GENERAL CONSIDERATION OF RATE BASE REGULATION AND TARIFFS

Four-Step Process

- 1. Determine the Service Provider's Revenue Requirement (RR), Expenses, and Rate Base/Rate of Return.
- 2. Establish the Customer Classes and allocate Total Revenue to them.
- 3. Allocate Revenues, Rates, Price Structure, and Terms of Service for each class.
- 4. Review and Approve Tariffs reflecting Revenue, Classes, and Rates.

• THIS PRESENTATION FOCUSES ON REVENUE DETERMINATION, RATE BASE, AND RATE OF RETURN.

THIS PRESENTATION FOCUSES ON PENNSYLVANIA EXPERIENCE IN REQUIRED REVENUE DETERMINATIONS, EXPENSES, RATE BASE, AND RATE OF RETURN.

RR = E + ROR(RB) Or Revenue Requirement = Expenses + (Rate of Return x Rate Base) *Revenue Requirement* =

Expenses +

(Rate of Return x Rate Base)

The Revenue Requirement must cover a Service Provider's Total Cost of service.

The Revenue Requirement must cover Expenses plus a "fair" Rate of Return (ROI/ROR) on the Rate Base (RB).

Example: A Gas Company

A gas company is publicly owned. The gas utility service provided from the pipeline and fields of the gas company must cover costs with reasonable rates in the country. The gas company may also sell gas to other countries. The gas company may also provide financial support for other public programs such as education, transportation, or economic development.

Whatever costs a gas utility must incur to provide service should be recovered as an expense to the company.

• GAS COMPANY EXPENSES INCLUDE:

- Cost of Gas (Commodity)
- Storage of Gas (Storage Cost)
- Transmission of Gas (Pipeline Cost)
- Distribution of Gas (Service Cost)

- Cost of Gas (Commodity) Includes:
 - Extraction Cost
 - Research and Development Cost
 - Exploration Cost
 - Payments to Suppliers of Gas

- Storage of Gas Cost Includes:
 - Cost to Construct Storage Facilities
 - Loans to Build Storage Facilities
 - Interest Payments on Storage Facilities
 - Operation and Management (O&M) on Storage Facilities

- Transmission of Gas Cost Includes:
 - Payment for Pipeline Operation and Management
 - Payment for Rights of Way (ROW) for Pipeline
 - Replacement of Gas Pipeline
 - Construction of Other Pipelines

• Distribution of Gas Cost Include:

- Utility Costs of Service:

- Above the Line Cost Included
- Below the Line Cost Excluded

TYPICAL ABOVE THE LINE COSTS

- Payments to Affiliates (If Reasonable)
- Operations and Management (O&M)
- Depreciation Expense
- Uncollectible Expense
- Rate Case Expense
- Taxes

Affiliate Payments:

- Payment Included if Reasonable
- Payment Excluded if Excessive or More than Reasonable Market Cost
- Affiliates are corporations associated with Gas Utility

Affiliates Examples

- Gas Commodity Delivery Corporation (Commodity)
- Gas Pipeline Company (Pipeline Operation)
- Gas Transmission Company (Interstate or Intrastate)
- Gas Services Company (Financial, Management or Security Services)

Operations and Management (O&M)

A CRITICAL EXPENSE

WHY?

LARGEST EXPENSE CATEGORY IN PENNSYLVANIA

O&M Components:

- -Labor Expenses
- Labor Benefit Expenses (Medical, Pension, Vacation)
- Costs For Distribution of Gas to Customers
- Customer Service
- Sales Expenses
- Administration and General Office Functions

GENERAL RULE:

O&M Expenses must be Reasonable

O&M Expenses Not Reasonable are Disallowed by Pennsylvania Commission

A "RATE CASE" PROCEEDING CLOSELY EXAMINES THIS LARGEST COST COMPONENT

PARTIES TO THE RATE CASE TYPICALLY DISAGREE VERY STRONGLY ON THE "REASONABLENESS" OF THE EXPENSE • GENERAL RULE WORTH REPEATING:

