Overview of Rate Base

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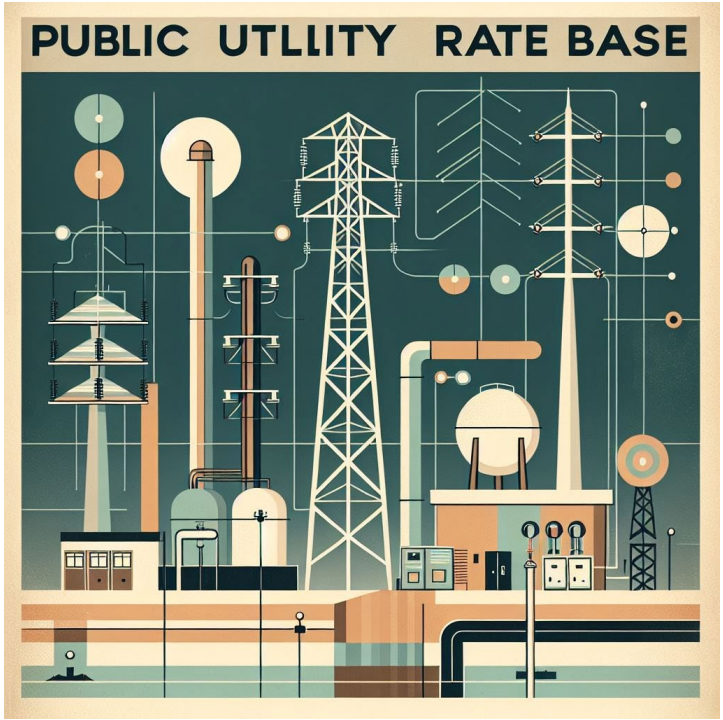
Overview

- What is Rate Base?
- Major Rate Base Components
- Rate Case Implications of Rate Base
- How a Utility Company Treasurer Finances Investments in Rate Base

What is Rate Base?



What Is Rate Base?

FERC's Definition

The Federal Energy Regulatory Commission (FERC) defines "rate base" as the value of property upon which a utility is permitted to earn a specified rate of return, as established by a regulatory authority. This value typically includes the utility's physical assets used in providing services, minus accumulated depreciation.

The Individual States

Generally, individual states will define rate base in a similar manner as FERC; however, each state has unique methods for calculating rate base.

In English

Rate base are those assets a public utility uses to provide services to its customers and are subject to rate regulation.

What Is Rate Base?

U.S. Supreme Court case Smyth v. Ames (1898):

- **Background:** The case involved a challenge to a Nebraska statute that set maximum rates for railroad freight transportation within the state. The railroads argued that the rates were so low that they amounted to confiscation of property without due process, violating the Fourteenth Amendment.
- **Legal Question:** The central issue was whether the state-imposed rates were so low that they deprived the railroads of a fair return on their property, thus constituting an unconstitutional taking.
- **Decision:** The Court held that regulated industries, such as railroads, are entitled to a "fair return" on the value of the property used to provide public services.
- **Opinion:** Justice John M. Harlan, writing for the Court, stated that the rates set by the state must allow the utility to earn a return on the fair value of the property used for public convenience.

- **Definition:** The rate base is the value of the property used by a utility to provide service to the public. It includes physical assets like tracks, stations, and equipment.
- **Valuation Methods:** The Court discussed various methods for valuing the rate base, including original cost, reproduction cost, and prudent investment. The goal was to determine a fair value that would allow the utility to earn a reasonable return.

What is Rate Base?

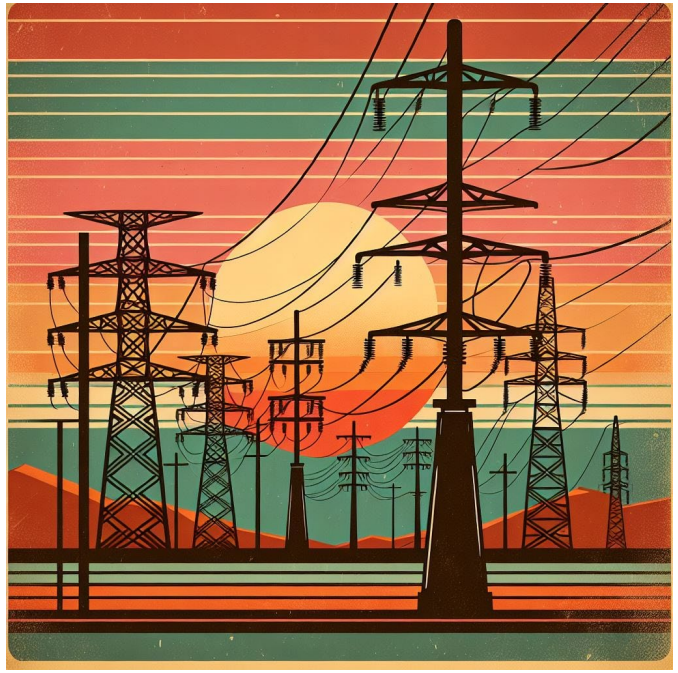
Key Principles Established by Smyth v. Ames (1898)

