Regulatory Course

Cost Allocation

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OVERVIEW

What?

Why?

When?

Who?

How?

Core Steps of Utility Ratemaking Process

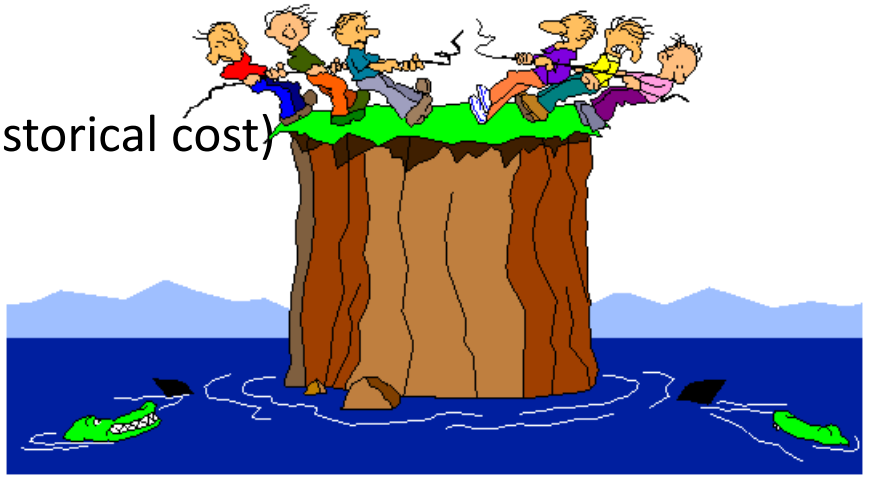
Revenue Requirement

Cost Allocation

Rate Design

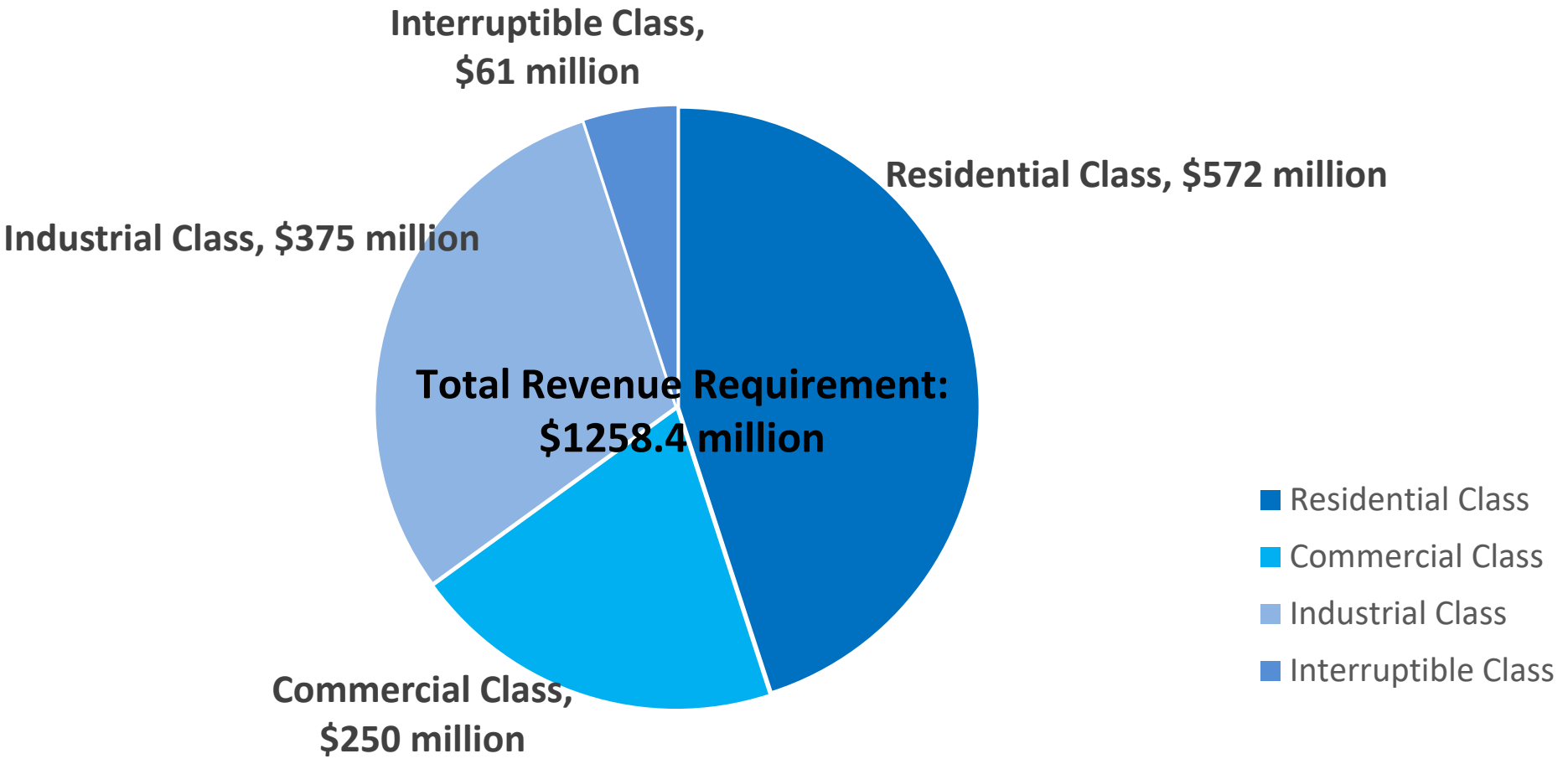
WHAT?

- Allocation of the revenue requirement to various customer classes in a fair and equitable manner
- Challenges
  - Most costs are common (shared)
  - No one definition of "cost":
    - Revenue Requirement (embedded/historical cost)
    - Replacement cost
    - Incremental/marginal cost
    - Market value



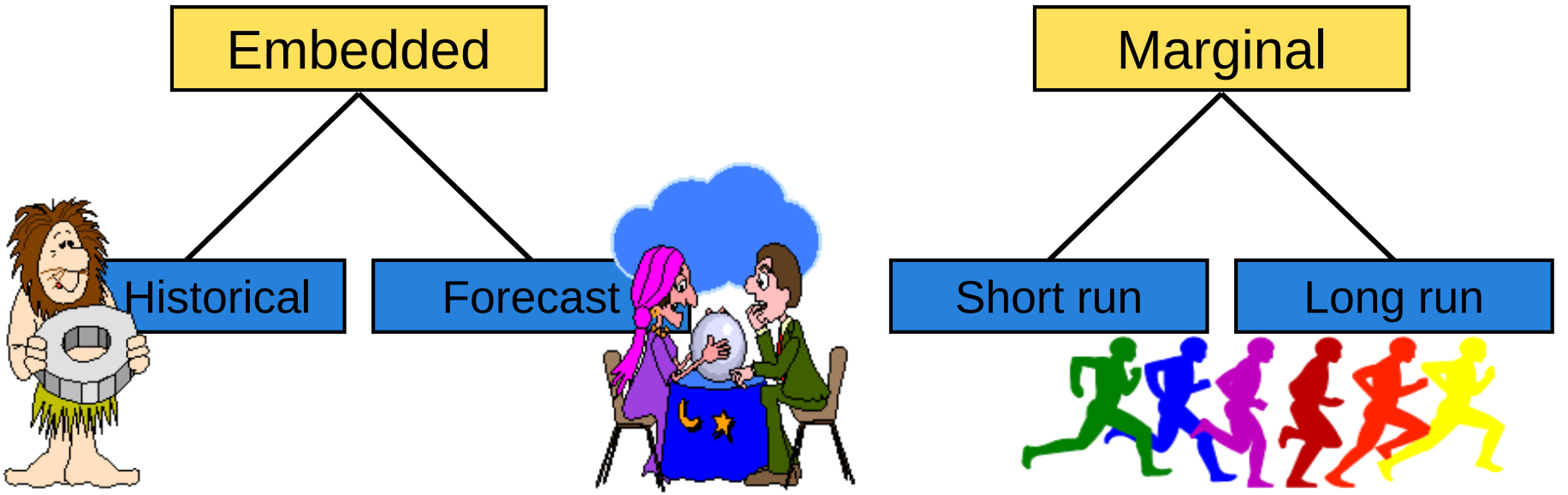
- No one right answer—good judgment has to prevail

WHAT?