O&M Expenses must be Reasonable

O&M Expenses Not Reasonable are Disallowed **Depreciation Expense**

- Investors provide the funds to pay for the installation of the facilities and plant.
- Investors have right to:

Reasonable Return on Investment (Margin on Principle Provided to Utility)

AND

• Reasonable Return of Investment over Service Life (Return of Principle Investor Provides to Deliver Service)

• Example

- Gas Utility Borrows \$100 Million
- \$100 Million Pays for Gas Plant Equipment that lasts, typically, 5 years.
- Depreciation Expense: Annual Depreciation Expense:

\$100 Million Over 5 Years\$20 Million per year

- This is "Straight Line" Depreciation
- Pennsylvania uses Straight-Line Depreciation

• CRITICAL DISTINCTION:

Depreciation Expense Versus Depreciation Reserve

Depreciation Expense: Expense Per Year

Depreciation Reserve: Cumulative Years

Depreciation Expense in Price-Regulation:

An Annual Expense Cost

- Depreciation Reserve in Price-Regulation is Cumulative
- Cumulative Figure is *Deducted* from Rate Base Value
- Depreciation Reserve is NOT Part of Rate Base Value
- Consumers have "returned" principle to Investor

- Example: Depreciation Expense vs. Reserve
- Total Cost: \$100 Million For New Pipeline

	Year 1	Year 2	Year 3	Year 4	Year 5
Expense:	\$20M	\$20M	\$20M	\$20M	\$20M
Reserve:	\$20M	\$40M	\$60M	\$80M	\$100M

- Year 5: Annual Depreciation Expense
- Year 5: Depreciation Reserve Removed From Rate Base as "fully recovered" by investors.

Uncollectible Expense

Unpaid Bills of Consumers

Some Consumers Cannot/Will Not Pay

Utility Inability to Collect is Cost

May Include "Social Price" Tariff Cost

Pennsylvania has no "Social Price" Tariff Costs

Philadelphia Gas Works, a municipal gas utility, did have "Senior Citizen" Discount on Price.

Rate Case Expense

Always Controversial

Professional: Accounting, Legal, Engineering Cost

Refers to the Cost of Utility to Present Case to the Pennsylvania Commission

Recovery as a Cost is Always Controversial to Public

Supporters of Recovery Theory:

 Rate Case Expense is a legitimate cost of doing business that must be included for recovery in a Rate Case.

Opponents of Recovery Theory:

Customers must not pay the cost for regulatory proceedings that will increase their rates

Pennsylvania solution:

- Allow only reasonable costs
- Split costs between Utility and Customers (50% 50%)
- Utility recovers as "normalized" cost
- Normalized cost is "average length between rate cases"
- If Utility files no new rate case over the predetermined normalized time, utility gets 50% of cost from customers
Tax Expense

- A very large portion of utility cost
- Taxes are "flowed through" in rates
- Taxes translate into higher prices for consumers
- "Social Cost" contributions may be a form of taxation that also increase price to consumers
- Taxes are always recoverable; Other "social costs" an open issue
- Pennsylvania has no "Social Cost" tariffs or Taxes: Not an issue
- Pennsylvania has "assessments" on utility earnings within state (intrastate) that provides Pennsylvania Commission funding.
- Pennsylvania Commission's "ratemaking" is a quasi-legislative function.
- Is that "Social Pricing" to others?

Taxes include:

Federal income tax: National Tax on Income

State corporate income tax: State Tax on Income

State Capital Stock tax: State Tax on Utility Capital

State Utility Realty Tax: State Tax on Land

State Gross Receipts Tax: State Tax on Utility Monies

- Taxes may be viewed as a replacement for "Social Cost" Obligations
 - Taxes provide "General Revenues" for other "social costs" to society.
 - Utility is not required to provide social costs beyond matters involving utility service.

