ 60,170,000.00		5.80%	\$ 3,489,860.00
Short Term Debt	\$ 1,390,000.00		2.00%	\$ 27,800.00
Preference Shares	\$ 2,440,000.00		3.20%	\$ 78,080.00
Common Equity	\$ 36,000,000.00		8.93%	\$ 3,214,800.00
Total	\$ 100,000,000.00			\$ 6,810,540.00
Depreciation				\$ 4,300,000.00
Income Tax				\$ 851,922.00
<u>Project A Base Year Revenue Requirement</u>				\$ 11,962,462.00
<u>Project A Base Year Revenues</u>				\$ 11,962,462.00

Note 1: In Cost of Service (COS) regulatory regime rates are set so that:
revenues = revenue requirement

Note 2: This is simplified example for illustration purpose. The actual determination of revenue requirement is a more involved process.

Rate Regulation: Recap

- There is no markup or profit on:
 - upstream costs (i.e. gas costs)
 - operation and maintenance costs
 - depreciation expense
 - interest expense
 - taxes
- Profit is in the return on investment in the equity portion of rate base
 - If shareholders' equity is 36%, then profit is the return on equity (ROE) approved by the regulator
 - If ROE is 8.93%, then on a \$100 capital expenditure, shareholders invest \$36 with the rest financed by long and short term debt
 - Hence, shareholders' return on \$36 investment is:



$$\$36 \times 0.0893 = \$3.21$$

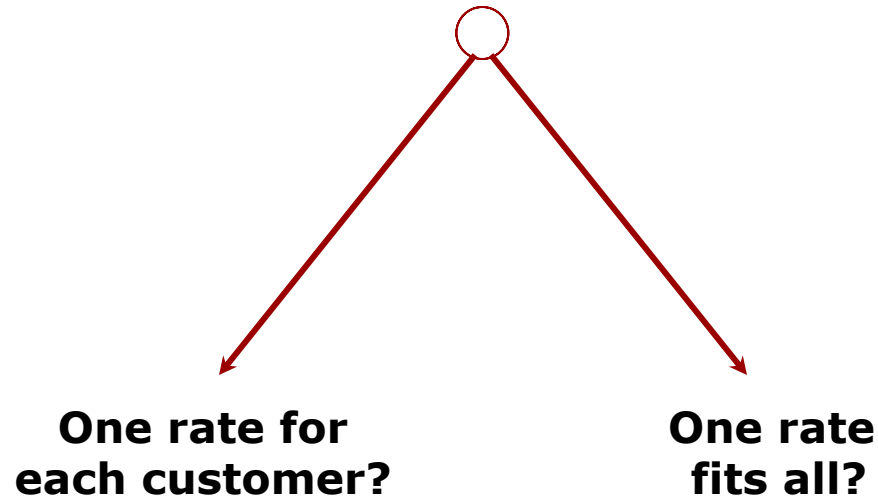
Rate Regulation: Distribution Charges

■ Example: Residential Project

Length of pipe = 20 m
Pipe size = 1/2" (plastic)

- Capital Expenditure = \$1,800
- Annual Volume = 3,000 m³
- Annual Revenue Requirement = \$300.0
 - O&M + depreciation + interest + return & taxes

