

# Cost of Service Ratemaking

Michigan Public Service Commission  
Department of Licensing and Regulatory Affairs



MICHIGAN PUBLIC SERVICE COMMISSION

# Regulation Status of Michigan Electric Utilities

- 8 Investor-Owned Electric Utilities (regulated by MPSC)
- 9 Cooperative Electric Utilities
  - 3 rate-regulated by MPSC
  - 6 member-regulated
- 41 Municipal Electric Utilities (not regulated by MPSC)



# General Rate Case Process

- Request for rate increase initiated by utility
- Provides MPSC Staff, other interveners (Attorney General, ABATE, MCAAAA, MEC, etc.) ability to scrutinize requests through contested case proceeding
- MPSC determines final rates

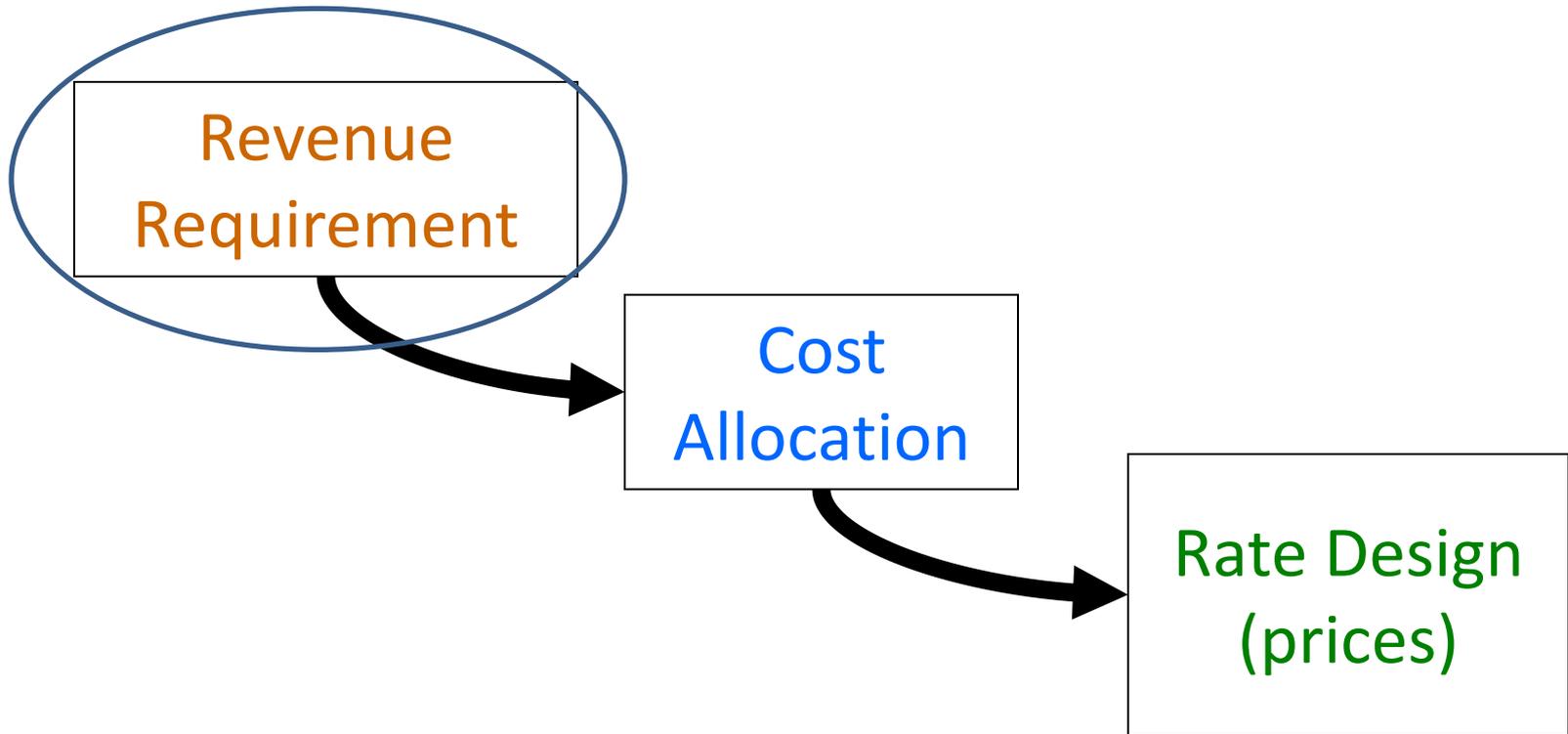


# Rate Development

- Determination of **Revenue Requirement** (cost assessment) for a test year
- **Allocation of Costs** to customer classes based on usage patterns
  - Cost of service study
- **Rate Design** to recover costs through rates and charges



# The Traditional Ratemaking Process



# Revenue Requirements Formula:



$$RR = r(RB) + E + D + T$$

RR (ratemaking) =

$$r(RB) + E + D + T - \text{Other Revenue}$$



# Revenue Requirements Formula:

Revenue Deficiency =

$$r(RB) + E + D + T - \text{Other Revenue} - \text{Current Revenue}$$

Revenue Deficiency =

$$RR(\text{ratemaking}) - \text{Current Revenue}$$

*Therefore,*

$$RR(\text{ratemaking}) = \\ \text{Current Revenue} + \text{Revenue Deficiency}$$