Interruptible Class, $61 million
Residential Class, $572 million
Industrial Class, $375 million
Total Revenue Requirement: $1258.4 million
Commercial Class, $250 million
Residential Class
Commercial Class
Industrial Class
Interruptible Class

WHAT?

Types of Cost Allocation Studies



WHY?

Why does the Utility care about Cost Allocation?

- Indifferent once Revenue Requirement established?
- Why not let customers/intervening parties determine?

- Provides a benchmark by which the adequacy of rates is assessed by class
- Regulators are mandated by statue to establish just and reasonable (fair and equitable) rates for utilities
- Regulation a proxy for competition:
  - COS attempts to compile data in such a way to reveal economic importance of services
  - As close as possible reflect competitive market conditions

WHY?

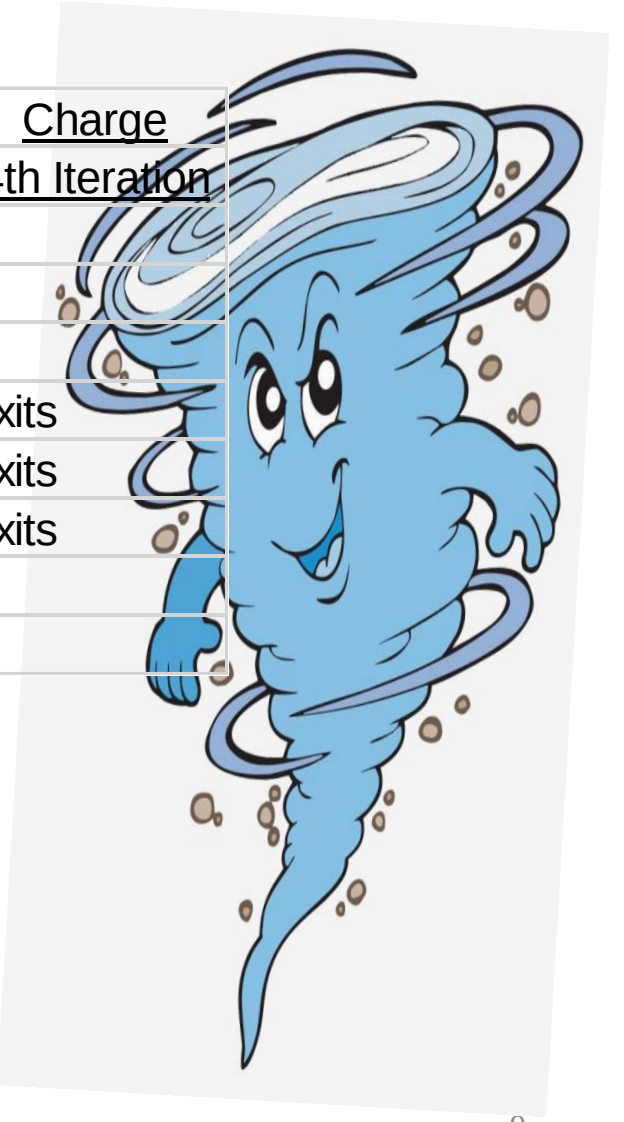
If we simply assigned costs on a proportionate basis consider:

- IT department costs $100,000/mth
- 5 departments are provided service on an equal basis
- Current allocation is $20,000/mth to each

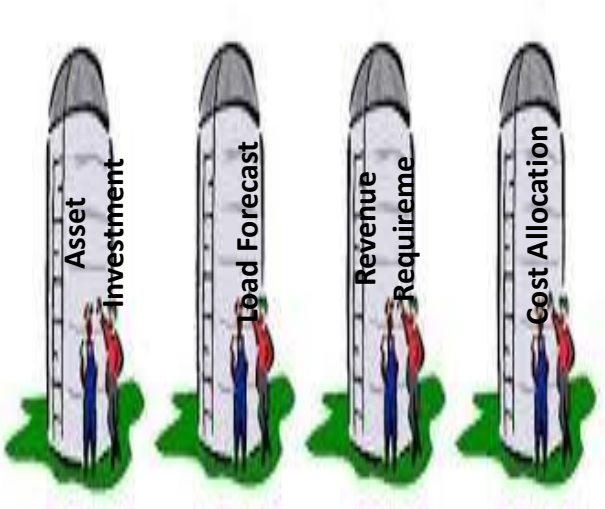
Dept.	Outside Cost	Charge	Result
A	$18,000	$20,000	Unhappy, wants out
B	$22,000	$20,000	Happy
C	$30,000	$20,000	Happy
D	$30,000	$20,000	Happy
E	$30,000	$20,000	Happy
Total	$130,000	$100,000	

WHY?

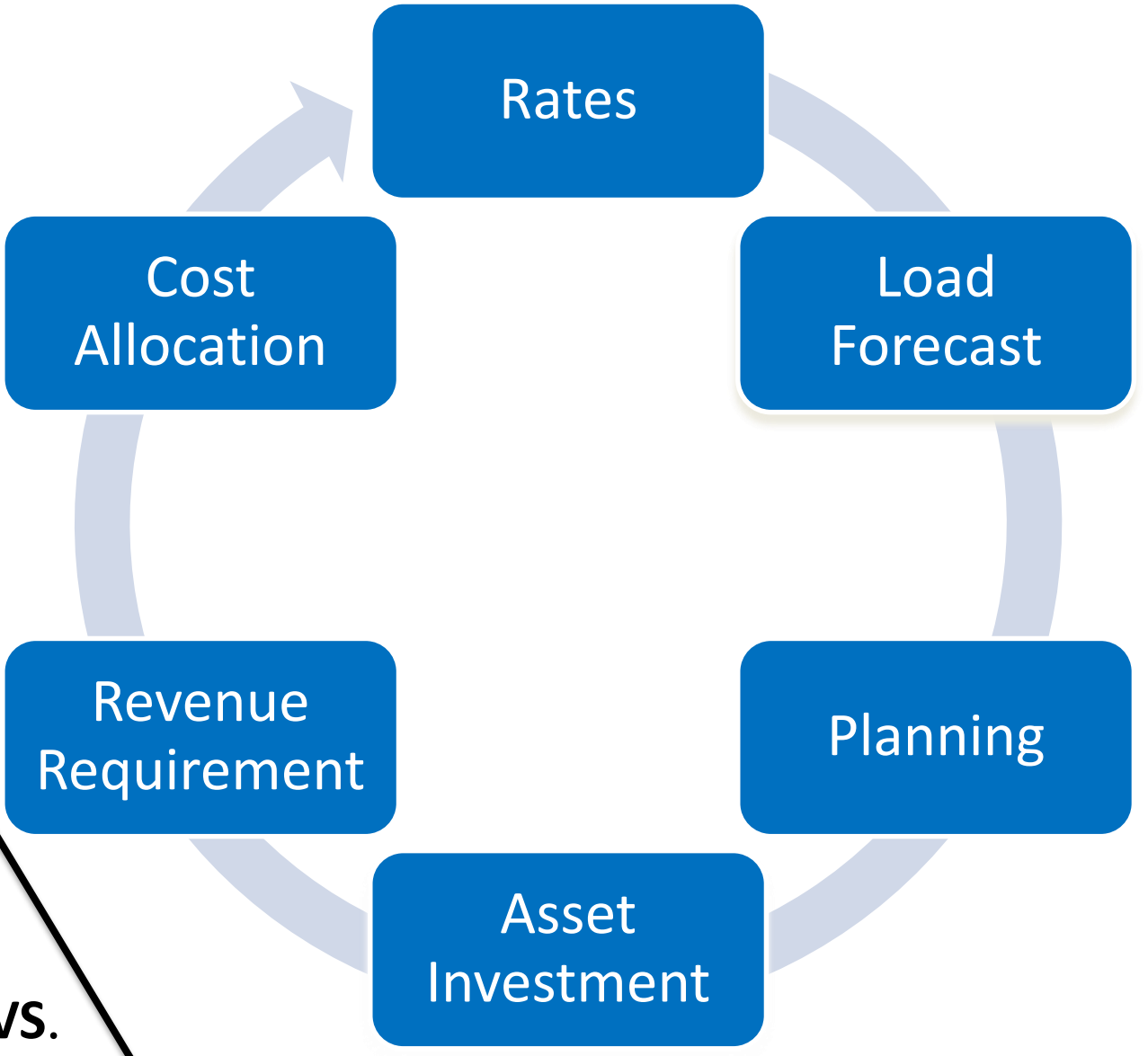
Dept.	Outside Cost	Charge 1st Iteration	Charge 2nd Iteration	Charge 3rd Iteration	Charge 4th Iteration
A	$18,000	$20,000	exits		
B	$22,000	$20,000	$25,000	exits	
C	$30,000	$20,000	$25,000	$33,333	exits
D	$30,000	$20,000	$25,000	$33,333	exits
E	$30,000	$20,000	$25,000	$33,333	exits
Total	$130,000	$100,000	$100,000	$100,000	



WHY?


