#### What Goes into My Utility Bill? The Fundamentals of Ratemaking

The Second Annual Missouri Energy Law Seminar September 14, 2012

#### DISCLAIMER

- This presentation is not binding on anyone, least of all the Missouri Public Service Commission, any individual Commissioners, or the Staff of the Commission.
- While I have attempted to make this presentation as factual and impartial as possible, I am involved with several cases pending before the Commission, and this presentation is not intended to reflect Staff's position in any particular case, whether or not I am the assigned attorney responsible for a particular issue.
  - My reference to Ameren Missouri bills and tariff sheets is only for purposes of providing a meaningful example, and is not intended to be taken as evidence or argument in any pending or contemplated cases.
  - Staff is a party in cases before the Commission. I am an attorney for Staff and my job is to present Staff's recommendation to the Commission, as well to participate in all phases of litigation to develop, present, and defend that recommendation.

#### Questions -

- Please feel free to ask questions as we work through the material.
  - I may indicate we're about to get a point, but we may need to touch on something we've already addressed.
  - If we start running short on time we may wait to take it up at the end.

#### Gas & Electric Residential Customer

PRES RDG PREV RDG USE READING RAT 50956 49135 1821 Actual 1M 2317 2306 11 Actual RS GS F Fuel Adjustment Charge Energy Efficiency Pgm Charge Infrastructure Replacement Surcharge MO Local Sales Tax Late Pay Charge @ 1.5% Budget Adjustment Prior Balance Amount Due on 08/17 RETURN THIS STUB WITH PAYMENT TO: AMEREN MISSOURI P.O. BOX 66529, ST. LOUIS, MO 63166-6529	200.84	PGA \$0.27818182 per CCF PGA \$0.27818182 per CCF Service at: Customer Address Service from 07/05 to 08/05/12 Days 31 Last Payment07/26/12 \$200.00 Acct. No. Bill Date 08/07/2012 If the prior balance has been paid, pay current amount only. Budget balance ahead \$142.78 after paying this bill
ADDRESS SERVICE REQUESTED	Cust	omer Address
Amt Due\$243.65Due By08/17Delinquent After08/28		

#### Gas & Electric Residential Customer

			2017			
PRES RDG	PREV RDG	USE	READI	NG R	ATE	AMOUNT
50956 4	49135 18	321 A	ctual	1M		200.84
	2306		and the second	RS GS	5 P	26.81
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and the second se	al Sales Ta	And the second second				4.69
	Charge (		70			.35
Prior Bal	Adjustmen	n.				-18.85
	100	0/47			<i>a</i>	23.30
Amount	Due on 0	0/1/			Þ	243.65
1						

PGA \$0.27818182 per CCF

# How did we get here? RR = C + (V – D) R

- Where:
  - RR = Revenue requirement;
  - C = Prudent operating costs;
  - V-D = Rate base less accumulated depreciation;
  - R = Rate of return (weighted average cost of capital).

### How did we get here?

- Gas elements
  - We will walk through bill line items to discuss how those items come out of a cost-of-service calculation and rate design.
  - We will end up with discussion of the elements of cost-of-service.

- Electric elements
  - We will walk through a discussion of a cost-of-service calculation and rate design to discuss how bill line items fall out.
  - We will end up with discussion of bill line items.

#### Gas & Electric Residential Customer

			2017			
PRES RDG	PREV RDG	USE	READI	NG R	ATE	AMOUNT
50956 4	49135 18	321 A	ctual	1M		200.84
	2306		and the second	RS GS	5 P	26.81
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	100	0/47			<i>a</i>	23.30
Amount	Due on 0	0/1/			Þ	243.65

PGA \$0.27818182 per CCF

PRES RDGPREV RDGUSEREADINGRATEAMOUNT2317230611ActualRS GS P26.81

- This line deals with the Gas portion of the bill
- Meter Readings and Usage in 100 cubic feet (CCF)
- Whether the read was "actual," or "estimated"
- Identify the rate schedule under which the customer receives service
- (CCF) x (applicable per CCF rate)
  + (CCF) x (PGA) + customer charge