The Rates Spectrum



⇒ **How many rates? How should rates be designed?**

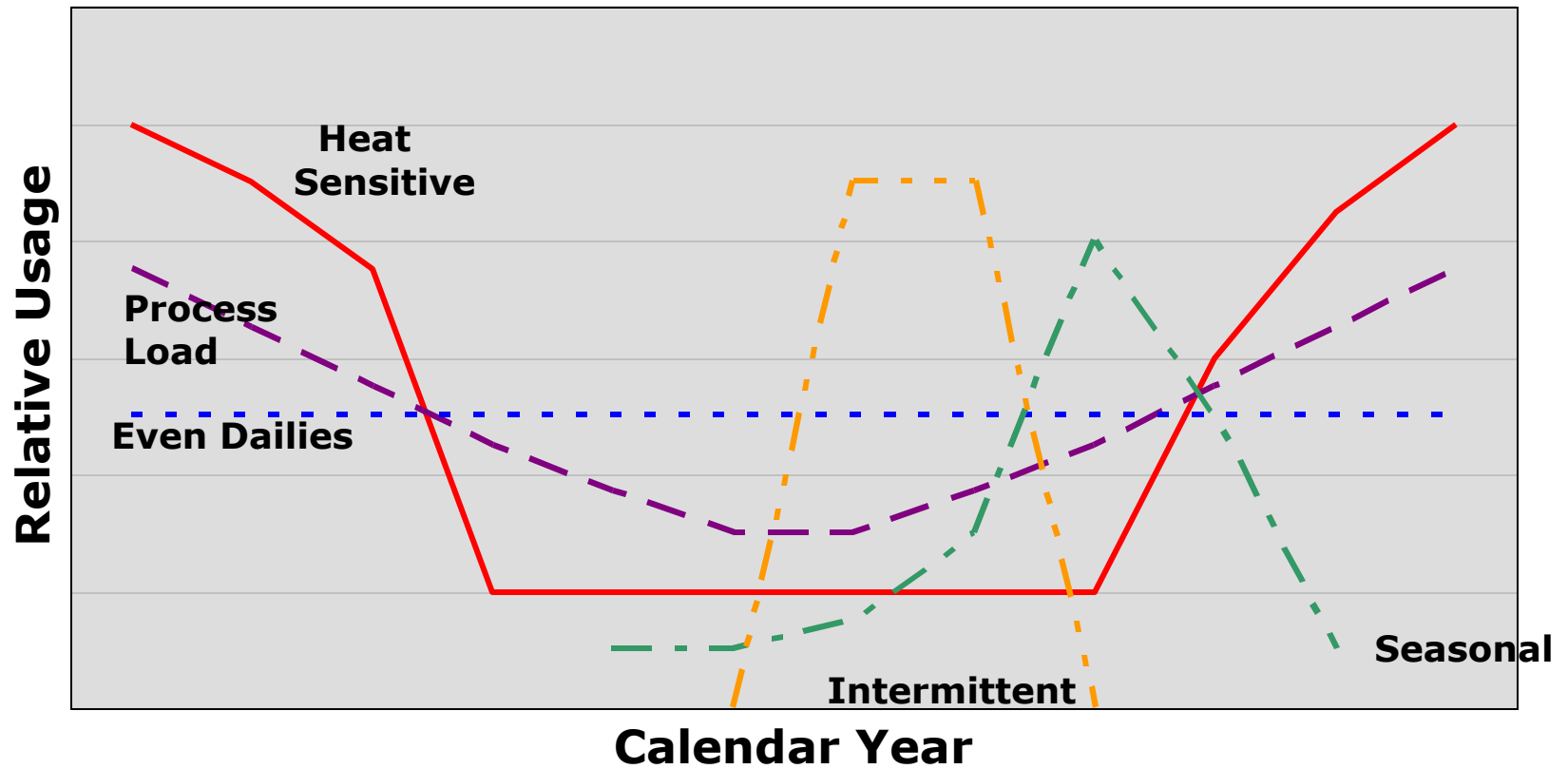
The Rates Spectrum Con't

- Simple Rate = Cost/Volumes
- Simple Rate = Cost/Number of Customers
- Simple Rate = Cost/Maximum Daily Demand (reservation charge)
- Complex Rate = Use a combination of the above, and/or have different rates for different blocks of consumption

Rate Design: Factors to Consider

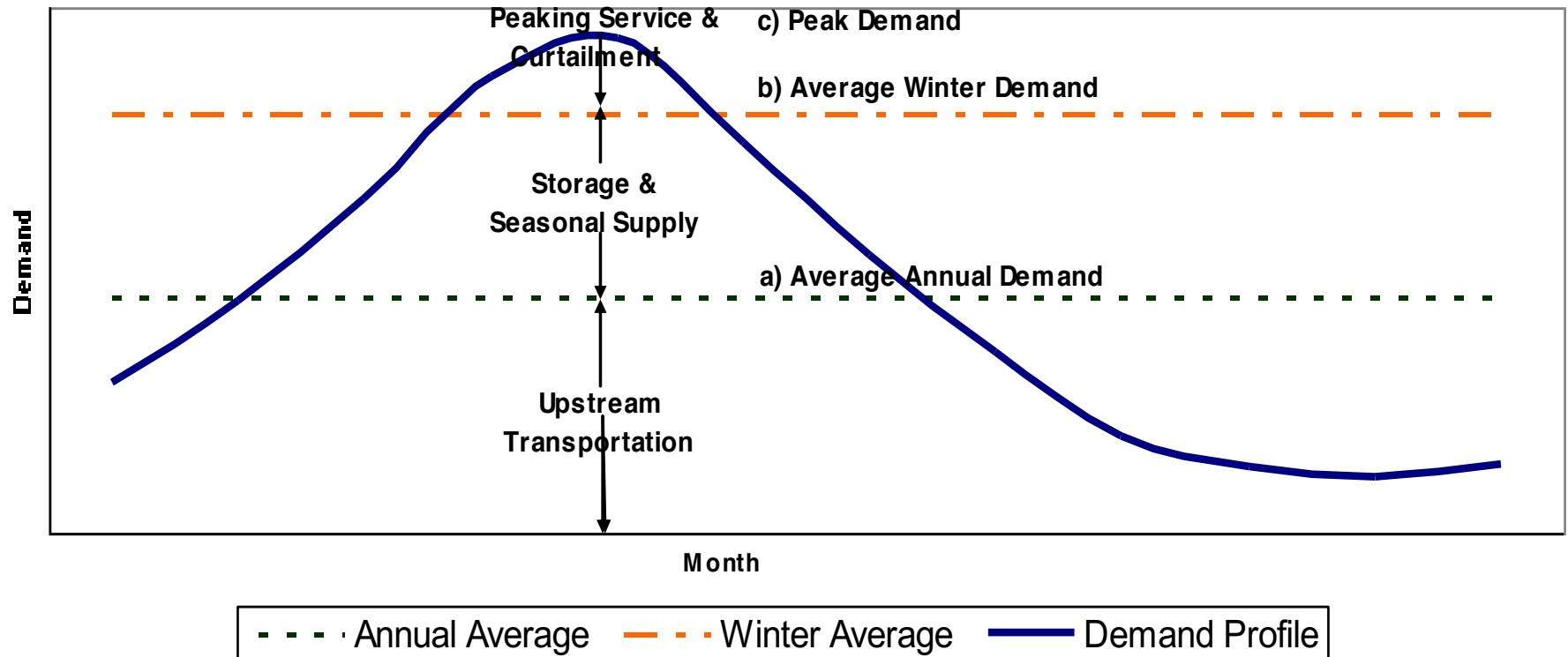
- Gas usage (i.e. load) profiles
- Character of service and quality
 - **Firm:** continuous service without curtailment, except under extraordinary circumstances
 - **Interruptible:** service subject to curtailment on a pre-determined notice period at the option of the Company