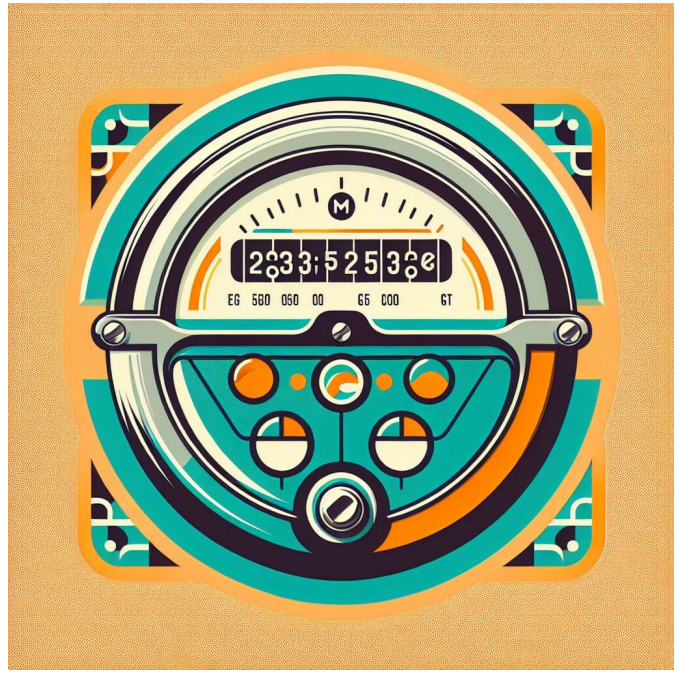
- **Used and Useful:** Only property that is "used and useful" in providing service to the public can be included in the rate base. This ensures that ratepayers are not charged for assets that do not benefit them.
- **Fair Value:** The value of the property should be determined based on its fair value, considering factors like original cost, depreciation, and the cost of reproduction.
- **Fair Return:** Utilities are entitled to earn a fair return on the rate base, which is the value of the property used to provide service. This return should be sufficient to attract capital and maintain the utility's financial integrity.

Impact and Legacy of Smyth v. Ames (1898)

- **Regulatory Framework:** Smyth v. Ames established a framework for determining utility rates that balanced the interests of the utility and the public. It set the precedent that rates must be fair and reasonable, allowing utilities to earn a return on their investments while protecting consumers from excessive charges.
- **Subsequent Developments:** The principles from Smyth v. Ames were later refined and modified by subsequent cases, such as Federal Power Commission v. Hope Natural Gas Co. (1944), which emphasized the overall reasonableness of rates rather than specific valuation methods.

Major Rate Base Components





Major Components of Rate Base

Utility Plant in Service are the physical assets and infrastructure used by a utility company to provide services to its customers.

- **Electric Power Plant:**
  - Facilities where electricity is generated.
  - Examples: Coal-fired power plants, natural gas power plants, nuclear power plants, hydroelectric dams, and solar farms.
- **Transmission Lines:**
  - High-voltage power lines that transport electricity from power plants to substations.
  - Examples: Overhead transmission lines, underground transmission cables.

Used and Useful? Remember Smyth v. Ames (1898)

Major Components of Rate Base

Utility Plant Held for Future Use

Assets that are owned by the utility but not yet in active service. These assets are held for future use when they will be needed to provide utility services.

- A utility company may purchase land for a future substation. Although the substation is not yet built and the land is not currently in use, it is held for future use when the demand for electricity increases.

Major Components of Rate Base

Construction Work in Progress (CWIP): Are the costs incurred for utility plant assets that are under construction but not yet completed and placed into service.

- **Inclusion in Rate Base:** CWIP may be included in the rate base depending on jurisdictional policies, allowing utilities to earn a return on these investments before they are fully operational.

Accounting for CWIP

- **Capitalization:** Costs associated with CWIP are capitalized and recorded as an asset on the utility's balance sheet.
- **Allowance for Funds Used During Construction (AFUDC):** Interest costs incurred during construction are often capitalized as part of CWIP, ensuring that the utility can recover these costs once the asset is placed into service.

Major Components of Rate Base

Examples of Construction Work in Progress

- **New Power Plant Construction:**
  - Costs incurred for building a new power plant, including materials, labor, and engineering services.
- **Transmission Line Expansion:**
  - Expenses related to extending or upgrading transmission lines to improve grid reliability and capacity.
- **Substation Upgrades:**
  - Investments in modernizing substations to enhance performance and accommodate future demand.