# What is the applicable Customer charge, per CCF rate, and **PGA** rate?

#### It depends.

#### Rate Structure

- Refers to what elements exist on a particular rate schedule.
- Examples:
  - Per-unit charge
  - Customer charge
  - Demand charge
  - Blocked rate
  - Seasonal differential

#### Rate Design

- Refers to the values of elements of the rate structure on a particular rate schedule.
- Examples:
  - Straight-Fixed-Variable (SFV) customer charges
    Declining/Inclining Block rates
- Also refers to the relation of charges to one another on different rate schedules.
- Also refers to the phase of the case dealing with determining who gets charged what.

#### **Gas Tariff Sheets**

	UNION ELECTRIC COMPANY GAS SERVICE	UNION ELECTRIC COMPANY GAS SERVICE
ing to	MISSOURI SERVICE AREA	Applying to MISSOURI SERVICE AREA JAN 0.9.1998
ction I , Res y not b 1. ] 2. ]	RESIDENTIAL SERVICE RATE as service to all residential customers as defined in .H. of Company's Rules and Regulations. As indicated in Section ale of Service of Company's Rules and Regulations, this service s resold. Monthly Customer and Volumetric Meter Reading Rates. Lustomer Charge \$15.00 per month belivery Charge \$15.00 per month output of 79.520 per Cof All Over 30 Ccf 79.520 per Cof All over 30 Ccf 70.000 per Cof Minimum Monthly Charge. Purchased Gas Adjustment. Applicable to all metered and/or billed	Missouri ESIDENTIAL SERVICE RATE (conPublic Service Comm for a period of not less than one year.     ** 8. Tax Adjustment. Any license, franchise, gross re occupation or similar charge or tax levied by any taxing au on the amounts billed hereunder will be or designated and a a separate item to bills rendered to customers und jurisdiction of the taxing authority.     * 9. Rules and Regulations. Service will be rendered in acc with the Company's Rules and Regulations for Gas Service of with the Missouri Public Service Commission.
4.	Carting of a straight of the provisions of Rider A - Furchased Gas Hdjustment Clause. <u>Yard Light Service</u> . Any customer with an unmetered gas yard light will have 18 Ccf per month of gas added per light to each month's metered Ccf usage, for billing purposes. This unmetered yard light service is one of limited application. No new such unmetered service will be offered after February 18, 1998.	)
	Seasonal Use. This schedule is a continuous service schedule. If service is disconnected at the request of the customer, and chereafter restored at the same location for the same occupant(s) dithin a six (6) month period following the date of the service disconnection, a reconnection charge will become due and payable when service is restored. The charge shall be computed by multiplying the Customer Charge by the number of months and fractions of months that service is disconnected, plus the Acconnection Charge as indicated in Section D. Miscellaneous Charges, Sheet No. 19. Customer shall not be billed the Customer Charge sould of Sesonal Use charge where a successor account for a Customer has been established at the premises during the interim period; however, the Reconnection Charge shall be applicable unless the premises was not subject to disconnection and reconnection during the entire interim period.	FILED
	Payments. Bills will be rendered at monthly intervals, are due and payable within ten (10) days from their date of rendition and seconce delinquent after twenty-one (21) days from their date of rendition. The date of rendition is the date of mailing by the Zompany. Late payment charges shall be determined pursuant to Section VIII.F. of Company's Rules and Regulations. FIED Monome Make	FEB 18 1998 o 7 - 3 MISSOurces Addition. MISSOurce Reissue. Public Service Comm
dicate	Massum Public s Change. Service Commission GR:2010-0363; YG:2011-0374	DATE OF ISSUE January 9, 1998 DATE EFFECTIVE February 18

#### Gas Monthly Customer and Volumetric Meter Reading Rates Section of Tariff

1. Monthly Customer and Volumetric Meter Reading Rates.

Customer Charge\$15.00 per monthDelivery Charge79.52¢ per Ccf0-30 Ccf79.52¢ per CcfAll Over 30 Ccf0.00¢ per Ccf

- 2. Minimum Monthly Charge. The Customer Charge.
- <u>Purchased Gas Adjustment</u>. Applicable to all metered and/or billed Ccf, pursuant to the provisions of Rider A -Purchased Gas Adjustment Clause.