# REVENUE REQUIREMENT FORMULA

$$\text{Revenue Requirements} = r(\text{RB}) + E + D + T$$

r = overall rate of return

RB = rate base

E = operating expense

D = depreciation and amortization

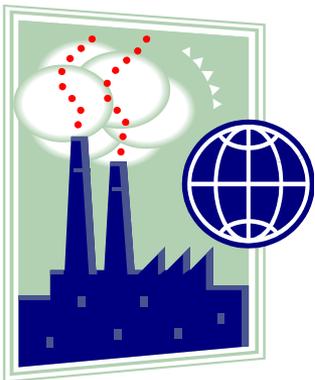
T = taxes



# RATE BASE

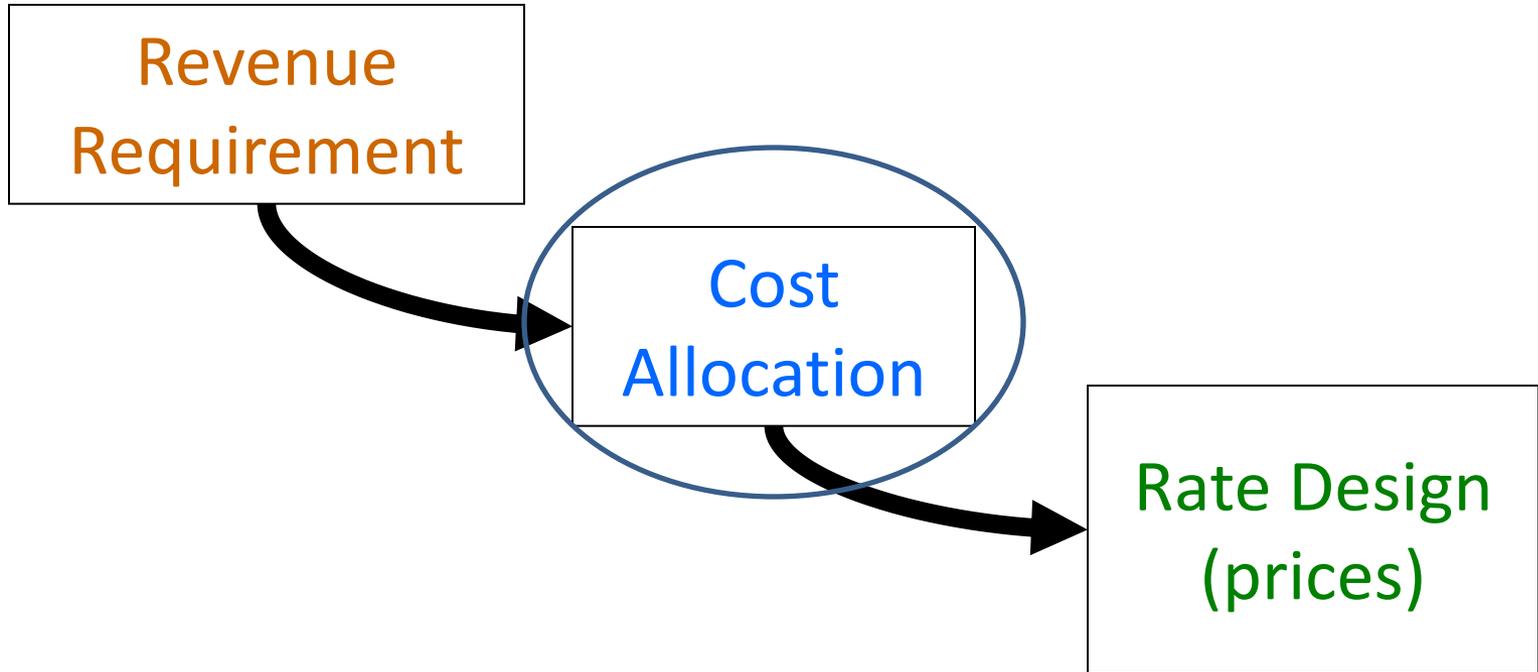
Rate base = net plant + working capital

(from the balance sheet)



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# The Traditional Ratemaking Process



# Cost Allocation

- A class cost of service study is a study in which the total company cost of service (revenue requirement) is spread or allocated to customer classes.
- Customer Class or Class of Service – A set of customers with similar characteristics who have been grouped for the purpose of setting an applicable rate for electric service
  - Common classifications include residential, commercial, primary service and industrial
- The allocation of the total company cost of service to the individual customer classes can provide a revenue requirement target for each customer class, so that each class of customers pays the costs that the utility incurs to serve that class.

