

*Tariff Development I: The Basic
Ratemaking Process*

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Briefing for the NARUC/INE Partnership

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The Ratemaking Formula and Basic Components

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What is “Cost of Service” Regulation?

In Cost of Service regulation, the regulator determines the Revenue Requirement—i.e., the “cost of service”—that reflects the total amount that must be collected in rates for the utility to recover its costs and earn a reasonable return.

Basic ratemaking formula:

Rate Base
x Allowed Rate of Return
= Required Return
+ Operating Expenses
= Revenue Requirement

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Basic Issues in Rate Proceedings

- Regulated Rates are essentially made up of the following basic components:
 - Recovery of reasonable and necessary expenses
 - Return of investment through rate of return on invested capital
 - Return on investment through recovery of depreciation expense

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Basic COS Component: Operating Expenses

- Allowable Operating Expenses include operation and maintenance costs (O&M), depreciation, and all taxes, including income taxes.
 - Note that interest expense is not included in “Operating Expenses” because it is taken into account in the rate-of-return element of the ratemaking formula

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Basic COS Components: Rate Base and Rate of Return

- The Rate Base is the net amount of investment, funded by investors, in utility plant and other assets devoted to the rendering of utility service upon which a reasonable rate of return may be earned
- The Rate of Return is the percentage rate which the commission finds should be earned on the rate base in order to cover the cost of capital.
 - The rate of return on invested capital is based upon the concept of the cost of capital—i.e., the compensation that investors require for exposing their capital to risk.
 - For a given type of capital, or financing instrument (for example: common equity, preferred stock, long-term debt, etc.), the “cost” to a company when it issues that capital is the rate of return that investors require for similar investments with similar risk characteristics.

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Test-Year Concepts

- Identification of test year
 - Historical test year – generally based on financial data for the most current 12 months for which information is available when rate application is prepared
 - Historical test year adjusted for known and measurable changes to develop test period
 - A signed new labor contract is a known & measurable change, while simply knowing that the contract will change in some way in the future is not.

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Revenue Deficiency Calculation

- After the revenue requirement has been developed, the revenue deficiency can be determined

$$\begin{aligned} & \text{Sales at current rates} \\ \text{Less: } & \text{Projected revenue requirement} \\ = & \text{Revenue excess or deficiency for the test period} \end{aligned}$$

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Revenue Requirement Development

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Public Utility Regulatory Act, Sec. 36.062— Consideration of Certain Expenses

- The regulatory authority may not consider for ratemaking purposes:
 - an expenditure for legislative advocacy (for example, lobbying);
 - funds expended in support of political or religious causes;
 - any expenditure that the regulatory authority finds to be unreasonable, unnecessary, or not in the public interest, such as salary levels, advertising expense, legal expense, civil penalty, fines.

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Operating Expenses

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Operating Revenues and Expenses

- Requirements for inclusion of costs in revenue requirement
 - Costs must be just and reasonable
 - Costs must be prudently incurred
 - Cost adjustments must be known and measurable

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Operations & Maintenance Expense

- O&M expense, as referenced in the FERC USOA, includes:
 - Power production expenses
 - Transmission expenses
 - Distribution expenses
 - Customer accounts expenses
 - Customer service and informational expenses
 - Sales expenses
 - Administrative and general expenses

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Depreciation Expense

- A depreciation study analyzes the mortality characteristics of assets including:
 - Asset productive useful life
 - Salvage value
 - Cost of removal
- Depreciation rates and changes to depreciation rates generally require approval by applicable regulatory commissions with depreciation studies being provided with application for approval of depreciation rates
 - Depreciation studies are generally performed by depreciation consultants and supported with expert testimony in general rate case proceedings
- Depreciation Expense is important because it is a large item and because the Accumulated Depreciation Reserve is a deduction from the rate base

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Depreciation

- FERC definition - Depreciation, as applied to depreciable utility plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service... .Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities.