Load Profile Graph



Asset and Service Requirements Con't

Sources of Supply and Annual Demand Profile



Load Factor

$$\text{LF (\%)} = \frac{\text{ANNUAL VOLUME} / 365}{\text{PEAK DAY VOLUME}}$$

- Load factor represents the average daily volume of gas used by a customer over the year expressed as a percentage (%) of the customers' peak day consumption
- The higher the load factor the better the system utilization and lower the cost to serve a customer class

Load Factor: Illustrative Example

Customers A and B both have annual consumption of 365 units, but operate at vastly different load factors:

- Customer A: Load Factor = 100%
- Customer B: Load Factor = less than 1%

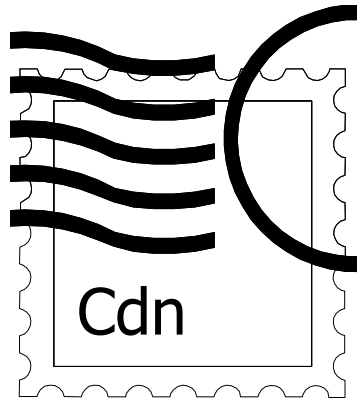
What are cost characteristics to serve each customer?

Rate Design: Class Ratemaking

- Common groupings (LF, capital investment)
- Sufficient class size
- Sufficient differences between classes
- Administrative efficiency
- Simple to understand and use
- Stable rates
- Choice
- Continuity of service

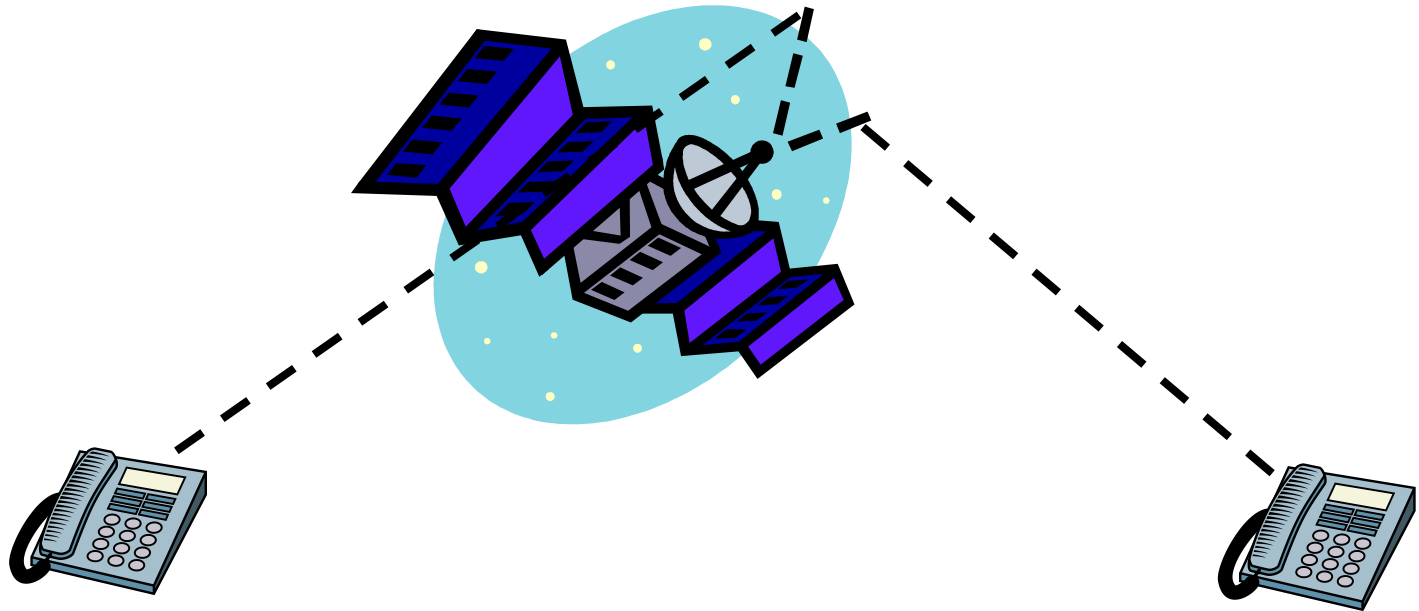
Postage Stamp Rates

- All customers in the rate class are charged the same rates regardless of the distance travelled to provide the service.