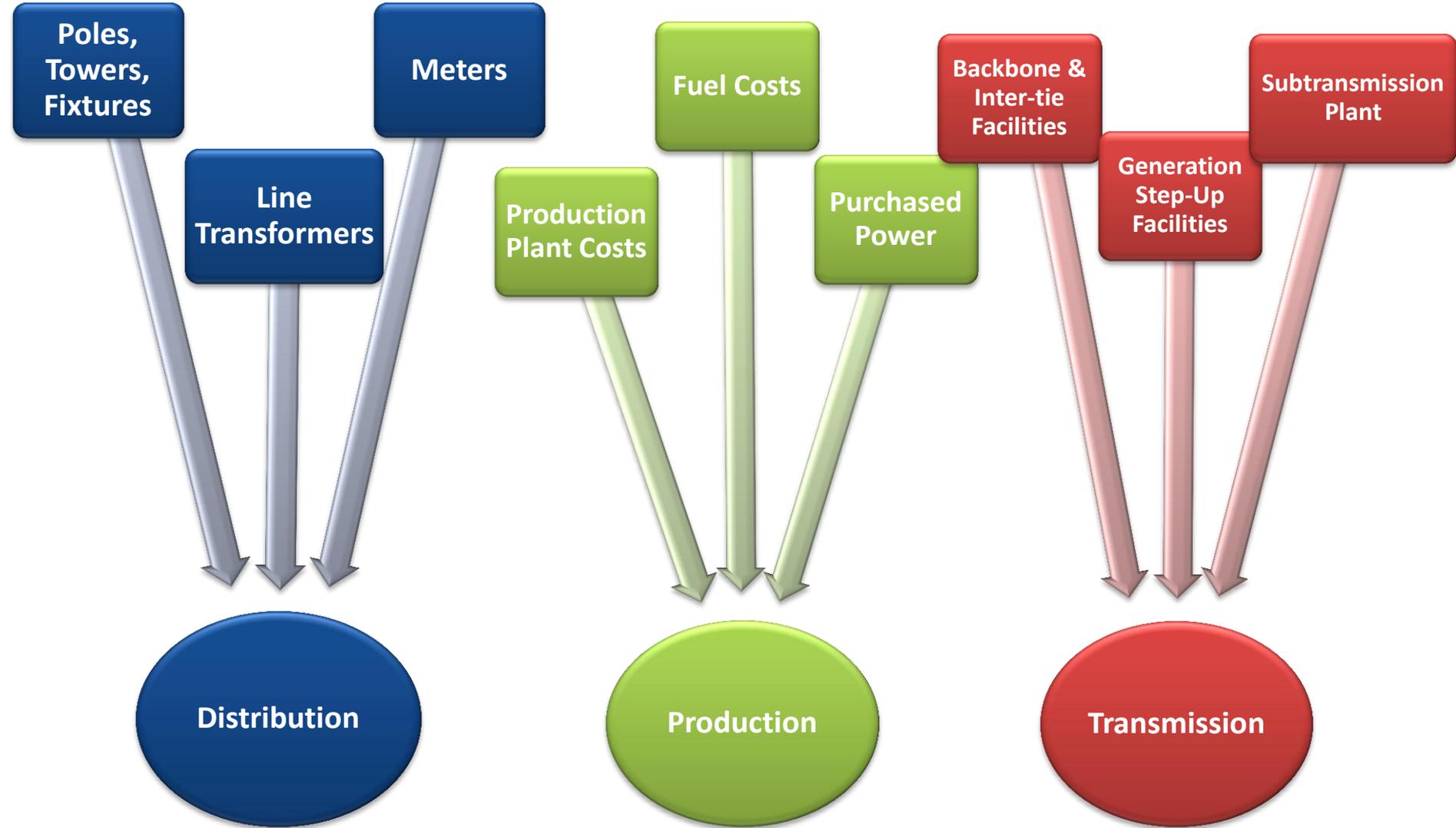


# Cost of Service Study Steps

- Functionalization: costs broken down into production, transmission, distribution
- Classification: costs classified by customer, energy, demand
- Allocation: costs allocated to different customer classes – residential, commercial, industrial



# Cost Functionalization



# Functionalization to Classification

## Distribution

- Poles, towers, fixtures
- Line transformers
- Meters
- Station Equipment



Demand & Customer

- Line transformers
- Poles, towers, fixtures

Demand

- Station Equipment

Customer

- Meters

## Production

- Production Plant
- Fuel costs
- Purchased Power



Demand & Energy

- Purchased Power
- Production Plant

Demand

- Production Plant

Energy

- Fuel costs

## Transmission

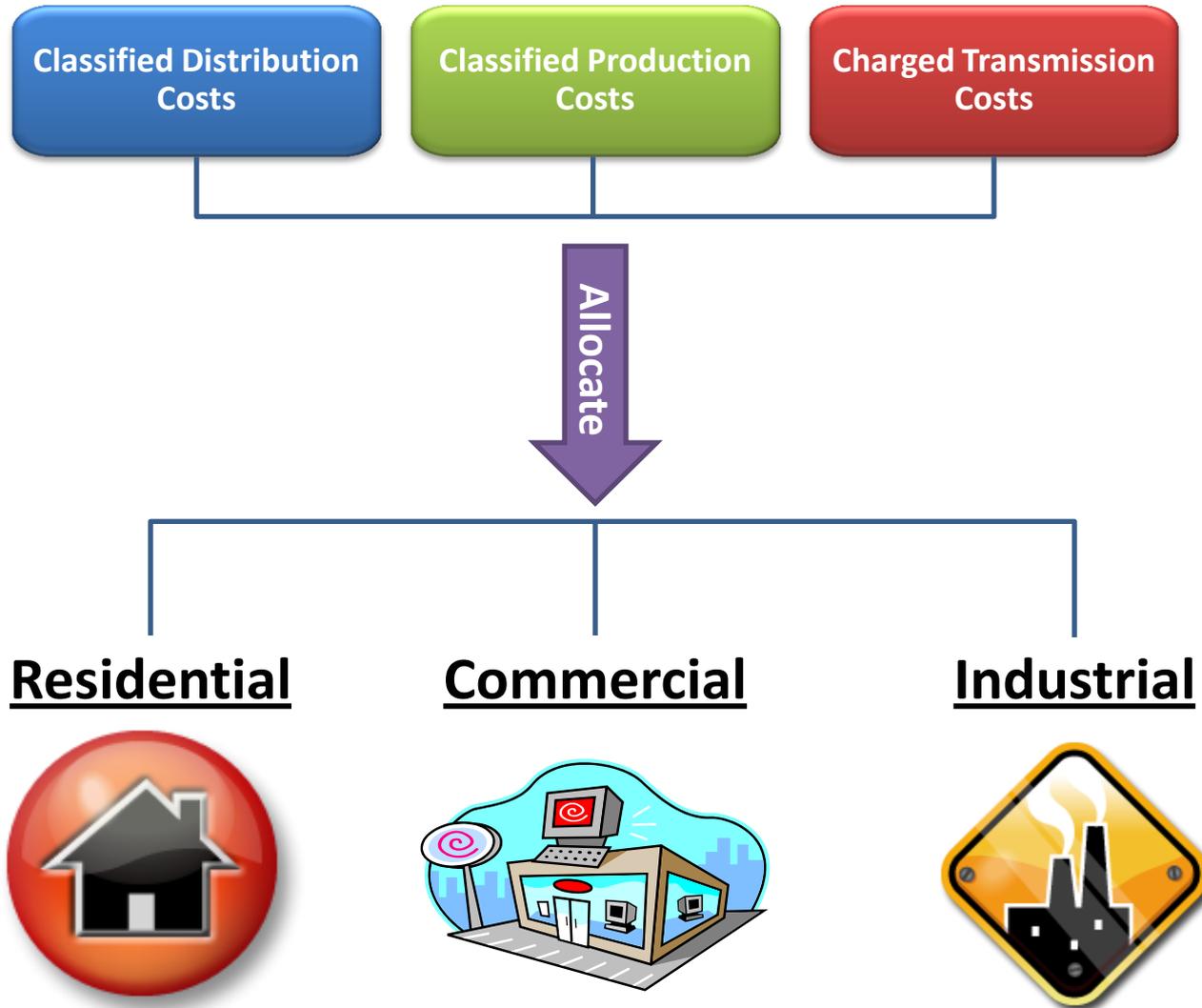
- Backbone & Inter-tie Facilities
- Generation Step-up Facilities
- Subtransmission Plant