PRES RDGPREV RDGUSEREADINGRATEAMOUNT2317230611ActualRS GS P26.81

- \$.7952 x 11 = \$8.75
  - Only 11 CCF were used, so all usage falls in first block at 79.52¢/CCF
- \$.27818182 x 11 = \$3.06
   PGA rate = 27.818182¢/CCF
- Customer charge of \$15.00
- Total Gas Line Value = \$26.81

- In most instances, we don't officially know.
- Staff, the Utility, the Office of Public Counsel, and other interveners can provide Class Cost of Service Studies (CCoS Study).
  - These studies assign and allocate costs among classes, customers, levels of usage, and rate elements.
  - The parties almost never recommend exact implementation of their CCoS Studies.
  - Many cases are resolved by "black box" stipulation.
  - The Commission almost never completely accepts a study, must less exactly implements it.

- Even if the Commission did implement a specific CCoS recommendation, and even if that recommendation was based precisely on a party's CCoS study, and the Commission found with that party precisely on every item contained in that party's direct case, the resulting rate design still would not tie directly back to costs, because costs change constantly.
- A CCoS study is a snapshot that guides expert recommendations that consider other factors, including rate shock and volatility.

- Customer charge:
  - Generally based on the cost of the utility being able to provide you with gas, whether or not you use a molecule
  - Typically includes:
    - Cost of rendering and issuing a bill
    - Cost of having a meter and gas lines available
    - Cost of the utility employing people to provide service
    - Cost of the utility having equipment to provide service

- Delivery charge:
  - Generally based on the costs that change depending on how much gas you use
  - May or may not include:
    - Cost of having gas in storage
    - Cost of employing gas buyers to purchase gas, which may require more skill if you have high usage
  - May be used as a rate shock mitigation strategy, or to facilitate affordable access to utility service.
  - Many gas utilities have a Straight-Fixed Variable (SFV) rate structure. They do not have delivery charges.

#### Where did those dollars come from?

- The delivery charge and customer charge are based on the cost of providing certain services, but how do we know how much it costs to provide those services?
- Revenue Requirement =

#### **Revenue Requirement**

- Where:
  - RR = Revenue requirement;
  - C = Prudent operating costs;
  - V-D = Rate base less accumulated depreciation;
  - R = Rate of return (weighted average cost of capital).

- Where's the gas?
- PGA Charge:
  - The actual cost of the gas.
  - Determined in a separate proceeding.
    - The rate is periodically adjusted.
    - The rate is periodically audited.

### What's Missing?

- ISRS (Infrastructure Replacement Surcharge)
  - A charge that certain utilities can collect from customers to cover costs related to replacing inadequate facilities with modern facilities.
- Sales Taxes
- Adjustments for Budget Billing

## Where do rates come from?

• The PSC, through a rate case.

 The PSC's statutory duty is to set "just and reasonable" rates.

- What's a "just and reasonable" rate?
  - It's a rate that is fair to both the utility and to its customers.

## Where do rates come from?

- Just and Reasonable rates are sufficient to cover prudent operating and maintenance expenses,
- Just and Reasonable rates sufficient to allow an opportunity to earn a reasonable return on the value of the capital investment reflected in the assets used to provide utility services. A public utility is generally a private, investor-owned corporation.
  - A public utility is in business to make a profit.
  - The PSC determines the amount of profit the utility will make.