Some countries impose "Social Cost" contributions "Social Cost" obligations:

A Public Cost Paid by Taxes Or Utility Cost Provided to Society?

Pennsylvania does not impose "social cost" obligations on public utility beyond those related to public utility service. Are "Social Cost" obligations recoverable?

Should there be "Social Cost" obligations?

How should "Social Cost" obligations be treated under Rate Base/Rate of Return regulation?

Social Cost: Treatment

• "Social Cost" obligation examples:

Public utility payments to government for other purposes;

Public utility payments for education, hospitals, transportation, or economic development costs.

Mandatory "social cost" obligations are not "voluntary" charitable donations.

Charitable donations are deductions for public utilities under tax law.

A matter decided by regulators that impose "social cost" obligations.

THE RATE BASE

The Formula:

(RATE of RETURN x RATE BASE)

SECOND COMPONENT OF

RATE BASE/RATE OF RETURN REGULATION

Remember:

Required Revenue = Expenses + (Rate of Return x Rate Base)

WHAT TO INCLUDEIN RATE BASE

AND

WHAT THE RATE OF RETURN SHOULD BE

ARE

IMPORTANT DECISIONS

RATE BASE (IN DETAIL)

AMERICAN LAW:

• U.S. Constitution guarantees "fair return" on the "fair value" of property used for utility service.

Important Questions:

- 1. What is "fair return"
- 2. What is "fair value"

The answer:

A possible function of judgment more than A certain scientific principle.

Two Theories on Valuations

of

"Fair Value"

in Rate Base (Plant in Service) Original Value:

• Dollar Amount spent when plant was put into service.

– Example:

- \$100 Million in Plant Construction in 1990
- \$100 Million Plant in Service Cost for Rate Base and Depreciation for 20 years from 1990 to 2010.

BUT WHAT ABOUT INFLATION?

Reproduction value

• Current Cost to Replace Plant

Example:

- \$100 Million in Plant Construction in 2005
- 10% Inflation in 2006
- \$110 Million Plant in Service Cost for 2007
- \$110 Million for Plant in Service for 2007 Rate Case

WHY?

• Replacement Value theory reflects fact that costs are 10% more in 2007, based on 2006 inflation, than in 2005.

Pennsylvania Solution:

- Pennsylvania Gas & Water Company v. PG&W, 424 A.2d 1213 (1983)
- Original Value Is Acceptable for "fair value" requirement in regulation.

Plant Held for Future Use

Definition:

Not in use but will be used in the future

Pennsylvania does NOT allow

UNLESS

The plant will be "used and useful" in 10 years

BUT

Not a Hard and Fast Rule

Depreciation Reserve

Utility's Original Cost is Reduced By Accumulated Depreciation • Total Cost: \$100 Million Plant Expense

	Year 1	Year 2	Year 3	Year 4	Year 5
Expense	\$20M	\$20M	\$20M	\$20M	\$20M
Reserve	\$20M	\$40M	\$60M	\$80M	\$100M

- Years 1 to 5: \$20M Annual Depreciation Expense Year 5: Depreciation Reserve Removes Cost From Rate Base
- Year 6: The \$100M Cost is not in Rate Base

CONSTRUCTION WORKS IN PROGRESS (CWIP)

- Consumers Not a Good Source for Capital for Improvements
- 33% of American Capital in early 80's devoted to utilities
- Investors expect return on capital invested
- Cost to pay investors is a cost as much as cost to provide plant in service

ADVANCE FOR FUNDS USED DURING CONSTRUCTION (AFUDC)

The difference between CWIP and AFUDC is *Timing*.

There is agreement that the costs (principle and interest) for investment are to be recovered as part of the Rate Base. Timing Issue:

WHEN costs are recovered

- CWIP: Capital costs are recovered from customers concurrent with construction
- AFUDC: Investors finance construction capital costs; consumers pay later

When do consumers pay under AFUDC?