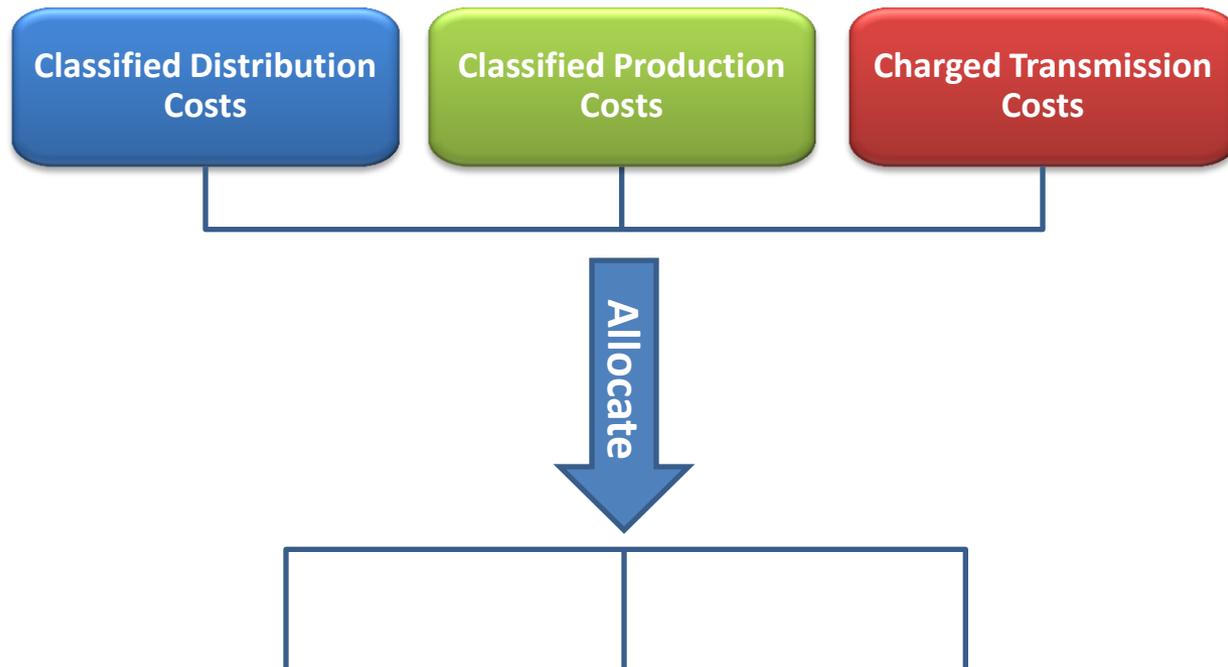
## Demand & Energy

- Transmission costs are charged to utilities based on MISO schedules, some of which are based on demand, some on energy.