Distance Based Rates

- Rates that vary in relationship to the distance travelled to provide the service.



Zonal Rates

- Modified distance based rates
- Same rates to all customers within each zone
- Different rates for each zone

- For example, TransCanada (TCPL tolls) are volume and distance based
 - a function of how much gas is flowing and how far it is flowing

Example: EGD Current Rates

- Rate 1: General Service rate (residential)
- Rate 6: General Service rate (commercial)
- Rate 9: Container Service rate (NGV)
- Rates 100, 110, 115: Large volume firm rates
- Rate 135: Large volume firm seasonal rate
- Rates 145, 170: Large volume interruptible rates
- Rates 125, 300, 315, 316: Unbundled rates
- Rates 200: Wholesale rate
- Rates 325, 330, 331: Ex-franchise rates

Risk: Fixed & Variable Cost Recovery

- Most of the goods we buy are commodity priced (i.e. ¢/litre, \$/lb, etc.)
- “Pay as you go” is simple and natural
- **Volumetric risk (note: utilities install / build customer specific facilities)!**

Risk: Fixed & Variable Cost Recovery

- Total Variable
 - **All** costs in volumetric rate
- Full-Fixed Variable (“FFV”)
 - **All fixed** costs in demand rate
 - **All variable** costs in volumetric rate
- A number of approaches in between total commodity and FFV methods

Note: In Ontario the OEB has directed electric utilities to move to all fixed recovery (fixed charges) for distribution costs

Rate Regulation:

Impacts of Rate Structure

- Rate structure impacts cash flow during the year and business risk
- Increase in Fixed Charges (monthly customer & CD charges)
 - Flattens utility revenue profile – increases cash flow in summer months and reduces variation in quarterly earnings
 - Reduces weather and volumes risk, less impact (negative or positive) on annual earnings
- All rate design changes need to be approved by the Regulator
- Rate structure changes designed to be revenue neutral over the year on a budgeted basis

Impact on Customer Bills

- Customer bills can be many times greater in the winter than in the summer
- Approaches such as a Budget Billing Program spread bill amounts over the year
- Help customer budget for utility payments
- Such an approach is not a guarantee of fixed payments

For a “Snowbird” retirement community the most appropriate recovery of distribution costs would be:

- 1) Exclusively through volumetric charges
- 2) Exclusively through fixed charges
- 3) Through a combination of fixed and variable charges
- 4) Recovery of costs in this case may be uncertain, recover the costs from other customers

Pricing Frameworks

- Cost of Service (COS)
- Incentive Regulation (IR)

Rate Regulation: Distribution Charges

- Cost of Service (COS) Regulation
 - Distribution rates based on forecast costs of providing service to customers which includes earning a fair return on capital invested in network infrastructure
 - Utility forecast costs reviewed annually via Rate Case proceedings
 - This process requires the utility to submit and defend detailed forecasts and budgets
 - Each business unit prepares evidence with justification of its costs
 - For example, about 75 Enbridge witnesses involved in each COS proceeding

Rate Design: Rate Increase or Decrease...?

Scenario 1:

Test Year A):

Cost to Serve (\$)	103
Volume (m ³)	<u>103</u>
Unit Rate	1.00

Base Year B):

Cost to Serve (\$)	100
Volume (m ³)	<u>100</u>
Unit Rate	1.00

Unit Rate Change A) - B) = 0
Percentage Change A) vs B) = 0%

Scenario 2:

Test Year A):

Cost to Serve (\$)	103
Volume (m ³)	<u>100</u>
Unit Rate	1.03

Base Year B):

Cost to Serve (\$)	100
Volume (m ³)	<u>100</u>
Unit Rate	1.00

Unit Rate Change A) - B) = 0.03
Percentage Change A) vs B) = 3%

Rate Design: Rate Increase or Decrease...?

