The Art of Turning Wholesale Rates into Retail Rates

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Wholesale Rates are Important!

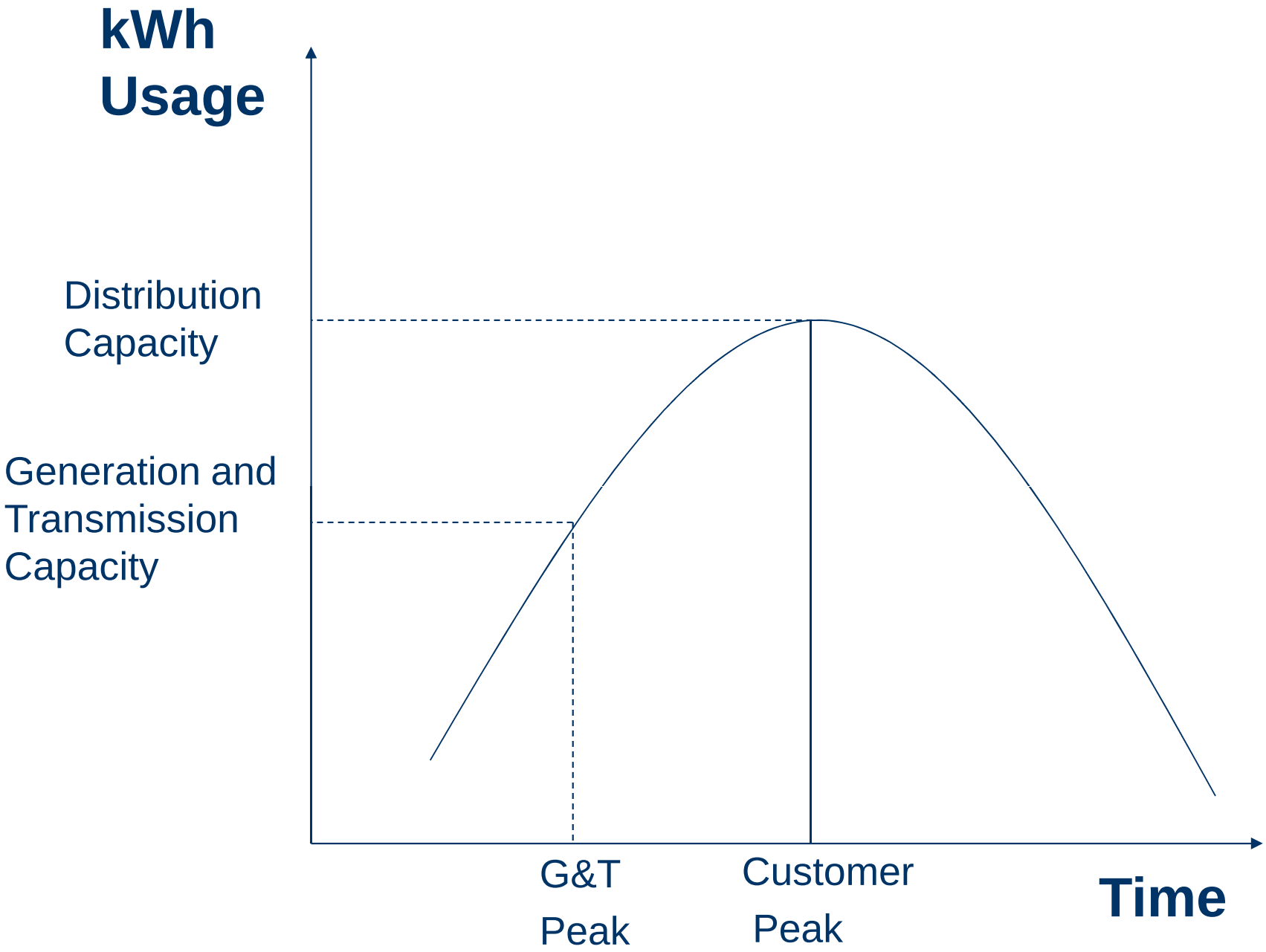
- Represent 60% - 70% of coops costs
- Based on structure, can promote or hinder a coops ability to offer certain types of rates
  - TOU
  - Off-Peak Heating Rates
  - Seasonal Rates
  - High Load Factor Rates

Wholesale Cost

- Capacity
  - Production and Transmission plant
  - Substation
  - Fixed O&M
  - FERC Predominance
- Variable O&M
  - FERC Predominance
  - Fuel

What Drives Production and Transmission Capacity Costs?

- Power requirements during the G&T peak hour
- Anything that is related to serving the peak demand requirements of the G&T
- Does not vary with the amount of energy produced


kWh
Usage
Distribution
Capacity
Generation and
Transmission
Capacity
G&T
Peak
Customer
Peak
Time

What Drives Substation Capacity Costs?

- Individual member maximum demand

What Drives Variable O&M Costs?