# Classification to Allocation

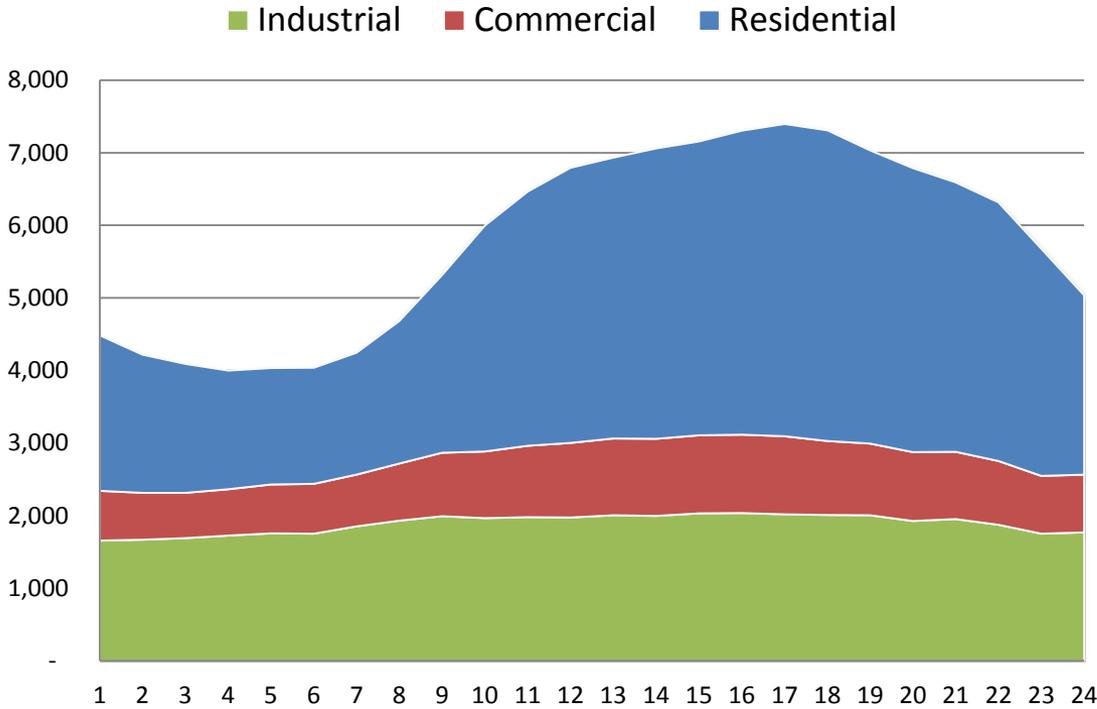


# Cost Allocation



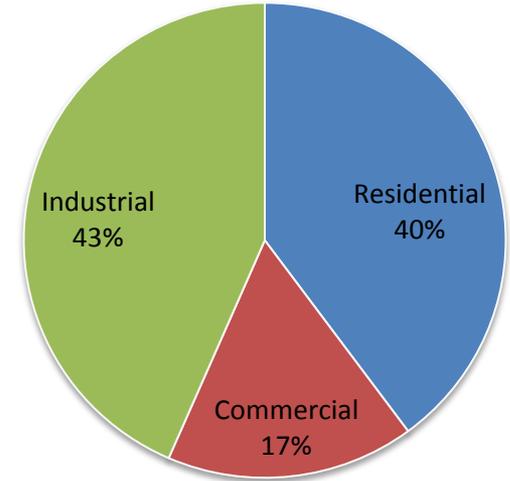
Function	Allocation Factor	Residential	Commercial	Industrial
Production	Demand & Energy	% Production Plant + Purchase	%	%
	Energy	% Fuel Purchase	%	%
Transmission	Demand & Energy	% Transmission	%	%
Distribution	Demand	% Wires	%	%
	Customer	% Meters	%	%