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Definition of Depreciation Accounting

- AICPA definition - Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible capital assets, less salvage value (if any), over the estimated useful life of the unit (which may be a group of units) in a systematic and rational manner. It is a process of allocation, not valuation.
- ➔ Depreciation expense in the revenue requirement represents the capital recovery of investment used in providing service to customers

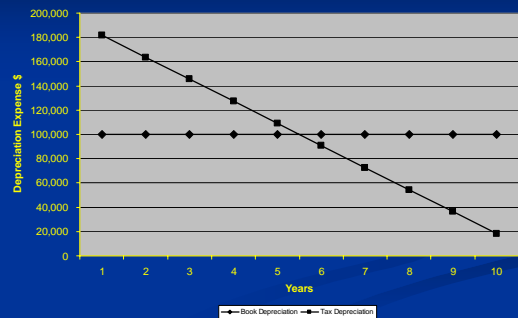
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Federal Income Tax Expense

- Is often a controversial revenue requirement component in general rate case proceeding
 - Tax "normalization" issues—refers to accounting for the differences in timing between book and taxable income.
 - Certain transactions may affect determination of net income for financial statement purposes in one period and the computation of taxable income in a different period
 - Premise of tax normalization is that income taxes recorded for a period should be "matched" to the revenues and expenses recorded for the same period
 - The major difference between book income and taxable income is depreciation expense. Accelerated depreciation is used for income tax purposes while normal depreciation (based on the useful life of the plant) is used to set electricity rates.

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Comparison of Book Depreciation to Tax Depreciation



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Federal Income Tax Expense

- Accumulated Deferred Income Taxes (ADFIT), which reflects the amount of taxes that have been recovered through electricity rates but have not yet paid to the government
 - ADFIT represents a reserve for additional taxes to be paid in the future when the depreciation expense included in rates is less than that used for tax purposes.
 - Because ADFIT represents amounts collected from ratepayers that are not immediately paid to the government by the utility, it is considered to be “cost-free capital.”

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Taxes Other Than Income Taxes Expense

- Non-revenue-related taxes—taxes that are not dependent on or that do not change as a result of the utility’s revenues
 - Payroll taxes
 - Property taxes
 - Franchise taxes (may be based on various elements such as payroll, cost of goods sold, capitalization, etc.)

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Simple Example of Revenue Requirement

REVENUE REQUIREMENT (COST OF SERVICE)

■ Operations and Maintenance expense	\$180
■ Depreciation expense	50
■ Taxes other than income taxes	5
■ Federal Income Taxes	25
■ Return	<u>67</u>
■ Total Revenue Requirement	\$327

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Rate Base

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Rate Base

- Represents the investor-supplied plant facilities and other investments required in supplying utility service to consumers
- Rate Based generally consists of the investment in net utility plant and other items, such as regulatory assets and working capital, devoted to the rendering of utility service and funded by investors upon which a fair return may be earned
- Typically, Rate Base excludes Construction Work in Progress (CWIP), non-utility property, and plant held for future use
- Deductions from rate base are made for investments in net utility plant and other assets funded by others, such as the government

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Criteria for Inclusion of Cost in Rate Base

- “Used and useful” concept – only plant currently providing or capable of providing utility service to customers is included in rate base
- “Prudent investment” concept – only plant prudently purchased or constructed is includable in rate base
 - Construction of nuclear generation plants in 1980s led to state commission prudence reviews of construction management and costs associated with construction of nuclear facilities
 - In some cases, these prudence reviews led to disallowance of plant costs for ratemaking purposes

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Rate Base Components

- Plant in service
 - Largest component of a company's rate base
 - Generally, one of the least controversial aspects of a rate proceeding unless the prudence of construction is an issue or excess capacity is at issue
- Accumulated depreciation
 - Typically not a controversial component of rate base unless depreciation rates or study is an issue in rate proceeding

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Rate Base Components

- Construction Work in Progress (CWIP)
 - Typically not included in rate base unless required to maintain financial integrity of the utility company
 - Allowance for Funds Using Construction (AFUDC) is a non-cash reporting item accrued until such time as CWIP is closed and transferred to Plant in Service account

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Rate Base Components

- Plant Held for Future Use ("PHFU") represents plant facilities that are currently not in service, but that are ready for use in the utility system, or land and land rights owned and held to meet future service requirements
 - Some regulatory commissions do not include PHFU in rate base because it fails the "used and useful" test