## Where do rates come from?

- The PSC makes just and reasonable rates using traditional cost-of-service ratemaking.
- It is ratemaking based on the utility's cost of providing the service.
- Plus an opportunity for a reasonable profit.

## What's in a rate case?

- The first part of a cost-of-service rate case is simply determining the values to plug into the revenue requirement formula.
- The second part is designing rates that will produce the necessary revenue over the course of a year.

# How does the PSC determine the Cost of Service?

- Rates are determined on an annual basis.
- The basis of this prediction is a year's worth of actual data.
- This is called the "test year."
- Missouri traditionally uses a *historical* test year, that is, historical data.
- Some states use a projected test year.

# How does the PSC determine the Cost of Service?

• COST-OF-SERVICE RATEMAKING:

- Where:
  - RR = Revenue requirement;
  - C = Prudent operating costs;
  - V-D = Rate base less accumulated depreciation;
  - R = Rate of return (weighted average cost of capital).

# COST-OF-SERVICE

- Cost-of-service ratemaking is based upon the test year revenues and expenses as documented in the company's books.
- To facilitate the use of the company's books in ratemaking, utility's are required to keep their books according to the Uniform System of Accounts ("USOA").

# COST-OF-SERVICE

- The USOA is a comprehensive system of accounts including various assets, liabilities, revenues, and expenses under which the financial transactions of a regulated utility are categorized and recorded.
- The use of the USOA greatly facilitates Staff's audit of the utility.

- Revenue requirement cost-of-service components include operating expenses, rate base, capital structure and return on rate base, and depreciation expense.
- Staff's position on the utility's revenue requirement is presented in its Cost-of-Service Revenue Requirement Report and in Staff's Accounting Schedules.

- Test year revenues and expenses are *annualized* and *normalized* to improve their predictive value.
  - Annualization is an adjustment to a test year value to make it more predictive of what the utility will experience going forward.
    - Price-level changes and volume-level changes are annualized.
  - Normalization is an adjustment that removes data outliers and anomalies from the test year data.
    - Unusual events are normalized.

- In public utility accounting, costs and expenses are characterized as either "above the line" or "below the line."
- The "line" is the line drawn under *Total Operating Expenses* on the income and expense statement.
- Only items "above the line" are chargeable to ratepayers.

- Some expenses, although recoverable, are amortized into rates over a period of years.
- An example would be costs associated with a major storm.
- Storm recovery expense from a specific storm is generally amortized over a number of years; for example, in a given case, one-sixth of a particular storm's expense is put into rates.

- Test year expenses and new plant additions are also subjected to a prudence review.
- Expenses or rate base additions will be excluded if they were not incurred prudently, and if harm to rate payers resulted.
- Items will also be excluded if they are not necessary, reasonable, or beneficial to ratepayers.

- Under cost-of-service ratemaking, shareholders are entitled to both a return ON their investment and a return OF their investment.
- The return **ON** their investment is provided by the profit allowed by the PSC.
- The return **OF** their investment is provided by depreciation expense.

- Depreciation expense is a significant part of every rate case.
- It provides a cash flow directly from the ratepayers to the company.
- This cash flow reflects the gradual loss of value of the utility assets as they are used up and worn out in providing service.

- Depreciation expense is accumulated and the total is deducted from the total of rate base to reflect the current value of the utility assets in service.
- "Rate base" is the total gross investment in utility assets at original cost.

- Rate base includes all utility plant-in-service.
- To be included in rate base, an asset must be "used and useful," that is, actually used in the provision of service to the ratepayers.
- Rate base also includes other items such as tools, supplies, fuel stocks, capitalized construction costs, prepaid expenses, and cash working capital.

- "Cash working capital" is the money that the utility needs to operate during the interval between the provision of service and the receipt of payment for the service.
- The necessary amount of cash working capital is generally determined by a Lead-Lag Study.