Asset Investment
Load Forecast
Revenue Requireme
Cost Allocation

VS.

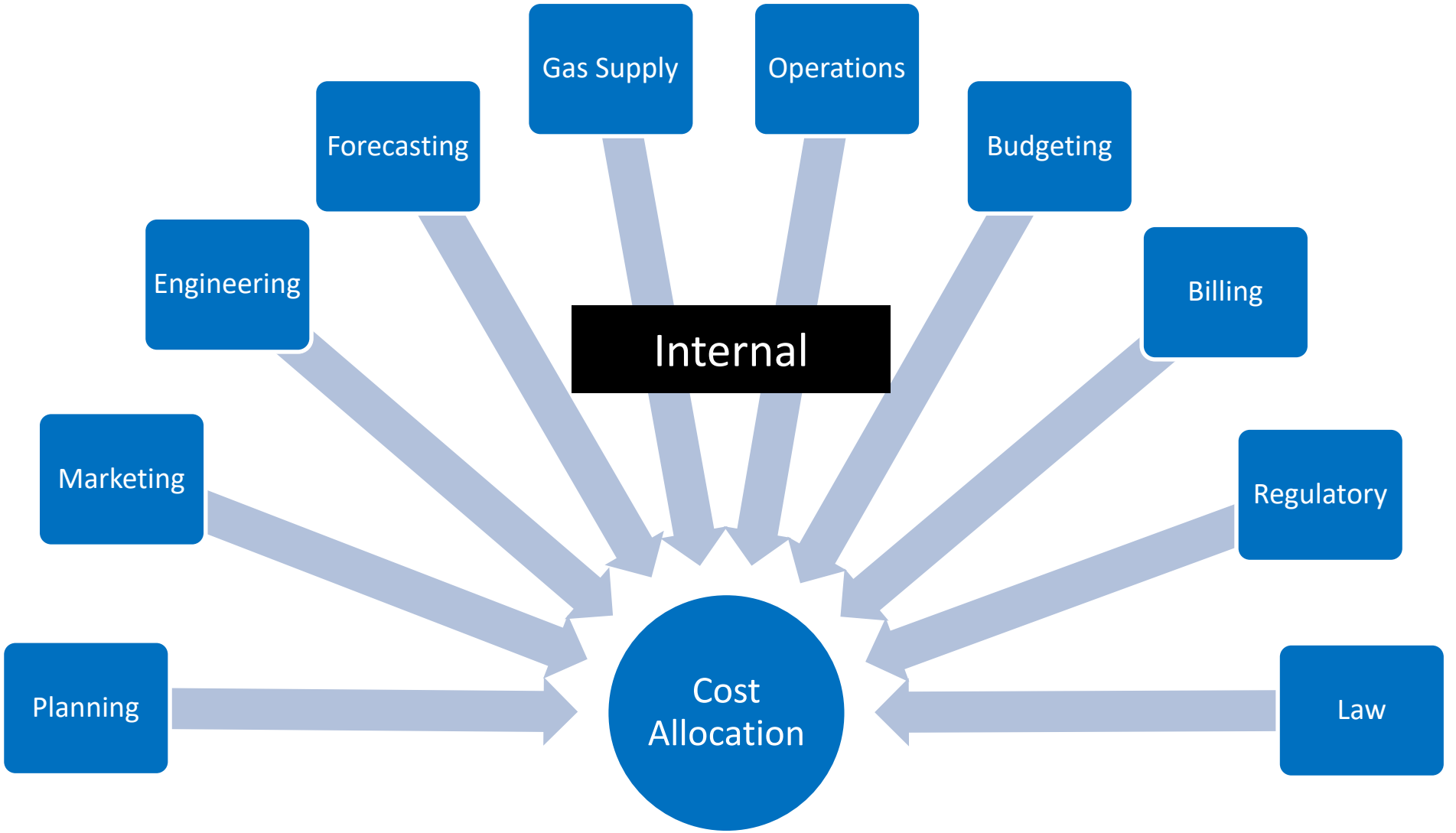

Rates
Load Forecast
Planning
Asset Investment
Revenue Requirement
Cost Allocation

WHEN?

When/how often should a cost allocation study be prepared?

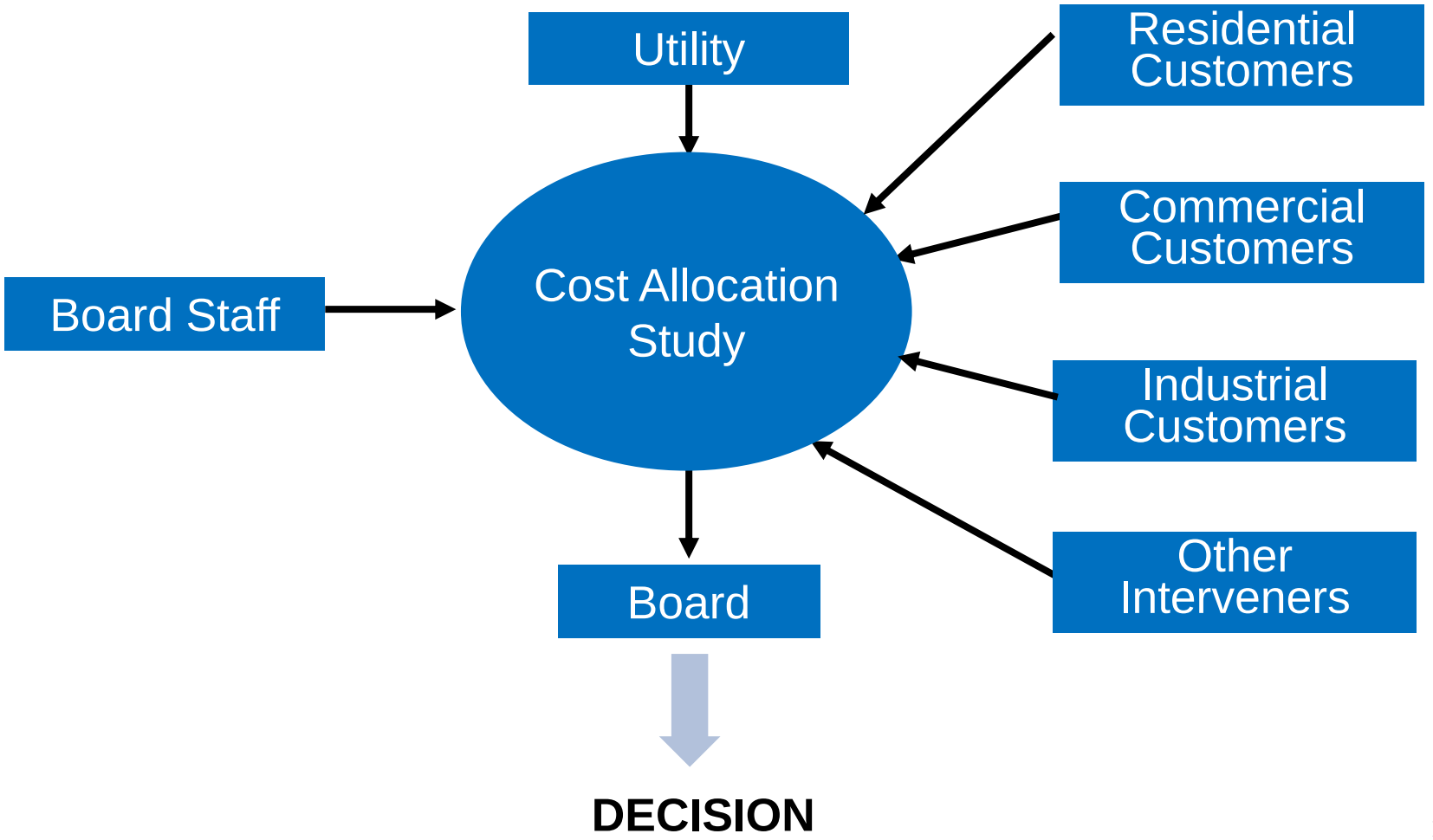
- Are results the primary vehicle for determining the overall cost responsibility and rates for customer classes or strict adherence?
  - Zone of Reasonableness or Unity?
- Relatively stable operating conditions or fluid/volatile conditions?
  - Significant changes in customers, volumes, demand
  - Large capital additions?
  - Other – IFRS, significant deferral accumulations
- PBR?
- Past practice
- Legislated requirement/PUB direction

WHO?