## Contribution to Peak by Class (MW)

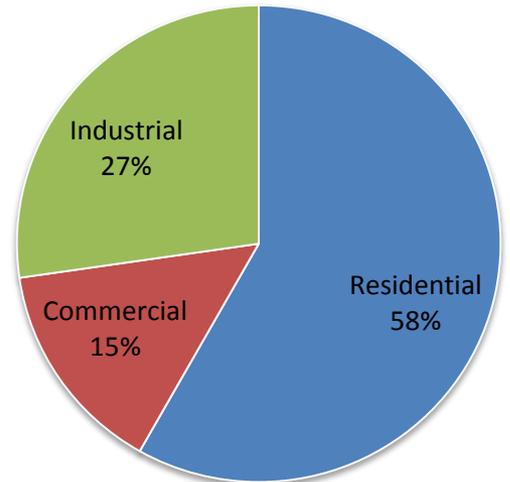


Consumers Energy Load Data from July 5<sup>th</sup>, 2010

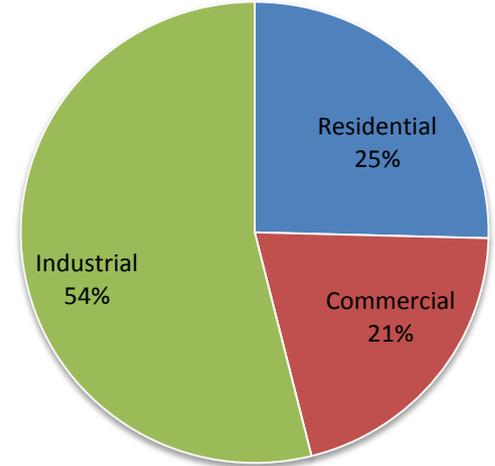
## 5am Total Load by Class



## 5pm Total Load by Class

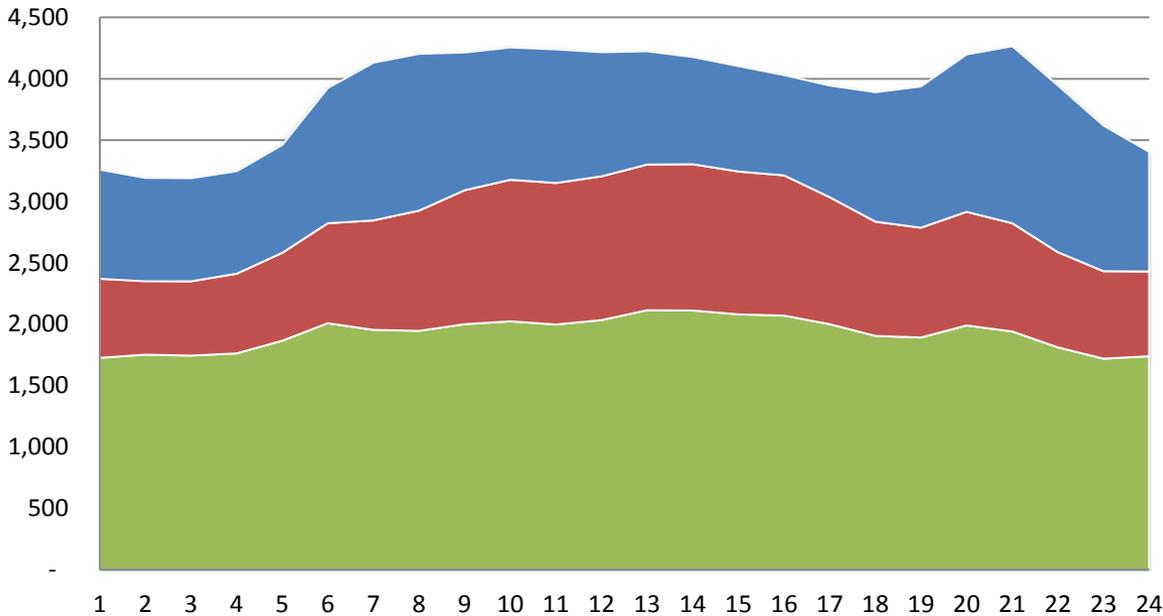


## 5am Total Load by Class

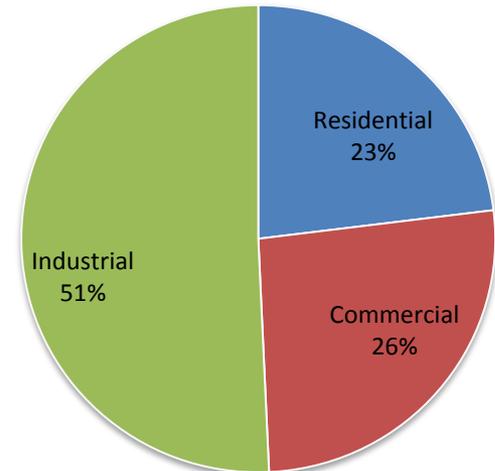


## Contribution to Peak by Class (MW)

Industrial Commercial Residential



## 5pm Total Load by Class



Consumers Energy Load Data from April 14<sup>th</sup>, 2010



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# Consumers Energy Case No. U-17087 Example

**Total Revenue Requirement: \$4 Billion**

**Cost Allocation Across 3 Rate Classes**



**Residential**

**43.6%**



**Commercial**

**25.6%**



**Industrial**

**30.8%**



**Class Requirement:**

**\$1.8 Billion**

**Class Requirement:**

**\$1 Billion**

**Class Requirement:**

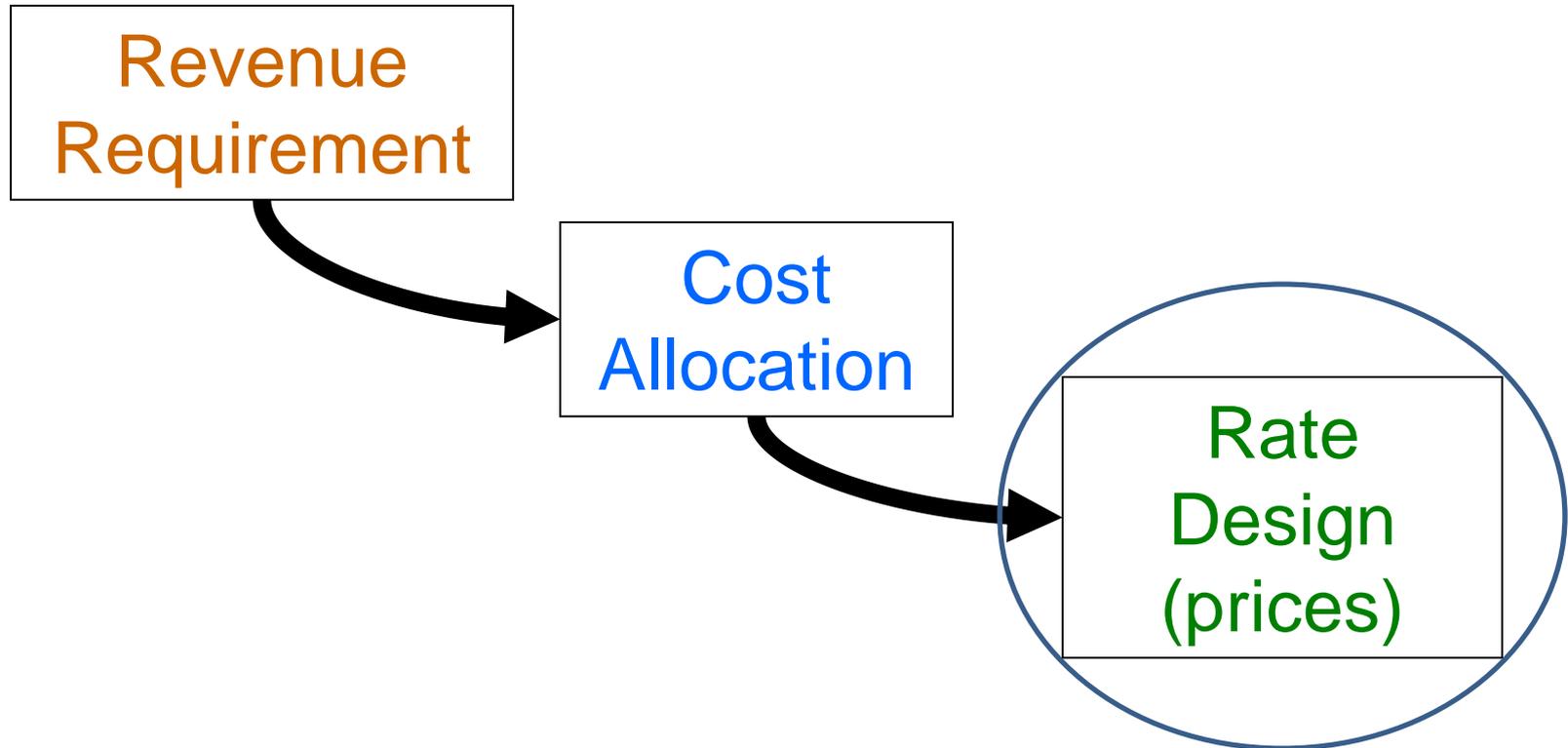
**\$1.2 Billion**

# PA 286 of 2008

- Sec. 11(1) requires MPSC to move to cost-of-service rates (“de-skewing”)
  - By Oct. 6, 2013 for DTE and Consumers (deadline met)
  - Electric rates for other companies moved toward cost of service
- Limits ability to approve special contracts or rates
- Unique to Michigan