- Some items are subtracted from rate base
  - Accumulated depreciation
  - Customer deposits
  - Accumulated deferred income tax
  - Disallowed plant
    - Approximately \$90 million of Taum Sauk

- Timing of the completion of major construction is often the driver of a utility rate case.
- The company cannot receive a return on and of its new plant until it is added to rate base in a rate case.
  - By agreement, recently utilities have received "construction accounting" for major plant additions to reduce the financial impact of delay in beginning depreciation expense recovery.

- During construction, capital investments in new plant are tracked as Construction Work in Progress or CWIP.
- CWIP is excluded from rate base because it represents investment in plant that is not yet used and useful.

- Rate base, net of accumulated depreciation and other items, is multiplied by the rate of return to yield the return on the shareholders' investment.
- The rate of return is the **weighted average** cost of capital.
- This is the profit opportunity allowed to the shareholders.

- The Due Process Clause requires that the shareholders be allowed an opportunity to earn a reasonable return on their investment.
- Financial theory holds that a fair rate of return is an amount sufficient to meet the utility's capital costs.
- That is, its weighted average cost of capital.

- On the utility's balance sheet, the value of its assets is matched by the value of its liabilities, including equity.
- The array of debt, preferred equity and common equity on the balance sheet is the utility's capital structure.
- Each type of capital has an associated cost.

- Interest must be paid on debt. That is its cost.
- A specified return must be paid on preferred equity. That is its cost.
- These costs are called "embedded" because they can be readily determined from the terms of the securities.

- The value of common equity is set by the market.
  - The cost of common equity is always a matter for expert financial analysis and testimony.
  - The cost of common equity is often the largest single item by dollar value in a rate case and the most contentious.

- The cost of each component of the capital structure is weighted by a percentage reflecting its proportion of the whole.
  - These weighted values are summed to derive the weighted average cost of capital or rate of return.

- Capital structure:
  - Many utilities are publicly traded.
  - Some are not.
  - Many utilities are owned by holding companies that own other entities.

- The estimation of the cost of common equity is guided by certain decisions of the United States Supreme Court.
  - Federal Power Commission v. Hope Natural Gas Company ("Hope," 1943)
  - Bluefield Water Works & Improvement Company v. Public Service Commission of West Virginia ("Bluefield," 1923).

- Cost of Equity
- Expert financial analysts typically estimate the cost of common equity by applying a number of well-known measures to a group of proxy companies.
- The proxy group is constructed on the basis of **risk.**

- Cost-of-Equity
- Commonly used analytical tools for estimating the cost of common equity are:
  - The Discounted Cash Flow Method (DCM), which can be employed in a number of varieties;
  - The Risk Premium Method; and
  - The Capital Asset Pricing Method (CAPM).
- It is not the particular method used that is important, but the impact of the rate order.

- The second half of a rate case is rate design.
  - Rate design is the process of constructing rates that, when multiplied by the billing determinants, yield the necessary annual revenue.
  - Rate design starts with determining the cost to serve:
    - Specific classes
    - Specific services

- A guiding principle in rate design is to match costs to the cost-causer.
- The first step of rate design is to sort the customers into classes based on usage characteristics.
- Typical classes are residential, large and small commercial, industrial, and government.
  - The Rate Schedules that appear in the Tariff can be, and are, very different from these CCoS classes.

- The residential class consists of thousands of families in houses and apartments.
- Expensive and extensive distribution systems are necessary to link each residence to the utility.
- Residential usage peaks in the morning, the evening, and on weekends.

- The residential class also characteristically uses more electricity in the summer (for running air conditioners) and more natural gas in the winter (for heating).
- The utilities' production and distribution facilities must be sized to meet these demands.

- The large and small commercial classes consist of scores or hundreds of office buildings, malls, stores, churches, hospitals, and businesses of all kinds, large and small.
- These customers tend to use less service on the weekends and overnight.

 The industrial class consists of large volume users, often connected directly to the transmission system, whose usage tends to be steady through the year.