Scenario 3:

Test Year A):

Cost to Serve (\$)	100
Volume (m ³)	97
Unit Rate	<u>1.03</u>

Base Year B):

Cost to Serve (\$)	100
Volume (m ³)	100
Unit Rate	<u>1.00</u>

Unit Rate Change A) - B) = 0.03

Percentage Change A) vs B) = 3%

Scenario 4:

Test Year A):

Cost to Serve (\$)	103
Volume (m ³)	106
Unit Rate	<u>0.97</u>

Base Year B):

Cost to Serve (\$)	100
Volume (m ³)	100
Unit Rate	<u>1.00</u>

Unit Rate Change A) - B) = -0.03

Percentage Change A) vs B) = -3%

Illustrative Examples

Gas Distribution Utility (LDC):

- Approx. 1 million customers
- Inflation = 3% annually
- Customer growth = 2% annually
- Average use decline = 1% annually
- Does not own storage facilities
- Provides upstream services (gas supply, transportation and storage) to all of its customers

Derivation of Base Year Rates and Bills

Base Year (Cost-of-Service (COS)):

- Customer mix
- Revenue requirement
- Cost allocation
- Rate design
 - Customer bills

Base Year: COS

Rate Class Info - Customers & Volumes

Base Year: Number of Customers & Volumes

Rate Class	# of Customers (End of Year)	Average Use per Customer m3	Rate Class Annual Volume m3
Residential	1,000,000	3,000	3,000,000,000
Commercial	100,000	30,000	3,000,000,000
Industrial	100	30,000,000	3,000,000,000
Total	1,100,100		9,000,000,000

Base Year: COS Revenue Requirement

Base Year

Item	Revenue Requirement \$ M	
Natural Gas Cost	2,250	} Upstream Costs (Pass Through): \$2,692 M
Upstream Transportation Cost	360	
Storage Cost	82	
O&M	300	} Distribution Costs: \$630 M
Depreciation	100	
Taxes	30	
r(RB)	200	
Total	3,322	

Base Year: COS

Cost Allocation

Allocation of Costs by Rate Class

Item / Rate Class	Residential	Commercial	Industrial	Total
Natural Gas Cost	33%	33%	33%	100%
Upstream Transportation Cost	33%	33%	33%	100%
Storage Cost	56%	27%	17%	100%
Distribution Cost	60%	30%	10%	100%

Item / Rate Class	Residential	Commercial	Industrial	Total
	\$ M	\$ M	\$ M	\$ M
Natural Gas Cost	750	750	750	2,250
Upstream Transportation Cost	120	120	120	360
Storage Cost	46	22	14	82
Distribution Cost	378	189	63	630
Total	1,294	1,081	947	3,322

Base Year: COS Rate Design

1st Need to Determine:
Fixed vs. Volumetric Recovery of Distribution Costs

Assume United Methodology:
25% Fixed Recovery
75% Volumetric Recovery

Item / Rate Class	Residential \$M	Commercial \$M	Industrial \$M	Total \$M	%
Distribution Fixed Recovery	95	47	16	158	25%
Distribution Volumetric Recovery	284	142	47	473	75%
Total Distribution	378	189	63	630	100%

Base Year: COS

Rate Design

Unit Rates

Item / Rate Class	Residential \$/m ³	Commercial \$/m ³	Industrial \$/m ³
Gas Supply Charge	0.250	0.250	0.250
Transportation Charge	0.040	0.040	0.040
Storage Charge	0.015	0.007	0.005
Monthly Charge	\$ 7.88	\$ 39.38	\$13,125.00
Delivery Charge	0.095	0.047	0.016

Note: Delivery charges are often applied in “blocks of consumption”.

Base Year: Residential Customer Annual Bill

Annual Bill: Typical Residential Customer
Annual Consumption 3,000

	Unit Rates	Volume	Annual	%
	c/m3	m3	Charges	Total
			\$	Bill
Distribution Service:				
Monthly Charge	\$ 7.88	12 Bills	94.50	7%
Delivery Charge	0.09	3,000	283.50	22%
Subtotal a)			378.00	

Upstream Costs (Pass Through):

Service:				
Storage Charge	0.02	3,000	45.92	4%
Transportation Charge	0.04	3,000	120.00	9%
Gas Supply Charge	0.25	3,000	750.00	58%
Subtotal b)			915.92	
Total Charges: a) + b)			1,293.92	100%



Base Year: Commercial Customer Annual Bill

Annual Bill: Typical Commercial Customer
Annual Consumption 30,000

	Unit Rates c/m3	Volume m3	Annual Charges \$	% Total Bill
Distribution Service:				
Monthly Charge	\$ 39.38	12 Bills	472.50	4%
Delivery Charge	0.05	30,000	1,417.50	13%
Subtotal a)			1,890.00	
Upstream Costs (Pass Through):				
Service:				
Storage Charge	0.01	30,000	221.40	2%
Transportation Charge	0.04	30,000	1,200.00	11%
Gas Supply Charge	0.25	30,000	7,500.00	69%
Subtotal b)			8,921.40	
Total Charges: a) + b)			10,811.40	100%



Base Year:

Industrial Customer Annual Bill:

Annual Bill: Typical Industrial Customer
Annual Consumption 30,000,000

	Unit Rates c/m3	Volume m3	Annual Charges \$	% Total Bill
Distribution Service:				
Monthly Charge	\$ 13,125.00	12 Bills	157,500.00	2%
Delivery Charge	0.02	30,000,000	472,500.00	5%
Subtotal a)			630,000.00	
Upstream Costs (Pass Through):				
Service:				
Storage Charge	0.005	30,000,000	139,400.00	1%
Transportation Charge	0.04	30,000,000	1,200,000.00	13%
Gas Supply Charge	0.25	30,000,000	7,500,000.00	79%
Subtotal b)			8,839,400.00	
Total Charges: a) + b)			9,469,400.00	100%



Illustrative Example: COS Test Year Business as Usual

Test Year Forecast:

- No change in gas supply, transportation unit rates
- No change in storage costs
- Distribution revenue requirement increase = 3%
- Customer growth = 2%
- Average use decline = 1%
- Inflation forecast at 3%

Test Year: COS

Rate Class Info - Customers & Volumes

Test Year: Number of Customers & Volumes

Rate Class	# of Customers (End of Year)	Average Use per Customer m3	Rate Class Annual Volume m3
Residential	1,020,000	2,970	2,999,700,000
Commercial	102,000	29,700	2,999,700,000
Industrial	102	30,000,000	3,060,000,000
Total	1,122,102		9,059,400,000

Note: Assume new customers added to system mid-year.

Test Year: COS

Change in Revenue Requirement

Revenue Requirement

Item	Test Year \$ M	Base Year \$ M	Change \$ M	%	
Natural Gas Cost	2,264.85	2,250.00	14.85	0.7%	\$17.23 M
Upstream Transportation Cost	362.38	360.00	2.38	0.7%	
Storage Cost	82.00	82.00	-	0.0%	
O&M	308.25	300.00	8.25	2.8%	\$18.90 M
Depreciation	103.50	100.00	3.50	3.5%	
Taxes	30.90	30.00	0.90	3.0%	
r(RB)	206.25	200.00	6.25	3.1%	
Total	3,358.13	3,322.00	36.13	1.1%	

Summary:

Year-Over-Year Change in Revenue Requirement = \$36.13 M (1.1% Increase)

i) Upstream Costs (Pass Through) = \$17.23 M (0.7% Increase)

ii) Distribution Costs = \$18.90 M (3.0% Increase)

Test Year: COS Cost Allocation

Item / Rate Class	Residential	Commercial	Industrial	Total
	\$ M	\$ M	\$ M	\$ M
Natural Gas Cost	750	750	765	2,265
Upstream Transportation Cos	120	120	122	362
Storage Cost	46	22	14	82
Distribution Cost	389	195	65	649
Total	1,305	1,087	966	3,358

Test Year: COS Rate Design

Revenues at Existing (i.e. Base Year) Rates:

Item / Rate Class	Residential \$M	Commercial \$M	Industrial \$M	Total \$M	Deficiency / Sufficiency
Gas Supply Charge	750	750	765	2,265	\$0.27 M
Transportation Charge	120	120	122	362	
Storage Charge	46	22	14	82	
Monthly Charge	95	48	16	159	-\$16.42 M
Delivery Charge	283	142	48	473	
Total	1,295	1,082	966	3,342	
 Allocated Test Year RR	 1,305	 1,087	 966	 3,358	
 Deficiency vs. Allocated	 -10.43	 -5.21	 -0.51	 -16.15	

Notes:

- i) Revenues at Existing Rates = Test Year Customer #s or Volume x Base Year Rates
- ii) Propose to Increase Test Year Rates by \$16.15 M vs. Base Year Rates

Test Year: COS Rate Design

Proposed Unit Rates

Item / Rate Class	Residential \$/m ³	Commercial \$/m ³	Industrial \$/m ³
Gas Supply Charge	0.2500	0.2500	0.2500
Transportation Charge	0.0400	0.0400	0.0400
Storage Charge	0.0153	0.0074	0.0046
Monthly Charge	\$ 8.03	\$ 40.15	\$ 13,384.90
Delivery Charge	0.0973	0.0487	0.0159

Test Year: COS Rate Design

Revenues at Proposed Rates:

Item / Rate Class	Residential \$M	Commercial \$M	Industrial \$M	Total \$M
Gas Supply Charge	750	750	765	2,264.85
Transportation Charge	120	120	122	362.38
Storage Charge	46	22	14	82.00
Monthly Charge	97	49	16	162.23
Delivery Charge	292	146	49	486.68
Total	1,305	1,087	966	3,358.13
Allocated Test Year RR	1,305	1,087	966	3,358.13
Revenue to Cost Ratio	1.00	1.00	1.00	1.00

Notes:

- i) Revenues at Proposed Rates = Test Year Customer #s or Volume x Test Year Rates



Test Year: Residential Customer Annual Bill

Annual Bill: Typical Residential Customer
Annual Consumption 3,000

	Unit Rates	Volume	Annual	%
	c/m3	m3	Charges	Total
			\$	Bill
Distribution Service:				
Monthly Charge	\$ 8.03	12 Bills	96.37	7%
Delivery Charge	0.10	3,000	292.03	22%
Subtotal a)			388.41	
Upstream Costs (Pass Through):				
Service:				
Storage Charge	0.02	3,000	45.92	4%
Transportation Charge	0.04	3,000	120.00	9%
Gas Supply Charge	0.25	3,000	750.00	58%
Subtotal b)			915.92	
Total Charges: a) + b)			1,304.33	100%