# The Traditional Ratemaking Process



# Ratemaking Process

- Cost allocation determines *how many dollars to collect* from various classes or services
- Rate design determines *how to collect dollars* from various customer groups and services
- In principle, costs should be recovered through charges matching their classification and functionalization
  - fixed costs, however, are often recovered through usage charges (particularly for residential and other small customers)



# Pricing Attributes

Dr. James C. Bonbright in his book “Principles of Public Utility Rates” (1961), which is often quoted by rate design witnesses, provides a list of eight traditional rate-making or pricing attributes:

- Simplicity and public acceptability
- Freedom from controversy
- Revenue sufficiency
- Revenue stability
- Stability of rates
- Fairness in apportionment of total costs
- Avoidance of undue rate discrimination
- Encouragement of efficiency



# Determining How Costs Will be Recovered From Customers Within Each Customer Class

- Customer Charge
  - Covers basic fixed cost of serving a customer (e.g., cost of customer hook-up)
    - Meter reading, billing, etc.
    - Charge for basic facilities used to provide service
- Capacity or Demand Charge
  - Covers cost imposed on the system by the user's maximum load or usage
  - Usually excluded for residential service
- Usage Charge
  - Covers incremental cost of each unit of service



# Rate Design

- Michigan employs a three step structure:
  - Power Supply Charges :
    - Charge for on each unit of sale (kWh or MWh).
    - Charge for each unit of demand (KW or MW) for larger commercial and industrial customers
  - Delivery Charges:
    - Customer Charge – Fixed monthly charge.
    - Distribution Charge – per kWh Energy (and Demand for some Commercial & all Industrial rates) charge on each unit of sale.
  - Surcharges:
    - Power Supply Cost Recovery
    - Reconciliation for self-implemented rates
    - Funding for low income assistance, Renewable Energy, and Energy Efficiency programs



# DTE Residential Rate Example

## Residential (D1)

650 kWh

### Distribution Charges

Service Charge	\$6.00	\$6.00
Delivery Distribution Charge	\$0.0500300	32.52
<i>Surcharges</i>		
VHWF	-\$1.59	-\$1.59
LIEAF Surcharge	\$0.99	\$0.99
EOS	\$0.0027330	1.78
RRA	\$0.0032080	2.09
NDS	\$0.0007780	0.51
SBC	\$0.0045600	2.96
SBTC	\$0.0030200	1.96

### Power Supply Charges

<i>Energy Charge</i>		
1st 510 (17kwh*30Days)	\$0.0691200	35.25
Excess	\$0.0825700	11.56
<i>Surcharges</i>		
REPS	\$0.43	\$0.43
PSCR	\$0.0010000	0.65
<b>Bill</b>		<b>\$95.10</b>
<b>\$/kWh</b>		<b>\$0.1463</b>



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# DTE Commercial Rate Example

## Small Commercial (D3)

5 kW Demand  
1,000 kWh

### Distribution Charges

Service Charge	\$8.78	\$8.78
Delivery Distribution Charge	\$0.0355500	35.55
<i>Surcharges</i>		
VHWF	-\$1.35	(\$1.35)
LIEAF Surcharge	\$0.99	\$0.99
EOS ( 581-1650 kwh)	\$4.41	4.41
RRA	-\$0.0040180	(4.02)
NDS	\$0.0007780	0.78
SBC	\$0.0045600	4.56
SBTC	\$0.0030200	3.02

### Power Supply Charges

Energy Charge	\$0.0759500	75.95
<i>Surcharges</i>		
REPS (Comm. 851 - 1650 kWh)	\$1.83	\$1.83
PSCR	\$0.0010000	1.00
<b>Bill</b>		<b>\$131.50</b>
<b>\$/kWh</b>		<b>\$0.1315</b>



# DTE Industrial Rate Example

Industrial (D6 @ Primary Voltage)

1,000kW Demand

432,000 kWh

**Distribution Charges**

Service Charge	\$275.00	\$275.00
Max Demand Charge	\$2.35	2,350.00
Distribution Delivery Chg	\$0.0034000	1,468.80
<i>Surcharges</i>		
VHWF	-\$1.30	(\$1.30)
LIEAF Surcharge	\$0.99	\$0.99
EOS 11,500+ kWh	\$502.43	502.43
RRA	-\$0.0030640	(1,323.65)
NDS	0.00077800	336.10
SBC	\$0.0045600	1,969.92
SBTC	\$0.0030200	1,304.64

**Power Supply Charges**

Billing Demand Charge	\$14.34	13,264.50	<b>92.5%</b> On-Peak Demand
On-Peak	\$0.0440800	5,331.92	<b>28.0%</b> On-Peak Energy
Off-Peak	\$0.0410800	12,777.52	<b>72.0%</b> Off-Peak Energy
<i>Surcharges</i>			
REPS (Prim. >41,500)	\$26.68	\$26.68	
PSCR	\$0.0010000	432.00	

<b>Bill</b>	<b>\$38,715.55</b>
<b>\$/kWh</b>	<b>\$0.0896</b>



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# A Charge by Any Other Name...