When the investment is "used and useful" in company operations Pennsylvania approach:

- Short Term projects: CWIP and included in Rate Base
- Long Term projects: Put in Rate Base only when completed

Modifications in Pennsylvania

- Pennsylvania restructured electric industry to exclude plant generation from regulation
 - Electric Generation Plants no longer a CWIP v. AFUDC issue.
- Pennsylvania restructured gas industry to exclude commodity (gas) from regulation
 - Gas (Commodity) costs no longer a CWIP v. AFUDC issue
- Customers "shop" for supplier of gas or electricity as commodity.

BUT

- Pennsylvania retains Rate Base regulation for Water utilities
- Electric Transmission and Distribution Still Rate Base/Rate of Return
- Gas Distribution still Rate Base/Rate of Return

Excess Capacity

- Capacity in excess of reasonable amount is disallowed
- Some capacity ("reserve margin") is allowed
- A judgment call.
- Difficult issue arises when "capacity" reasonably built and included in Rate Base for industrial production moves out of state, or overseas, and Rate Base capacity (Plant in Service) is no longer needed.

Cash working capital
Utility needs money to pay for expenses from the time consumers receive their bill until they actually pay their bill.

Utility typically "borrows" capital at interest to cover the "lead/lag" time between the consumers' bill and the consumers' payment of that bill.

Otherwise,

Utility is short of money to pay bills.

SO

The Utility must borrow money

Cash Working Capital (CWC)

reflects that cost

Two Approaches

TO

CWC

• 1/8 Method

• Or

• Detailed "Lead/Lag" Study by Individual Utility

1/8 Method

- 45 Days (Average Time between Service and Payment for Service)
- 45 Days Divided by 365 (Days in year)
- Equals
- 1/8
- 1/8 multiplied by Total Operating and Maintenance Expense

- Materials and Supplies
- Inventory of Needed Supplies for Operations
- Capital to Purchase and Cost to Store are Recoverable
- Added to Rate Base for Recovery under Rate of Return
- Excessive inventory cost is Disallowed.

RATE OF RETURN

The figure represents the "fair return" to investors who invest their money in the utility.

This reflects the fact that "demand" for capital exceeds "supply" so "fair return" must attract investors with capital to the utility's business operation instead of other investment.

Gas Utility Return < Botox Manufacturer Return

10% Return	or	15% Return
Long-Term	or	Short-Term
More Stable	or	More Risk

Which do YOU Prefer as Investor?

Two Major Components:

- Debt: Fixed Cost of Capital
- Equity: Cost of Equity Capital

Debt:

Bond or Debentures

Fixed Rate of Return

Return to Investors is "Interest"

Equity:

Shares of Stock

owned

by Investors (Shareholders) that

Buy Utility Stock Shares

As A

Sound Investment

Reasonable expectations of Both Classes of Investors is Rate of Return

- How is "Reasonable" Rate of Return calculated:
- Debt:
 - Principle
 - Interest over Recovery Period
- Example:
 - \$100 at 10% interest per year for five years
 - Annual Expense is \$110 per year for five years
 - Total expense is \$550 over five years (without compounding interest)

Equity (Shareholder) Return

- Four Options to Calculate:
 - Earnings to Price Ration: Reported earnings and stock price
 - Comparable Earnings: Earnings of similar companies
 - Discount Cash Flow Investors' current and future earnings expectations
 - Capital Asset Pricing Model

Rate of Return

=

Figure Reflecting Debt and Equity Cost



Earnings needed to attract capital

A judgment call.

Conclusion

Rate Base/Rate of Return Regulation in Pennsylvania follows standard model with some deviations.

Rate Base/Rate of Return Regulation is an analytical tool for determining "fair return" on "fair value" while maintaining "just and reasonable" prices under Pennsylvania and federal law.

Rate Base/Rate of Return determinations often involved judgment calls on the utility's Expenses, Rate of Return, and Rate Base.

The allocation of the Revenue Requirement which reflects those decisions is resolved in Rate Design.

Questions??