Test Year: Residential Annual Rate & Bill Impact

Typical Residential Customer: Annual Rate and Bill Impact
Annual Consumption 3,000

	(TEST) \$	(BASE) \$	CHANGE \$	%
Distribution Service:				
Monthly Charge	96.37	94.50	1.87	2.0%
Delivery Charge	292.03	283.50	8.53	3.0%
Subtotal a)	388.41	378.00	10.41	2.8%
Upstream Costs (Pass Through):				
Service:				
Storage Charge	45.92	45.92	0.00	0.0%
Transportation Charge	120.00	120.00	0.00	0.0%
Gas Supply Charge	750.00	750.00	0.00	0.0%
Subtotal b)	915.92	915.92	0.00	0.0%
Total Charges: a) + b)	1,304.33	1,293.92	10.41	0.8%
Distribution Unit Rate	0.1295	0.1260	0.0035	2.8%
Total Unit Rate	0.4348	0.4313	0.0035	0.8%



2) Illustrative Example: Green Charges Residential Annual Rate & Bill Impact

Typical Residential Customer: Annual Rate and Bill Impact
Annual Consumption 3,000

	(TEST)	(BASE)	CHANGE	
	\$	\$	\$	%
Distribution Service:				
Monthly Charge	96.37	94.50	1.87	2.0%
Delivery Charge	292.03	283.50	8.53	3.0%
Subtotal a)	388.41	378.00	10.41	2.8%
Upstream Costs (Pass Through):				
Service:				
Storage Charge	45.92	45.92	0.00	0.0%
Transportation Charge	120.00	120.00	0.00	0.0%
Gas Supply Charge	750.00	750.00	0.00	0.0%
Subtotal b)	915.92	915.92	0.00	0.0%
Green Charge = 0.5 c/m³	c) 15.00	0.00	15.00	n/a
Total Charges: a) + b) + c)	1,319.33	1,293.92	25.41	2.0%
Distribution Unit Rate	0.1295	0.1260	0.0035	2.8%
Total Unit Rate	0.4398	0.4313	0.0085	2.0%



Carbon and Green Charges

- Proceeds from carbon or green charges are invested by governments in projects that reduce green house emissions and help save energy, such as:
 - ✓ public transit,
 - ✓ clean technology innovation for industry,
 - ✓ electric vehicle incentives,
 - ✓ and incentives to retrofit buildings.

Incentive Regulation (IR)

Rate Setting

- Approaches to price setting in IR
 - Custom IR
 - Revenue cap (cap on revenue requirement)
 - Price cap

Note: Rate setting under a custom IR plan is the same as in cost-of-service

Custom (IR) Model

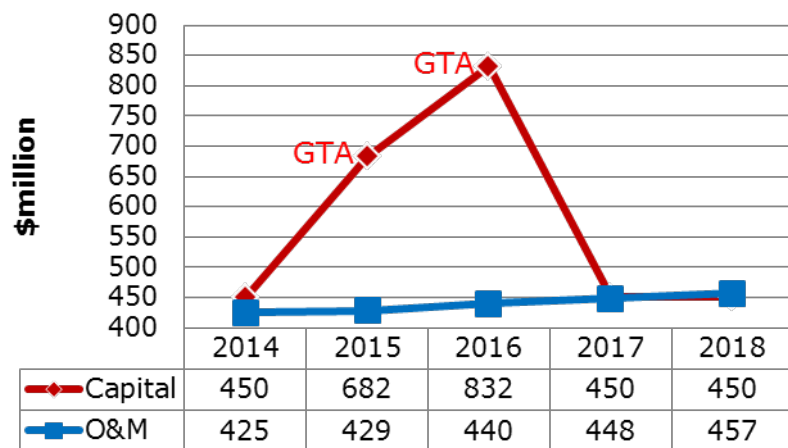
Term

5 years (2014 - 2018)

Revenue Requirement

Locked-in for IR period - based on detailed build up of various cost elements

Spending envelope fixed for each year of the IR term



Capital

Capital overspend will be unrecoverable until rebasing

O&M

O&M overspend will be unrecoverable
(except for CIS/Customer Care, DSM)

Incentive Regulation (IR) Rate Setting

- Rates or Revenue Requirement based on a IR formula (i.e. no longer need to file costs under IR for the purpose of setting rates)
- For example, about 15 Enbridge witnesses involved in each IR rate adjustment proceeding
- Utility success in IR achieved through:
 - Cost containment and (capital and O&M) efficiencies
 - i.e. costs cannot increase faster than revenues
 - Adding profitable customers
 - i.e. marginal revenue > marginal cost
- Customers receive efficiency through the productivity adjustment / stretch factor in the IR formula