Utility	Monthly Charge
Alpena Power	Customer Charge
Cloverland Electric Coop	Facility Charge
DTE Electric	Service Charge
Consumers Energy	System Access Charge
I&M	Service Charge
Midwest Energy Coop	Monthly Availability Charge
Northern States Power (Xcel)	Customer Charge
Thumb Electric Coop	Basic Service Charge
UPPCo	Service Charge
WPSC	Customer Charge
WePCo	Facilities Charge

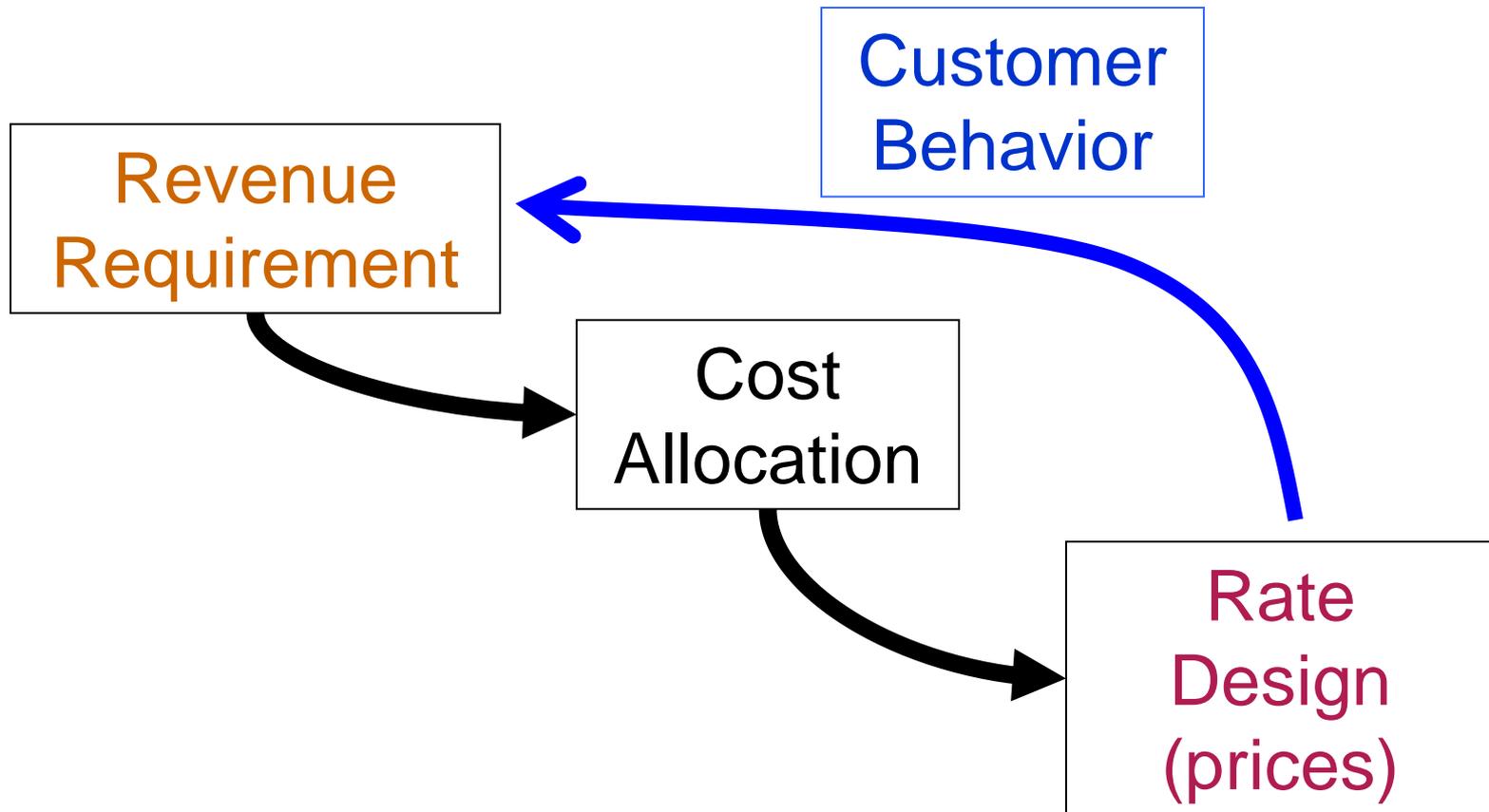


# A Point to Consider

- Utility rates are prices
- People respond to prices
  - Prices provide incentives and signals to producers and consumers
- Rate design will affect behavior
  - Expect a different response to a high customer charge and low usage charge than to a low customer charge and a high usage charge, even if the two are designed to produce equal revenues in the short run (*Why?*)
    - Rate design affects behavior, which affects future costs



# A Feedback Loop



# Other Ratemaking Processes

- REP, EO, LIEAF, Securitization, etc.
  - Authorized by legislation (PA 295, PA 286, etc.)
  - Used to track specific expenses
  - Pay for specific utility programs
- Generally recovered in per kWh charges
  - Sometimes on a per customer basis for the residential class
- Created, reconciled, and approved outside of rate cases



# Other Ratemaking Processes (Cont.)

- Utility Self-Implemented rates
  - reconciled after approval of final rates
- Special Contracts
  - Individually approved by the Commission
- TIER ratemaking
  - Simple mechanism used for rural co-ops



# Power Supply Cost Recovery (PSCR)

- Recovers costs for purchased power and fuel
- The rate consists of a base and factor.
- The PSCR base is imbedded in the base power supply rates
- The factor can change each month up to the maximum factor and is recovered through a surcharge
- Utility is required to submit a multi-year forecast of customer power supply requirements



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# Principles of Rate Regulation

- Fairness to both the regulated utility (its owners (or stockholders)) and the ratepayers
- Avoidance of unjust or undue discrimination between rate classes or customers
  - Cost causation - the concept of the cost causer pays the costs it imposed on the utility system
  - PA 286 of 2008 requires cost based rates