Gas Supply
Operations
Forecasting
Budgeting
Engineering
Billing
Internal
Marketing
Regulatory
Planning
Cost Allocation
Law

WHO?

External



HOW?

- Traditional ratemaking goals:
  - Recovery of Revenue Requirement
  - Fairness and Equity
  - Economic Efficiency
  - Rate Stability and Gradualism
  - Simplicity/practicality

- Other: social and environmental policy has, over the last couple of decades, become comingled with the regulation of utilities

HOW?

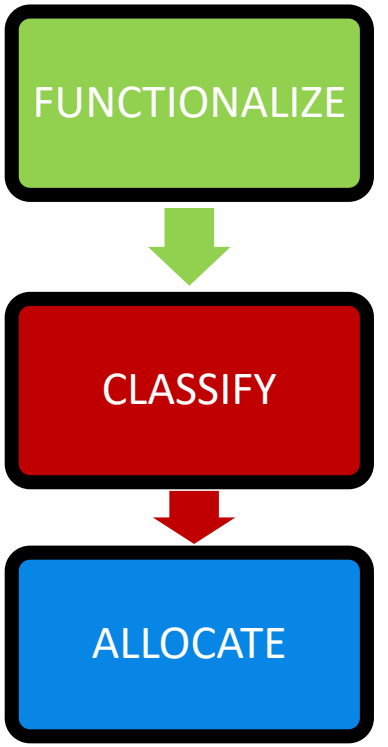
Cost Allocation Goals?

- Postage Stamp ratemaking?
- Cost Causation
  - Is “primary” objective is to select a cost allocation method which best represents cost causation or “sole” objective?
  - Having regard for why costs are incurred
  - Intent/role of investment

COS, like any project, it is important to begin with an end in mind

- A well-designed cost allocation study strikes a balance of a utility’s ratemaking objectives of greatest significance
- Cost Allocation methodology often not right or wrong per se—but proper or improper measured in terms of how it aids in achieving ratemaking objectives
- Transparency important

HOW?



Key Question to be asked at each step in process:

What caused costs to be incurred?

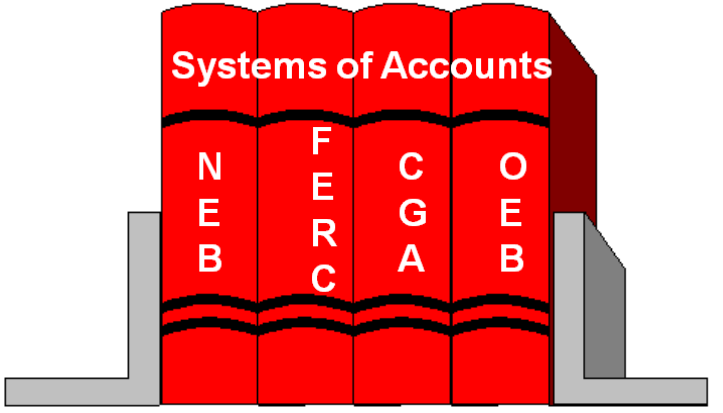
Step 1: Functionalization

Purpose is to divide costs into broad functions, activities or services according to the operating functions of the utility

- To ensure that customer classes only allocated costs of functions used
- Accounting records generally organized in terms of functions
- **Directly assign where possible**

Common functions:

- Production (Gas supply/Molecule)
- Pipeline
- Storage
- Transmission
- Distribution
- Onsite



Does investment perform more than one function?

- Interface between functions
- What is role of a Town Border Station?

General plant?

- General plant supports indirect labour, indirect labour supports direct labour
- In proportion with functionalization of assets

Step 1: Functionalizing the Revenue Requirement

- Purchased Gas Costs
- Operations, Maintenance, Admin (OM&A)
- Depreciation and Amortization (incl. DSM)
- Financing Charges
- Return on Equity (ROE)
- Taxes
- Misc. Revenue

Capital related costs

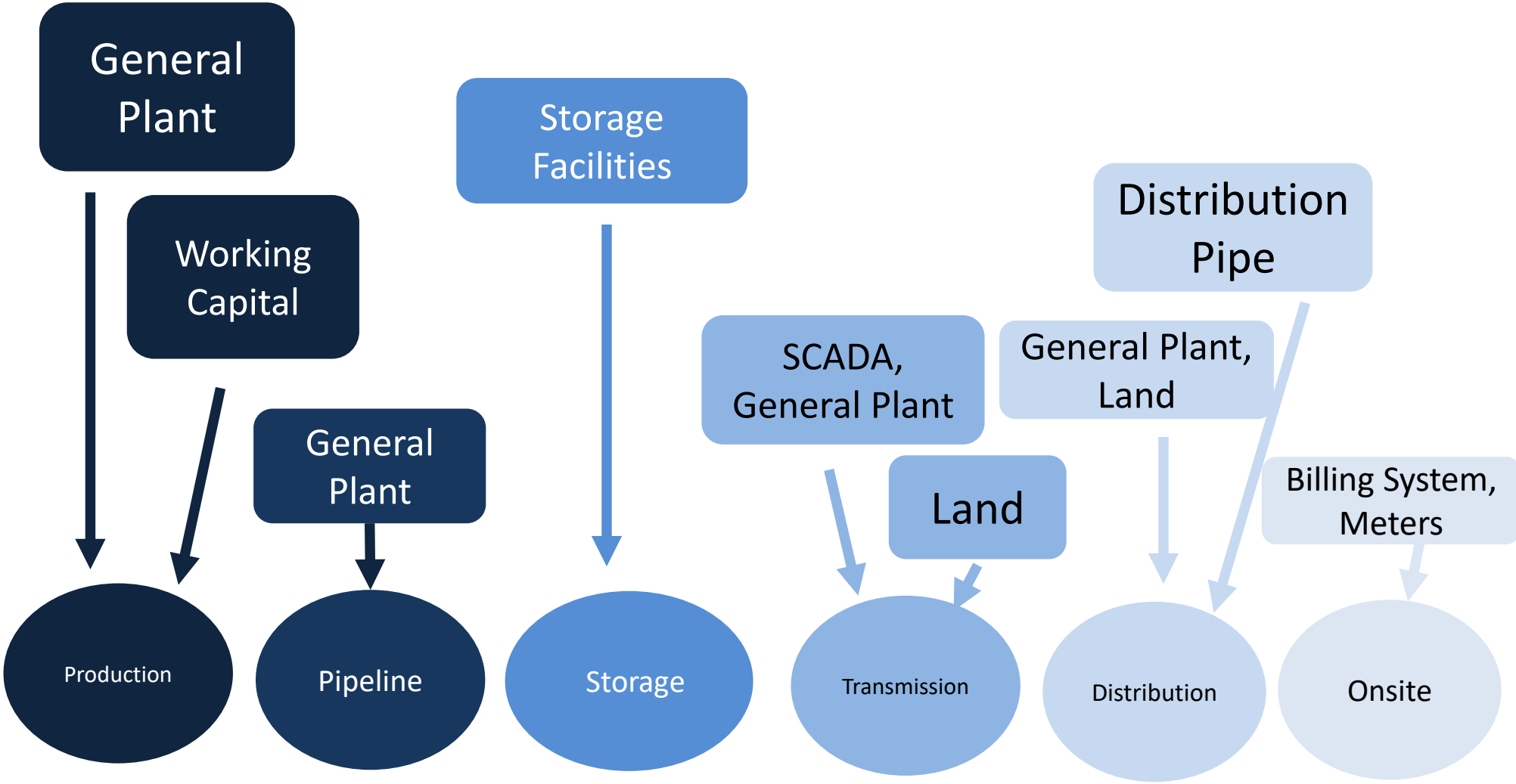
Step 1: Functionalization

- Usually, rate-base (capital expenditures) is functionalized first
- Then the expense components (i.e revenue requirement)