- The responsibility of each customer class for the revenue requirement is determined via a Class Cost of Service Study.
- A Class Cost of Service Study has three steps.
  - Functionalization;
  - Classification; and
  - Allocation.

- Functionalization is the process of categorizing utility assets and operations – and the associated costs and expenses – based on the role each plays in service delivery.
- In electric rate cases, these functional roles are:
  - Generation,
  - Transmission,
  - Distribution,
  - Customer Services, and
  - Administrative and General.

- Classification is the process of subdividing the functionalized costs into sub-categories that further specify cost-causation.
- Sub-categories include:
  - Customer-related costs,
  - Demand-related costs,
  - Commodity costs, and
  - "Other" costs.

- Allocation is the process of distributing the functionalized and classified costs across the various rate classes based on the principle of cost responsibility.
- Allocation is performed using allocation factors, which are ratios that reflect the proportion of total units that may be attributed to each customer class.

- The results of the CCOS study can be controversial because they may show that current rates do not accurately reflect the cost of serving each customer class.
- Class shifts are changes made to the proportional responsibility of each customer class in order to more accurately align costs with cost causers.

- Rate Design experts will often use a CCoS study as a starting point.
- Final rate design recommendations typically consider:
  - A CCoS is a snapshot in time
  - Rate volatility
  - Rate continuity
  - Rate shock

- The final step is designing tariffs that will collect the appropriate revenue from each customer class.
- Typically, electric utility rates include two elements, a fixed customer charge and a variable volumetric charge.
  - Many rate schedules feature demand charges.
  - Many utilities have seasonal rates.
  - Some rate schedules feature blocked rates.

- The customer charge applies regardless of whether or not any amount of service was actually used by the customer during the billing period.
- It reflects some or all of the fixed costs incurred by the utility in serving that customer.

- The volumetric part of the rate varies in accordance with the customer's usage of the utility service.
- Usage is measured by a meter which must be read periodically by the utility.

PRES RDGPREV RDGUSEREADINGRATEAMOUNT50956491351821Actual1M200.84

- This line deals with the Electric portion of the bill.
- Meter Readings and Usage in kilowatt hours (kWh)
- Whether the read was "actual," or "estimated"
- Identify the rate schedule under which the customer receives service
- (kWhs) x (applicable per kWh rate)
  + customer charge

# What is the applicable Customer charge, and per kWh rate?

It depends.

#### What's left?

- Fuel Adjustment Charge
- Energy Efficiency Program Charge
- Taxes

#### Fuel Adjustment Charge

- A Fuel Adjustment Clause requires a utility to pass on increases or decreases in the cost of its fuel and purchased power.
- During an accumulation period, the utility compares the amount it spends on fuel and purchased power to the amount that was included in rates in its last rate case.

#### Fuel Adjustment Charge

- The difference between the amount a utility spent on fuel and purchased power and the amount that was included in rates in its last rate case gets reduced by 5%.
- The remaining 95% of the difference from an accumulation period gets applied to customer bills during a recovery period.

#### Fuel Adjustment Charge

- Fuel and purchased power costs are periodically reviewed for prudence.
- Under- and over-recovery of Fuel Adjustment Clause charges are periodically "trued-up."
- Because a Fuel Adjustment Clause is introduced in a rate case, it is considered part of that utility's rates.
  - It is a variable rate.

#### Energy Efficiency Charge

- Some customers are allowed, by statute, to "opt out" of providing rate support for certain types of energy efficiency charges.
- To facilitate the opt out, and to send price signals to all customers, the energy efficiency costs are a separate line item on regulated utility's bills.

#### Taxes

- The Public Service Commission does not regulate local sales and franchise taxes.
- Utilities are allowed to charge the appropriate tax rate for these taxes on customer bills without coming in for a rate case.

#### Questions?

#### What Goes into My Utility Bill? The Fundamentals of Ratemaking