- Fuel
- Maintenance of Boiler Plant
- Anything that varies with the amount of energy produced

Wholesale Rate Design Objectives

- Rates should reflect the cost of providing service
  - Equity among customers
- Fixed costs should be billed through fixed charges
- Variable costs should be billed through variable charges
- Purchased power costs should be reflected in rates such that, to the extend practicable, incremental/decremental revenue matches incremental/decremental cost

Wholesale Rate Design Objectives

- Provide rates that better reflect the cost differences of providing power at different points in time
  - CP demand rates
  - Time differentiated demand rates
  - Time differentiated energy rates
- Surety of cost recovery
- Peace in the family
- Load Building

Types of Wholesale Rates

- Coincident Peak Demand
  - Demand charge based on hour with highest system demand
  - Reflects cost causation well because it reflects how the system was planned
  - Flat or time differentiated energy

Types of Wholesale Rates

- Non-Coincident Peak Demand
  - Based on each members highest demand in the month - will be different hours
  - Does not necessarily reflect the cost of providing service because plant additions are not planned based on individual member maximum demands
  - Flat or time differentiated energy

Types of Wholesale Rates

- Average and Excess
  - Average demand charge billed on the basis of average demand for the year – same as billing on energy
  - Excess demand is billed on the monthly difference between actual metered demand and average demand
  - Flat or time differentiated energy

Types of Wholesale Rates

- Seasonal
  - Demand charge can be CP or NCP, but varies by season
  - Flat, time differentiated, or seasonal energy

Types of Wholesale Rates

- Peak Day
  - Demand charge based on the highest 3 to 5 days in the year
  - Flat or time differentiated

Rate Design Steps

- Allocate PP Costs to Rate Classes
  - Costs should be allocated to each class based on how the PP cost is billed or incurred
- Unitize cost according to retail rate design

Coincident Peak Wholesale Rate

- $10 Monthly CP Demand Charge
- $0.04 energy
- System 12 month CP demand 20,000
- System Energy 8,760,000
- Annual demand costs ($10 x 20,000) $200,000
- Annual energy costs ($0.04 x 8,760,000) $350,400
- Grand total annual purchased power cost $550,400

Allocation Units

- Residential energy 6,587,520
- Commercial energy 1,646,880
- Residential CP demand 15,040
- Commercial CP demand 3,760
- Commercial NCP Billing Demand 7,500

Allocation

- Residential energy (6,587,520/ 8,234,400) x $350,400 = $280,320
- Commercial energy (1,646,880/8,234,400) x $350,400 = $70,080
- Residential CP demand (15,040/18,800) x $200,000 = $160,000
- Commercial CP demand (3,760/18,800) x $200,000 = $40,000

Residential Rate Development (CP)

- Customer charge
- Energy Charge
- All purchased power costs go into the energy charge
- Energy portion $280,320/ 6,587,520 = $0.04255
- Demand portion $160,000/6,587,520 = $0.02429
- Total purchased power component in energy rate is ($0.04255 + $0.02429) = $0.06684

Commercial Rate Development (CP)

- Customer charge
- Demand Charge
- Energy Charge
- Energy portion $70,080/ 1,646,880 = $0.04255 per kWh
- Demand portion $40,000/7,500 = $5.33 per kW

Non-Coincident Demand Wholesale Rate

- $8.00 Monthly NCP Demand Charge
- $0.04 energy
- System 12 month NCP demand 25,000
- System Energy 8,760,000
- Annual demand costs ($8.00 x 25,000) $200,000
- Annual energy costs ($0.04 x 8,760,000) $350,400
- Grand total annual purchased power cost $550,400

Allocation Units

- Residential energy 6,587,520
- Commercial energy 1,646,880
- Residential NCP demand 16,000
- Commercial NCP Billing Demand 7,500

Allocation

- Residential energy (6,587,520/ 8,234,400) x $350,400 = $280,320
- Commercial energy (1,646,880/8,234,400) x $350,400 = $70,080
- Residential NCP demand (16,000/23,500) x $200,000 = $136,170
- Commercial NCP demand (7,500/23,500) x $200,000 = $63,830

Residential Rate Development (NCP)

- Customer charge
- Energy Charge
- All purchased power costs go into the energy charge
- Energy portion $280,320/ 6,587,520 = $0.04255
- Demand portion $136,170/6,587,520 = $0.02067
- Total purchased power component in energy rate is ($0.04255 + $0.02067) = $0.06322

Commercial Rate Development (NCP)

- Customer charge
- Demand Charge
- Energy Charge
- Energy portion $70,080/ 1,646,880 = $0.04255 per kWh
- Demand portion $63,830/7,500 = $8.51 per kW