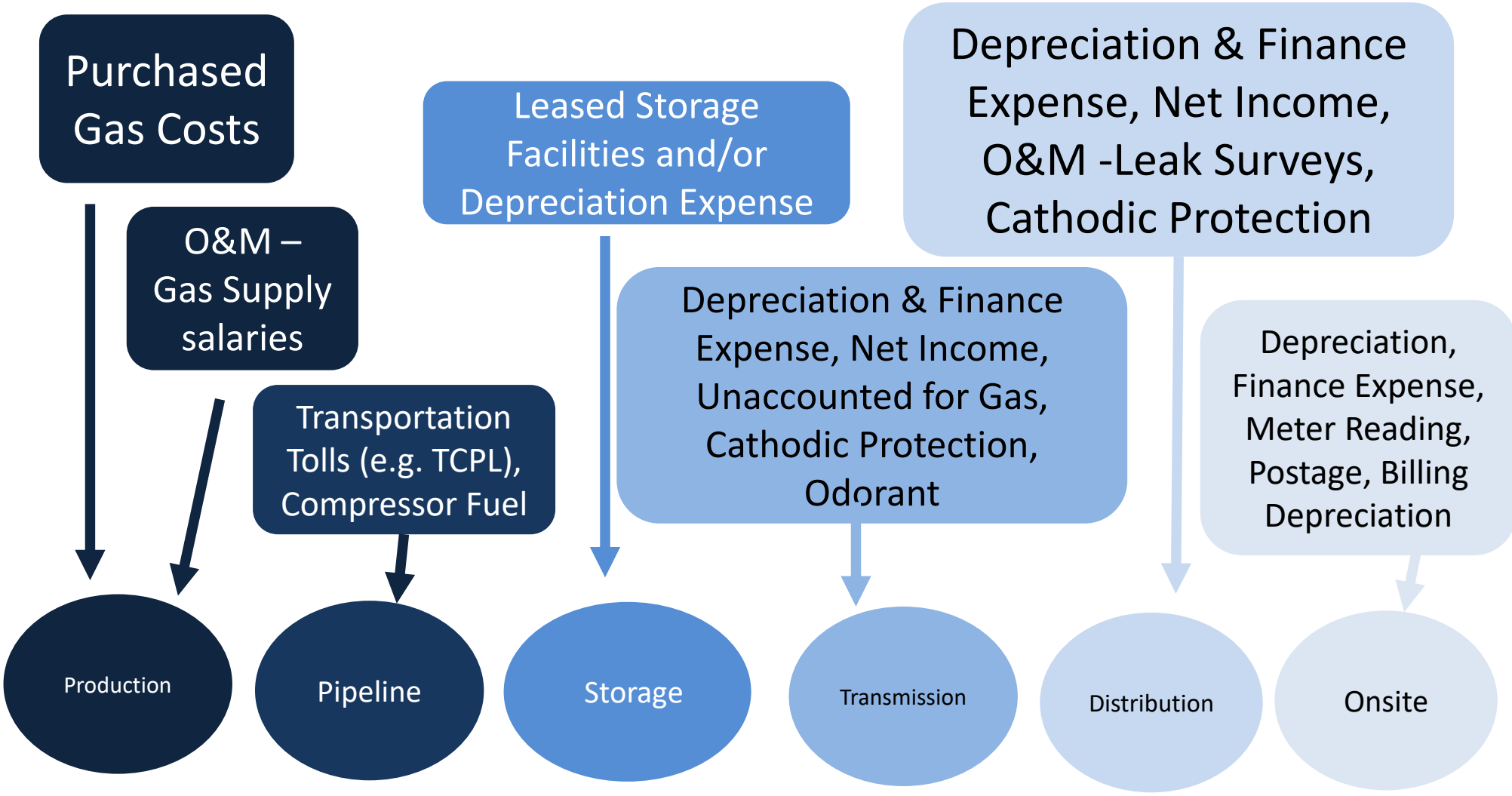
PPE less Accum Dep

- Land
- Transmission Plant (e.g. lines and substations)
- Distribution Plant (e.g lines and substations)
- General Plant (e.g. vehicles, computers, SCADA)
- Meters & Regulation
- Working capital
- AFUDC and/or CWIP etc.

Step 1: Functionalizing Rate Base



Step 1: Functionalizing Revenue Requirement



Step 2: Classification

Classification is the process of further separating the functionalized costs by the primary driver for that cost:

- What are the drivers of cost i.e. what are the costs sensitive to?
- Primary Cost Classifications:

Volume – costs that vary with energy required by customers

Demand – costs incurred to meet energy needs at peak periods

i.e. costs incurred to meet a customer's energy needs not over the year, but in every hour of the year

Customer numbers – cost incurred to attach a customer to the system

Methodology chosen gives consideration to:

- Why investment made/Intent of infrastructure/role of infrastructure
- What are goals of cost allocation and overall in ratemaking
- How methodology corresponds to the utility's planning process
- Data availability
- What others in the industry do
- How do results compare to current - significant difference may be met with resistance

Step 2: Classification Examples

Customer-related costs

- Billing
- Customer calls
- Postage stamps
- Meters, regulators - these costs show up in Rate Base and will be used to drive the classification of Depreciation, O&M, Finance & Net Income

Commodity-related costs

- Gas Supply (molecules)
- Compressor fuel
- Unaccounted For Gas?

Demand-related costs:

- Transmission Mains (Rate Base)
- Distribution Mains (Rate Base)
- TCPL fees
- Storage

Step 2: Classification

Classification of mains tends to be highly controversial

Two types of main costs:

Transmission - a customer not directly attached

Distribution - what purpose does Distribution Main serve?

- Provides sufficient capacity to meet peak requirements of customer
- Sufficient length to attach customer
- Cost driven only by size of plant, therefore costs treated entirely as demand?

Common methods for splitting the demand and customer related components of distribution mains:

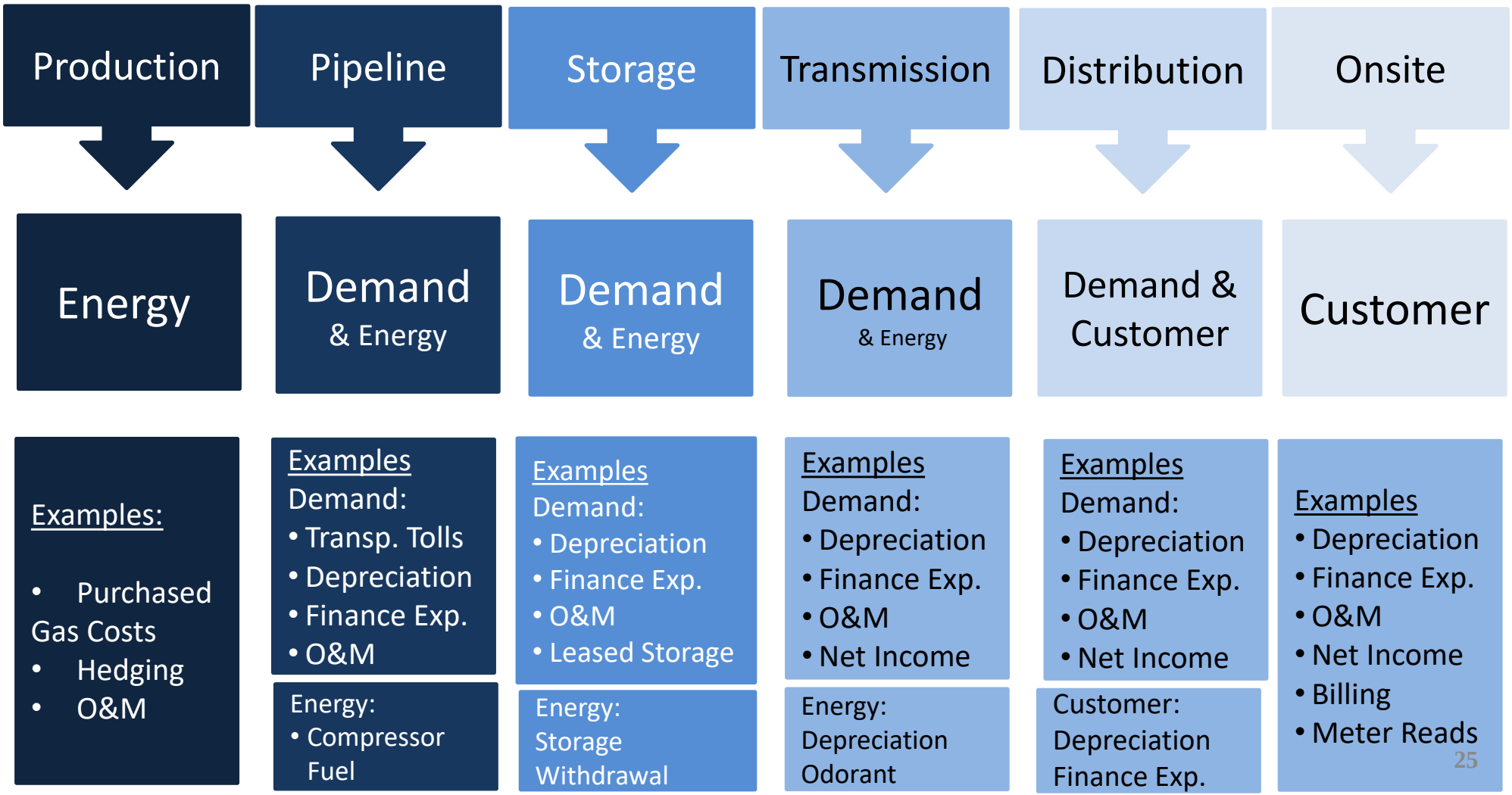
Minimum Plant

- Provides an estimate of the minimum sized plant needed to connect customers to the transmission system

Zero Intercept

- Estimates the cost of connecting customers to the transmission system using a hypothetical zero diameter pipe

Step 2: Classification of Functionalized Costs



Step 3: Allocation

Allocation is the process of allocating revenue requirement among rate classes

What is a rate class?

- A relatively homogeneous group of customers with similar service characteristics
- Characteristics include annual use, load (demand), end use, delivery pressure, metering
- Can depend on goals to be achieved (i.e residential vs. similar small commercial)

Examples:
- Residential
- Commercial
- Industrial firm
- Industrial interruptible

Step 3: Allocation

Costs incurred for a customer or rate class known as dedicated facilities and should be directly assigned

Costs incurred that do not serve particular customers/classes should be excluded from the allocation of these costs

Costs are allocated to customer classes:

1. Customer count—weighted or unweighted
2. Annual throughput (volume)—weighted or unweighted
3. Peak Demand (capacity)

Examples of Demand methods include:

- CP: Coincident Peak
- NCP: Non-Coincident Peak
- Peak and Average

Step 3: Allocation

CP (Coincident Peak)

- System designed to meet maximum peak requirements
- Allocates demand/capacity costs based on class use at system peak
- Does not allocate any demand/capacity costs who do not use energy during system peak – eg: interruptible customers

NCP (Non-Coincident Peak)

- Allocates capacity costs on the basis of each customer class' peak
- Inherent assumption is a class is served on a stand-alone basis

Peak & Average

- Capacity costs allocated on a 2-part formula that recognizes both average use of capacity (energy) and use at system peak

Step 3: Allocation

Other Allocators:

Internally Derived

- Labour

Special Studies

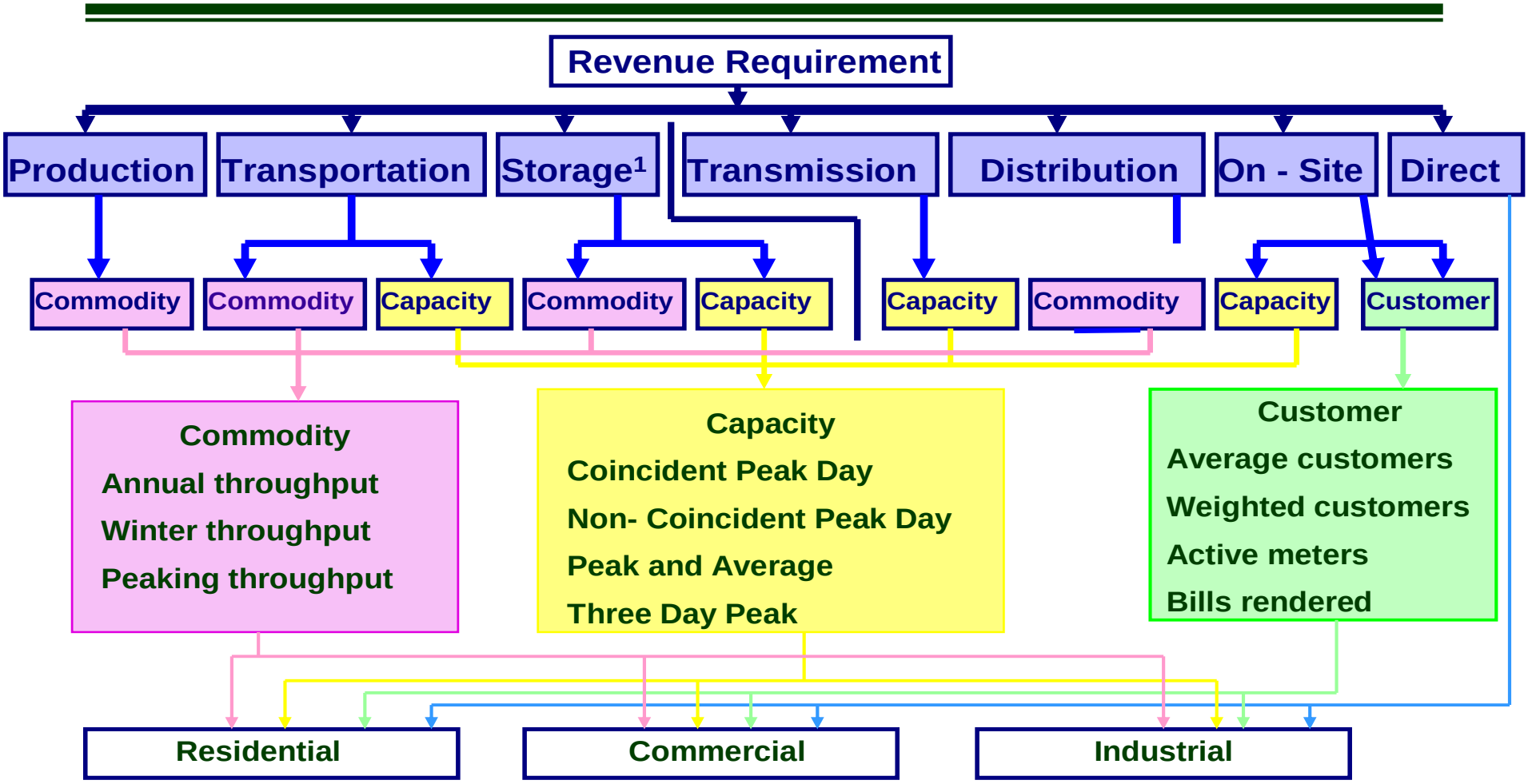
- Call center costs may be allocated based on call data
- Late payments may be allocated based on historical review of revenue collection
- Meter/Service Line Study

Step 3: Allocation

The following criteria should be used to determine the appropriateness of an allocation method:

- The method should reflect the actual planning and operating characteristics of the utility's system
- The method should reflect cost causation, i.e., should be based on the actual activity that the drives a particular cost and on a rate classes' share of that activity
- The method should recognize customer class characteristics such as load demands, peak period consumption, number of customers, and directly assignable costs
- The method should produce stable results on a year-to-year basis
- Customers who benefit from the use of the system should also bear some responsibility for the costs of utilizing the system

HOW?



[1] excludes cost of molecules since these are functionalized as Production

COST ALLOCATION - RESULTS

- Are the outcomes expected?
- If results counterintuitive, why?
- Beware of unintended results
- What are the major drivers of the changes?
- Are results consistent with Corporate direction?
  - Stakeholders—i.e internal, regulator, public
- Start building the Story
  - be aware of heavy academics
- What are the headline issues?

COST ALLOCATION - RESULTS

Are cost allocation results the primary vehicle for determining the overall cost responsibility and rate form for customer classes?

- Cost allocation is a guide, not a prescription
  - Results provide a benchmark by which both overall revenue requirement by class and rate forms are evaluated
  - Cost allocation cannot identify, for certain, the true cost of provide services (common costs)
  - Fairness and Equity and other ratemaking objectives influence utility rates
  - Often utilities accept a range of revenue vs. cost known as a "Range of Reasonableness" or "Zone of Reasonableness" in setting rates

Questions or Clear?