4) Illustrative Example: IR Revenue Cap

Test Year Forecast:

- No change in gas supply, transportation unit rates and no change in storage costs
- Customer growth = 2%
- Average use decline = 1%
- Inflation forecast at 3%
- Revenue Cap Formula (pre-determined):
 - Productivity stretch = $\frac{1}{2}$ rate of inflation
 - Base year revenue requirement escalated by 1.5%

Test Year: Revenue Cap

Change in Revenue Requirement

Revenue Requirement

Item	Test Year \$ M	Base Year \$ M	Change \$ M	%	
Natural Gas Cost	2264.85	2,250.00	14.85	0.7%	\$17.23 M
Upstream Transportation Cost	362.38	360.00	2.38	0.7%	
Storage Cost	82.00	82.00	-	0.0%	
O&M	304.50	300.00	4.50	1.5%	\$9.45 M
Depreciation	101.50	100.00	1.50	1.5%	
Taxes	30.45	30.00	0.45	1.5%	
r(RB)	203.00	200.00	3.00	1.5%	
Total	3348.68	3,322.00	26.68	0.8%	

Summary:

Year-Over-Year Change in Revenue Requirement = \$26.68 M (0.8% Increase)

i) Upstream Costs (Pass Through) = \$17.23 M (0.7% Increase)

ii) Distribution Costs = \$9.45 M (1.5% Increase as per Revenue Cap Formula)



Test Year: Revenue Cap Rate Design

Rate Design in Revenue Cap Regulatory Regime:

- The key difference vs. cost-of-service is in determination of revenue requirement
 - Revenue requirement established based on grass-root budgets in cost-of-service regulatory regime
 - Revenue requirement established based on a pre-determined formula in revenue cap regulatory regime
- Annual forecasts of customer numbers, volumes, peak demand, etc. required
- Cost allocation same as in cost-of-service
- Rates designed to recover allocated costs by rate class

Test Year: Revenue Cap

Residential Customer Annual Bill

Typical Residential Customer: Annual Rate and Bill Impact

Annual Consumption 3,000

	(TEST)	(BASE)	CHANGE	
Distribution Service:	\$	\$	\$	%
Monthly Charge	94.97	94.50	0.47	0.5%
Delivery Charge	287.78	283.50	4.28	1.5%
Subtotal a)	382.75	378.00	4.75	1.3%
Upstream Costs (Pass Through):				
Service:				
Storage Charge	45.92	45.92	0.00	0.0%
Transportation Charge	120.00	120.00	0.00	0.0%
Gas Supply Charge	750.00	750.00	0.00	0.0%
Subtotal b)	915.92	915.92	0.00	0.0%
Total Charges: a) + b)	1,298.67	1,293.92	4.75	0.4%
Distribution Unit Rate	0.1276	0.1260	0.0016	1.3%
Total Unit Rate	0.4329	0.4313	0.0016	0.4%



5) Illustrative Examples: IR Price Cap

Test Year Forecast:

- No change in gas supply, transportation unit rates and no change in storage costs
- Inflation forecast at 3%
- Price Cap Formula (pre-determined):
 - Productivity stretch = 1.74 of the rate of inflation
 - Base year rates escalated by 1.26%
- Annual forecasts of customer numbers, volumes, peak demand, etc. no longer required for design of monthly and delivery charges

Test Year: Price Cap Rate Design

Existing (i.e. Base Year) Rates:

Item / Rate Class	Residential \$/m ³	Commercial \$/m ³	Industrial \$/m ³	
Gas Supply Charge	0.2500	0.2500	0.2500	
Transportation Charge	0.0400	0.0400	0.0400	
Storage Charge	0.0153	0.0074	0.0046	
Monthly Charge	\$ 7.97	\$ 39.87	\$ 13,289.98	} See Note
Delivery Charge	0.0957	0.0478	0.0159	

Note: Base year rates escalated by 1.26% as per Price Cap Formula

Test Year: Price Cap

Residential Customer Annual Bill

Typical Residential Customer: Annual Rate and Bill Impact
Annual Consumption 3,000

	(TEST)	(BASE)	CHANGE	
Distribution Service:	\$	\$	\$	%
Monthly Charge	95.69	94.50	1.19	1.3%
Delivery Charge	287.06	283.50	3.56	1.3%
Subtotal a)	382.75	378.00	4.75	1.3%
Upstream Costs (Pass Through):				
Service:				
Storage Charge	45.92	45.92	0.00	0.0%
Transportation Charge	120.00	120.00	0.00	0.0%
Gas Supply Charge	750.00	750.00	0.00	0.0%
Subtotal b)	915.92	915.92	0.00	0.0%
Total Charges: a) + b)	1,298.68	1,293.92	4.76	0.4%
Distribution Unit Rate	0.1276	0.1260	0.0016	1.3%
Total Unit Rate	0.4329	0.4313	0.0016	0.4%

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