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Other Rate Base Components

- Fuel inventories consisting of gas in storage, coal, and nuclear fuel inventories
- Materials and supplies and prepayments—commission rules allow inclusion of a 13-month average balance in rate base
- Cash Working Capital—the average amount of capital provided by investors, over and above the investment in plant and other specific rate base components, to bridge the gap or lag between the time expenditures are required to provide services and the time payment is received for such services

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Regulatory Assets/Liabilities

- Regulatory Assets
 - Regulators can provide reasonable assurance regarding the existence of an asset if:
 - The regulator intends to provide for specific recovery of an incurred cost rather than provide for expected levels of similar future costs
 - Examples of regulatory assets include: unrecovered fuel, rate case expenditures; storm-damage costs
- Regulatory Liabilities
 - Regulators may impose a liability on an enterprise. Examples of reasons for which a liability may be imposed include:
 - Refunds or credits to customers
 - Gains on sales of regulated assets may be deferred and amortized to decrease future rates

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Rate Base Deduction – Accumulated Deferred Federal Income Taxes

- Accumulated Deferred Federal Income Taxes (ADFIT) – represents the deferred federal income taxes resulting from tax normalization and is considered a source of interest-free funds (i.e., cost-free capital) provided by the U.S. Treasury to the utility
 - Because ADFIT balances are considered to be cost-free capital, they are deducted from the return-earning rate base

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Rate Base (Invested Capital) Example

RATE BASE	
■ Plant in Service	1,000
■ Less: Accumulated Depreciation	<u>200</u>
■ Net Plant	800
■ Materials & Supplies	25
■ Fuel Inventories	20
■ Regulatory Assets	5
■ Cash Working Capital	10
■ Accumulated Deferred Federal Income Taxes	<u>(80)</u>
■ Total Rate Base	780
■ Multiplied by Rate of Return	<u>10%</u>
■ Return dollars included in Revenue Requirement	78

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Rate of Return

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Rate of Return

- What is meant by the phrase “allowed rate of return”?
 - In the utility industry, the phrase “allowed rate of return” is generally synonymous with “the cost of capital.” It refers to the rate of return on rate base required to recover the utility’s:
 - Cost of debt
 - Cost of preferred stock
 - Cost of common equity
 - The total dollar amount of return, or earnings, is calculated by multiplying the allowed rate of return by the utility’s total dollar amount of rate base
 - The Allowed Rate of Return can be considered as the rate of return that is permitted, but not guaranteed.

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Rate of Return

- The principles of a fair rate of return were established in two U.S. court cases, one in 1923, and one in 1944.
 - Legal criteria established by the two court cases:
 - A utility’s allowed Rate of Return should be sufficient to maintain the utility’s financial integrity
 - Return should enable utility to attract additional capital on reasonable terms
 - Return should be equal to that earned by other companies with comparable risks

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Rate of Return—Relative Costs of Capital Sources

- Because holders of debt and preferred stock have a senior (higher priority) claim on the assets of a company in comparison to the shareholders of common equity, the costs of debt and preferred stock, reflecting the lower risk of non-recovery by investors, are typically lower than the cost of common equity. (Tax considerations also play a role in the relative costs of capital instruments.)

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Rate of Return—Determining Costs of Each Capital Source

- Whereas the costs of debt and preferred stock are directly observable because they are set by contractual obligations and fixed, the determination of the costs for these two sources of capital is typically not controversial.
- The cost of common equity is not directly observable, however, and therefore must be estimated using financial theory and assumptions about growth and investors’ rate-of-return expectations. Expert witnesses typically provide extensive testimony and analyses on these issues in rate-case proceedings.
 - Because of the subjectivity involved in estimating investor’s required rate of return on common equity, it is often one of the most controversial issues in utility rate cases