Appendix

Rainkie-Derksen Consulting Practice Overview

CVs: www.pubmanitoba.ca/v1/proceedings-decisions/appl-current/pubs/2019-centra-gra/cac-ex/cac-intervenor-application.pdf

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STRATEGIC & INNOVATIVE REGULATORY SOLUTIONS FOR THE EVOLVING CHALLENGES OF REGULATED ENTERPRISES

EXPERIENCE HIGHLIGHTS

Executive level Experience
- Strategic Plan Development
- Leading & developing senior level professionals
- Successfully managing multiple initiatives/projects simultaneously

Financial Management
Broad senior level experience:
- Operating & Capital Budgeting
- Financial Forecasting
- Corporate Finance
- Financial Reporting
- Corporate Risk Management

Rates & Regulatory Expertise
- Policy & Strategy
- Planning & Process Management
- Revenue Requirement
- Cost of capital/Capital Structure
- Major Capital Project Reviews
- Cost allocation & Rate design
- Testimony

Leadership & Communication
- Providing Policy Direction
- Leading, collaborating in cross-disciplinary teams
- Effective communication with internal and external stakeholders

PRACTICE OVERVIEW

Through an energy regulation consulting practice that was founded in 2017 – we offer services to a wide range of clients that participate in and are impacted by regulatory proceedings and decisions including applicants, consumer groups, regulatory tribunals, government agencies and energy industry participants in general. Our focus is primarily in the electricity and natural gas sectors.

We have a unique combination of experience in energy regulation (55 years), utility and financial management which was developed through decades of prior employment in a large crown-owned integrated electricity and natural gas distribution utility, a privately-owned natural gas distribution utility, and through providing advisory services to a provincial regulator and other clients.

We leverage from our decades of hands-on senior level utility and regulatory experience, passion for the energy sector, and our collaborative approach to develop strategic and innovative regulatory solutions that are broad-based, sustainable and practical - for clients - so that they can meet the evolving challenges of regulated enterprises.

We provide a full suite of services that spans the entire regulatory cycle depicted below:

Rainkie-Derksen Practice Overview Continued

REGULATORY CYCLE

REGULATORY SERVICES

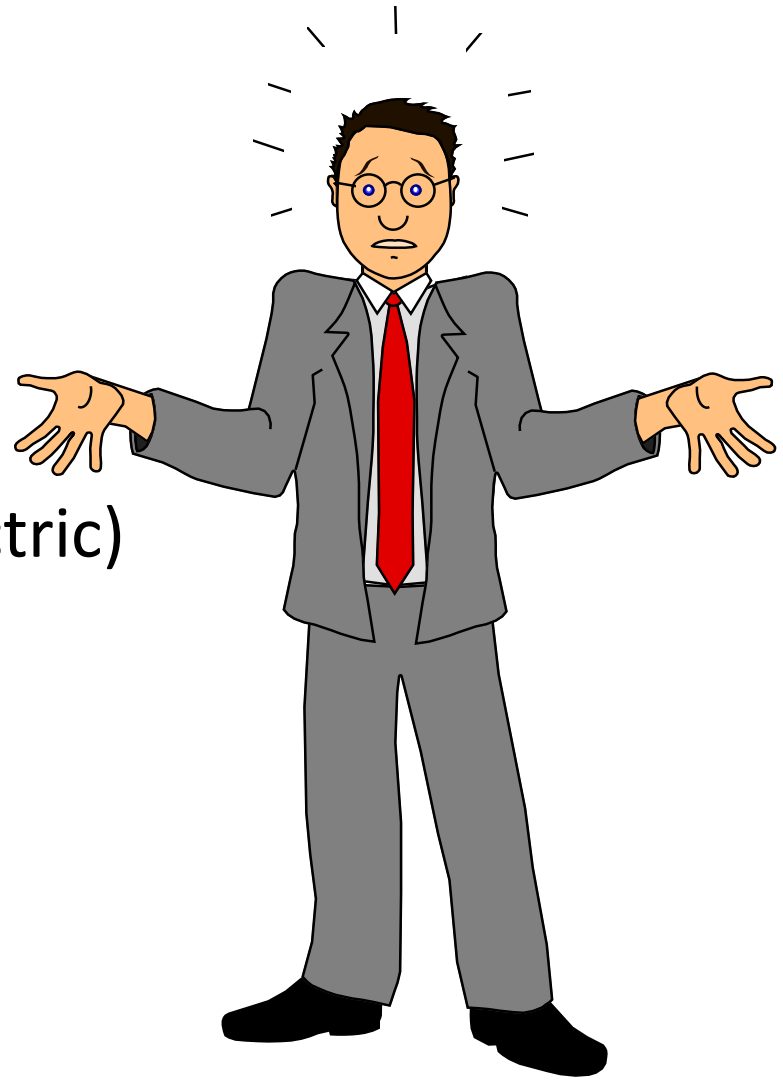
- Strategy development and case planning
- Application and evidence preparation
- Stakeholder engagement and dispute resolution processes
- Witness training and preparation
- Discovery and hearing process managemen
- Presentation of expert testimony
- Evidence evaluation
- Cross-examination and argument strategy and content
- Regulatory decision drafting
- Compliance filing preparation and evaluatic
- Process improvement recommendations

Appendix

Cost Allocation Practice

IMPORTANT INDUSTRY CONCEPTS

- Annual Load (volumes)
- Load Factor
- Demand
  - Peak Day / Peak period (electric)
  - Coincident (system)
  - Non Coincident (class)
  - Design Day



DEMAND/LOAD FACTOR/ANNUAL VOLUME

peak day = 28 m^3

Load Factor = (3380/365)/ 28 = 33%

annual volume = 3,380 m^3

CLASSIFY – ZERO INTERCEPT METHOD

Example:

Classification of distribution plant between capacity and customer using zero intercept method where total distribution main = $300 000

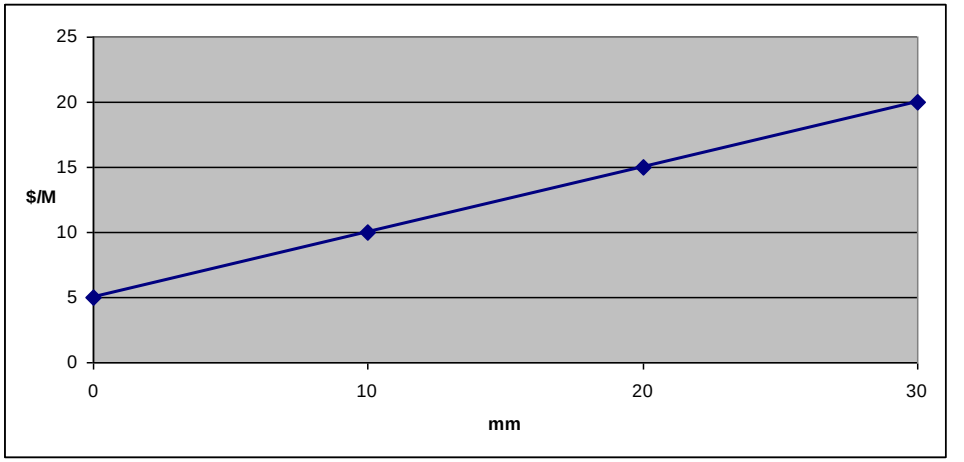
Data

DIAMETER (mm)	LENGTH (M)	COST ($)	$/M
10	1,000	10,000	10
20	6,000	90,000	15
30	10,000	200,000	20
Total	**17,000**	**300,000**	

CLASSIFY

Distribution Customer cost

DIAMETER mm	$/M
10	10
20	15
30	20



Using a regression, we calculate the cost of a distribution main with zero diameter to be $5/M

Distribution Customer cost = 17,000M X $5/M = $85 000

CLASSIFY

Distribution Capacity cost

Distribution Main =

Distribution Customer cost +Distribution Capacity cost

$300 000 =

$85 000 + Distribution Capacity cost

Distribution Capacity cost = $215 000

ALLOCATE

Distinction between Non-coincident peak and Coincident peak:

- If a peak is observed for each customer, the term *non-coincident peak* is used, as each peak does not necessarily occur on the same day.
- If the volumes of all customers are added and a peak is calculated, the term *coincident peak* is used.