Average and Excess Wholesale Rate

- $9.00 Monthly Average Demand Charge
- $11.50 Monthly Excess Demand Charge
- $0.04 energy
- System 12 month CP demand 20,000
- System Energy 8,760,000
- Annual average demand costs ($9.00 x (8,760,000/8760) x 12)= $108,000
- Annual excess demand costs ($11.50 x 8,000 kW) = $92,000
- Annual energy costs ($0.04 x 8,760,000) $350,400
- Grand total annual purchased power cost $550,400

Allocation Units

- Residential energy 6,587,520
- Commercial energy 1,646,880
- Residential Average Demand (6,587,520/8760x12) = 9,024
- Commercial Average Demand (1,646,880/8760x12) = 2,256
- Residential CP demand 15,040
- Commercial CP Billing Demand 3,760
- Residential Excess Demand (15,040 – 9,024) = 6,016
- Commercial Excess Demand (3,760 – 2,256) = 1,504

Allocation

- Residential energy (6,587,520/ 8,234,400) x $350,400 = $280,320
- Commercial energy (1,646,880/8,234,400) x $350,400 = $70,080
- Residential average demand (6,587,520/ 8,234,400) x $108,000 = $86,400
- Commercial average demand (1,646,880/8,234,400) x $108,000 = $21,600
- Residential Excess Demand (6,016/7,520) x $92,000 = $73,600
- Commercial Excess Demand (1,504/7520) x $92,000 = $18,400

Residential Rate Development (Avg & Exc)

- Customer charge
- Energy Charge
- All purchased power costs go into the energy charge
- Energy portion $280,320/ 6,587,520 = $0.04255
- Average Demand portion $86,400/6,587,520 = $0.01312
- Excess Demand portion $73,600/6,587,520 = $0.01117
- Total purchased power component in energy rate is ($0.04255 + $0.01312 + $0.01117) = $0.06684

Commercial Rate Development (Avg. & Exc)

- Customer charge
- Demand Charge
- Energy Charge
- Energy portion $70,080/ 1,646,880 = $0.04255 per kWh
- Average Demand portion $21,600/ 1,646,880 = $0.01312 per kWh
- Total Energy Charge $0.04255 + $0.01312 = $0.05567
- Excess Demand portion $18,400/7,500 = $2.45 per kW

Seasonal Wholesale Rate

- $13.56 Summer Monthly CP Demand Charge (June – Sept)
- $8.00 Winter Monthly CP Demand Charge (Oct – May)
- $0.04 energy
- Summer CP demands 7,200
- Winter CP demands 12,800
- System Energy 8,760,000
- Annual summer demand costs ($13.56 x 7,200)= $97,600
- Annual winter demand costs ($8.00 x 12,800 kW) = $102,400
- Annual energy costs ($0.04 x 8,760,000) $350,400
- Grand total annual purchased power cost $550,400

Allocation Units

- Residential summer energy 2,371,507
- Residential winter energy 4,216,013
- Commercial summer energy 592,877
- Commercial winter energy 1,054,003
- Residential Summer CP Demand 5,414
- Commercial Summer CP Demand 1,354
- Residential Winter CP Demand 9,626
- Commercial Winter CP Demand 2,406

Allocation

- Residential energy (6,587,520/ 8,234,400) x $350,400 = $280,320
- Commercial energy (1,646,880/8,234,400) x $350,400 = $70,080
- Residential summer demand (5,414/ 6,768) x $97,600 = $78,074
- Commercial summer demand (1,354/6,768) x $97,600 = $19,526
- Residential winter demand (9,626/12,032) x $102,400 = $81,924
- Commercial winter Demand (2,406/12,032) x $102,400 = $20,476

Residential Rate Development (Seasonal)

- Customer charge
- Energy Charge
- All purchased power costs go into the energy charge
- Energy portion $280,320/ 6,587,520 = $0.04255
- Summer Demand portion $78,074/ 2,371,507 = $0.03292
- Winter Demand portion $81,924/ 4,216,013 = $0.01943
- Total summer purchased power component in energy rate is ($0.04255 + $0.03292) = $0.07547
- Total winter purchased power component in energy rate is ($0.04255 + $0.01943) = $0.06198

Commercial Rate Development (Seasonal)

- Customer charge
- Demand Charge
- Energy Charge
- Energy portion $70,080/ 1,646,880 = $0.04255 per kWh
- Summer Demand portion $19,526/ 2,700 = $7.23 per kW
- Winter Demand portion $20,476/4,800 = $4.27 per kW

Peak Day Rates

- Demand costs should be allocated on the basis of each classes contribution to the peak day demands
- Retail rate billings based on kWh or monthly demand will bear little resemblance to a customer's contribution to costs during 3 – 5 days per year.
- We usually assign demand costs for these type rates based on class monthly CP demands, but this is by no means perfect
- CP demand retail rates also won't marry up well with peak day rates

Comparison

	Residential	Commercial	
	Energy	Energy	Demand
CP Rate	$0.066840	$0.042550	$5.33
NCP Rate	$0.063220	$0.042550	$8.51
Average & Excess	$0.066840	$0.055670	$2.45