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Rate of Return

- Several approaches are predominantly used in estimating the cost of equity
 - Discounted Cash Flow (DCF) method
 - considers certain aspects (such as growth and dividends) of investors' expectations regarding future earnings
 - Capital Asset Pricing Model (CAPM)
 - a well-known theoretical technique that attempts to measure the return expected by investors for a specific stock based on the risk assigned to that stock relative to the overall market
 - Bond yield risk differential method
 - Indicates the cost of equity by comparing the current returns on bonds and stocks and then determining the risk premium associated with a common equity position
 - Comparable earnings (not commonly used in Texas)
 - Estimates the cost of equity by comparing the earned accounting returns (rather than expected market returns) of firms with comparable risk

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Rate of Return

- Regulators aim at setting a utility's rate of return on rate base at a level equal to the "cost of capital" expected by the utility's investors
 - The United States Supreme Court has stated that a public utility return "should be adequate under efficient and economical management"
- ➔ Commission may reduce a utility's rate of return as a penalty for what it considers imprudent management
 - Poor service quality
 - Imprudent construction

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The Weighted-Average (Overall) Rate of Return An Illustration

Example Utility				
Source	Source Amount	Weighting	Source Cost	Weighted Cost
Debt	\$500,000,000	50.00%	8.00%	4.00%
Preferred Stock	\$100,000,000	10.00%	9.00%	0.90%
Common Stock	\$400,000,000	40.00%	10.00%	4.00%
Totals	\$1,000,000,000	100.00%		8.90%

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Cost-of-Service Calculation— Putting It All Together

Entergy Gulf States Docket 16705 (Dollars in millions)				
Item	Test Year Amount	Adjustments	Allowed Level	Percent of Total
Purchased Power	\$246	(\$74)	\$172	11%
Fuel	\$548	(\$129)	\$419	27%
O & M Expense	\$356	(\$36)	\$320	21%
Depreciation	\$263	(\$57)	\$206	13%
Taxes	\$172	(\$13)	\$159	10%
Other items	\$6	\$4	\$10	1%
Return on Rate Base *	\$314	(\$50)	\$267	17%
Totals	\$1,905	(\$355)	\$1,553	100%

* Rate Base	\$2,700
x Rate of Return	9.89%
	\$267

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The Rate of Return on Invested Capital—Additional Points

- The allowed rate of return is set by the regulatory authority in the determination of a utility's cost of service; it is set prospectively and there is no guarantee that the utility will actually earn this rate of return.
- The earned rate of return is measurable only after an accounting period has passed; it is the rate of return that the utility actually earns on its invested capital.
 - The earned rate of return can be affected by interest-rate changes, inflation, changes in accounting principles, changes in consumption, weather, and other factors, and can (will almost certainly) be more or less than the allowed rate of return.

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Cost-of-Service Studies

Cost of Service (COS) Study

- Once a utility's Revenue Requirement is determined, the COS study is an analytical tool that assigns, or allocates, each relevant component of cost on an appropriate basis to determine the relative costs to serve various customer classes with similar end uses and demand
- Objective is to apportion the total utility costs among customer classes in a fair and equitable manner
 - Frequently referred to as cost causation
 - The "cost causer" is the rate payer or customer that receives the service and that causes the cost to be incurred

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Cost of Service (COS) Study

- The Cost of Service Study is a basic issue in rate proceedings
- Each of the cost components of the revenue requirement is allocated to customers using the following basic criteria:
 - Similar customers are grouped in classes
 - Costs are allocated to classes on the basis of how the costs are caused (i.e. driven by demand placed on the system, number of customers, etc).
 - Within each class, rates are then designed to recover the costs. How the rates are designed will affect customer differently based on how they use electricity.

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Why Set Rates to Cost?

- Equity (fairness)
- Sends proper price signals to all customers
- Theoretical surrogate for competitive market forces

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Reasons (Excuses?) For Not Setting Rates to Cost

- Gradualism
- Cost allocations are subject to judgment and imprecision
- Relative risk of classes may vary
- Provide assistance to low income customers

- Subsidies are part of the Business and Regulatory Landscape!

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Cost of Service

Art?

- Requires many assumptions
- Results are highly sensitive
- Subjective

Science?

- Informed judgment
- Reasonable range of outcomes
- Objective

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Questions?

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