Volumes (m^3)

	Day 1	Day 2	Day 3	Day 4	Non-coincident peak
CUSTOMER 1	10	7	6	20	20
CUSTOMER 2	15	25	4	16	25
TOTAL	25	32	10	36	

COINCIDENT PEAK FOR THE SYSTEM = 36

EXAMPLE

FUNCTIONALIZE

Example Step 1: Functionalization

Acct Description	Total ($)	Direct	Derived	Production	Pipeline	Storage	Transmission	Distribution	Onsite
Rate Base									
Transmission Mains	200,000	x					200,000		
Distribution Mains	300,000	x						300,000	
Meters	50,000	x							50,000
Services	100,000	x							100,000
Total	**650,000**						**200,000**	**300,000**	**150,000**
Revenue Requirement									
Molecules	2,000,000	x		2,000,000					
TCPL Demand Charges	200,000	x			200,000				
Storage Capacity Charge	100,000	x				100,000			
O & M									
Billing	20,000	x							20,000
Bad Debt	10,000	x							10,000
System Integrity	20,000		x				8,000	12,000	
Return	50,000		x				15,400	23,100	11,500
Total Revenue Requirement	**2,400,000**			**2,000,000**	**200,000**	**100,000**	**23,400**	**35,100**	**41,500**

FUNCTIONALIZE

Acct Description	$	Allocation		Transmission	Distribution	Onsite	Total
System Integrity	20,000	Mains					
			Trans Mains	200,000	-	-	200,000
			Dist Mains	-	300,000	-	300,000
			Total				500,000
			%	40%	60%		100%
			Allocation	**8,000**	**12,000**		**20,000**
Return	50,000	Rate Base					
			Trans Mains	200,000			200,000
			Dist Mains		300,000		300,000
			Meters			50,000	50,000
			Services	-	-	100,000	100,000
			Total	200,000	300,000	150,000	650,000
			%	31%	46%	23%	100%
			Allocation	**15,400**	**23,100**	**11,500**	**50,000**

CLASSIFY

Example Step 2: Classification

Acct Description	Direct	Derived	Capacity	Commodity	Customer
Rate Base					
Transmission Mains	✔		100%		
Distribution Mains		✔	x%		x%
Meters	✔				100%
Services	✔				100%
Revenue Requirement					
Molecules	✔			100%	
TCPL Demand Charges	✔		100%		
Storage Capacity Charge	✔		100%		
O & M					
Billing	✔				100%
Bad Debt	✔				100%
System Integrity		✔	x%		x%
Return		✔	x%		x%

CLASSIFY

Example Step 2: Classification

Acct Description	Total ($)	Direct	Derived	Capacity	Commodity	Customer
Rate Base						
Transmission Mains	200,000	x		200,000		
Distribution Mains	300,000		x	215,000		85,000
Meters	50,000	x				50,000
Services	100,000	x				100,000
Total	**650,000**			**415,000**		**235,000**
Revenue Requirement						
Molecules	2,000,000	x			2,000,000	
TCPL Demand Charges	200,000	x		200,000		
Storage Capacity Charge	100,000	x		100,000		
O & M						
Billing	20,000	x				20,000
Bad Debt	10,000	x				10,000
System Integrity	20,000		x	16,600		3,400
Return	50,000		x	32,000		18,000
Total	**2,400,000**			**348,600**	**2,000,000**	**51,400**

ALLOCATE - DATA

Example Step 3: Allocation Factors

	Residential	Commercial	Industrial (Firm)	Industrial Interruptible	Total
Data					
Annual Customers	80	15	4	1	100
Annual Volume (M^3)	1,000	6,000	4,000	5,000	16,000
Revenues ($)	160,000	800,000	500,000	640,000	2,100,000
Coincident Peak (M^3)	10	20	16	0*	46
Non-Coincident Peak (M^3)	10	20	21	15	66
Allocation Factors					
Customer	80%	15%	4%	1%	100%
Commodity	6%	38%	25%	31%	100%
CP (Dist Mains)	22%	43%	35%	0%	100%
NCP (Trans Mains)	15%	30%	32%	23%	100%

*For an interruptible customer, we use a coincident peak of zero as the customer is interrupted during peak periods

ALLOCATORS

Example Step 3: Allocation

Acct Description	Total ($)	Residential	Commercial	Industrial (Firm)	Industrial Interruptible
Rate Base					
Transmission Mains	200,000	NCP	NCP	NCP	NCP
Distribution Mains	300,000	CP/Cust#	CP/Cust#	CP/Cust#	CP/Cust#
Meters	50,000	Cust#	Cust#	Cust#	Cust#
Services	100,000	Cust#	Cust#	Cust#	Cust#
Total	**650,000**				
Revenue Requirement					
Molecules	2,000,000	Commodity	Commodity	Commodity	Commodity
TCPL Demand Charges	200,000	NCP	NCP	NCP	NCP
Storage Capacity Charge	100,000	CP	CP	CP	CP
O & M					
Billing	20,000	Cust#	Cust#	Cust#	Cust#
Bad Debt	10,000	Cust#	Cust#	Cust#	Cust#
System Integrity	20,000	T/D Mains	T/D Mains	T/D Mains	T/D Mains
Return	50,000	Rbase	Rbase	Rbase	Rbase
Total	**2,400,000**				

ALLOCATE

Allocation Details

		Residential	Commercial	Industrial (Firm)	Industrial Interruptible
Transmission Mains	NCP	15%	30%	32%	23%
Capacity $	200,000	30,000	61,000	64,000	45,000
Distribution Mains	CP	22%	43%	35%	0%
Capacity $	215,000	47,000	93,000	75,000	-
Distribution Mains	Customer #	80%	15%	4%	1%
Customer $	85,000	68,000	13,000	3,000	1,000
Distribution Mains	Total Alloc.	115,000	106,000	78,000	1,000
Meters	Customer #	80%	15%	4%	1%
Meters $	50,000	40,000	7,500	2,000	500
Tran/Dist Mains RBase		145,000	167,000	142,000	46,000
System Integrity	Mains%	29%	33%	28%	9%
System Integrity $	20,000	5,800	6,700	5,700	1,800
Total Rate Base		265,000	189,500	148,000	47,500
Return	RBase %	41%	29%	23%	7%
Return $	50,000	20,400	14,500	11,400	3,700

ALLOCATE

Example: Peak and Average Calculation (used in Manitoba)

	Residential	Commercial	Industrial (Firm)	Total Firm	Interruptible	Total
Annual Volume	1,000	6,000	4,000	**11,000**	5,000	**16,000**
Peak Day	10	20	16	**46**	0	**46**
% of Peak Day	22%	43%	35%	**100%**		
Load Factor*	27%	82%	68%	**66%**		
% of Annual Volume	6%	38%	25%		31%	**100%**
Peak & Average**	12%	40%	28%		20%	**100%**
****Peak & Average Calc**						
System Load Factor	66%	66%	66%		66%	
% of Annual Volume	6%	38%	25%		31%	
Average	**4%**	**25%**	**16%**		**20%**	
1-System Load Factor	34%	34%	34%		34%	
% of Peak Day	22%	43%	35%		0%	
Peak	**7%**	**15%**	**12%**		**0%**	
Peak & Average	**12%**	**40%**	**28%**		**20%**	

* Load Factor: Annual Volume/365/PeakDay
Total: 11000/365/46 = 66%
Res: 1000/365/10 = 27%

ALLOCATE

Example Step 3: Allocation

Acct Description	Total ($)	Residential	Commercial	Industrial (Firm)	Industrial Interruptible
Rate Base					
Transmission Mains	200,000	30,000	61,000	64,000	45,000
Distribution Mains	300,000	115,000	106,000	78,000	1,000
Meters	50,000	40,000	7,500	2,000	500
Services	100,000	80,000	15,000	4,000	1,000
Total	**650,000**	**265,000**	**189,500**	**148,000**	**47,500**
Revenue Requirement					
Molecules	2,000,000	125,000	750,000	500,000	625,000
TCPL Demand Charges	200,000	30,000	61,000	64,000	45,000
Storage Capacity Charge	100,000	22,000	43,000	35,000	-
O & M					
Billing	20,000	16,000	3,000	800	200
Bad Debt	10,000	8,000	1,500	400	100
System Integrity	20,000	5,800	6,700	5,700	1,800
Return	50,000	20,400	14,500	11,400	3,700
Total	**2,400,000**	**227,200**	**879,700**	**617,300**	**675,800**
Current Revenue	2,100,000	160,000	800,000	500,000	640,000
Required Revenue Increase ($)	300,000	67,200	79,700	117,300	35,800
Required Increase (%)	14%	42%	10%	23%	6%