Major Components of Rate Base

Acquisition Adjustments are the difference between the purchase price of a utility asset and its original cost when acquired from another utility.

- **Inclusion in Rate Base:** Jurisdictions decide on a case-by-case basis whether to include acquisition adjustments in the rate base.
- **Example:** If a utility purchases a power plant for $10 million, but the original cost was $8 million, the $2 million difference is the acquisition adjustment.

Major Components of Rate Base

Customer Deposits are funds collected from customers as security for utility services, typically to ensure payment of bills.

- **Treatment:** Customer deposits are shown as a liability on the utility's balance sheet and represent a source of non-investor supplied capital.
- **Inclusion in Rate Base:** Customer deposits can reduce the rate base, as they are considered a source of funds that do not require a return. The interest paid on these deposits is usually treated as an operating expense.

Major Components of Rate Base

Prepayments are expenses paid in advance for services or goods to be received in the future.

- **Examples:** Insurance premiums, rent, and maintenance contracts.
- **Inclusion in Rate Base:** Prepayments are included in the rate base as they represent funds that have been expended by the utility but will provide benefits over a future period. These amounts are typically amortized over the period they cover.

Major Components of Rate Base

Contributions-in-Aid of Construction (CIAC) / Customer Advances are payments made by customers to fund plant additions for new or expanded service.

- **CIAC:** Generally non-refundable payments made by customers to cover the cost of extending utility services to their property.
- **Customer Advances:** Payments made by customers that may be refundable under certain conditions, such as meeting specific usage or time criteria.

Major Components of Rate Base

Treatment in Utility Rate Base of CIAC and Customer Advances

- **Reduction of Rate Base:** CIAC and Customer Advances reduce the rate base as they represent non-investor supplied capital.
- **Accounting:** These contributions are recorded as a liability on the utility's balance sheet and are amortized over the life of the related asset.
- **Example:** A developer pays a utility to extend water lines to a new housing development. This payment is recorded as CIAC and reduces the utility's rate base, ensuring that existing customers do not bear the cost of the new infrastructure.

Major Components of Rate Base

Materials and Supplies are the inventory of items used in the operation and maintenance of utility services.

- **Examples:** Spare parts, fuel, chemicals, and other consumables.
- **Inclusion in Rate Base:** Materials and supplies are included in the rate base as they represent necessary items for the ongoing operation and maintenance of utility services. The value of these items is typically based on the average inventory levels over a specified period.

Major Components of Rate Base

Accumulated Deferred Income Taxes (ADIT) arise from differences between the timing of income recognition for tax purposes and for accounting purposes.

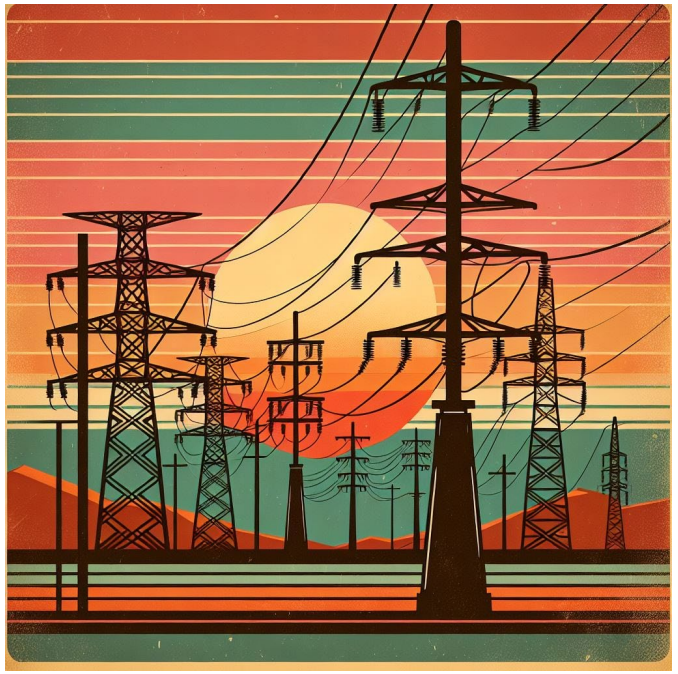
- **Purpose:** ADIT represents the amount of taxes that have been deferred and will be paid in the future. It is a liability on the utility's balance sheet.
- **Reduction of Rate Base:** ADIT is treated as a reduction to the rate base because it represents funds that the utility has collected from customers but has not yet paid to the government.
- **Example:** If a utility uses accelerated depreciation for tax purposes but straight-line depreciation for accounting purposes, the difference in tax expense creates a deferred tax liability. This liability reduces the rate base, ensuring that customers do not pay a return on funds that are not yet due.

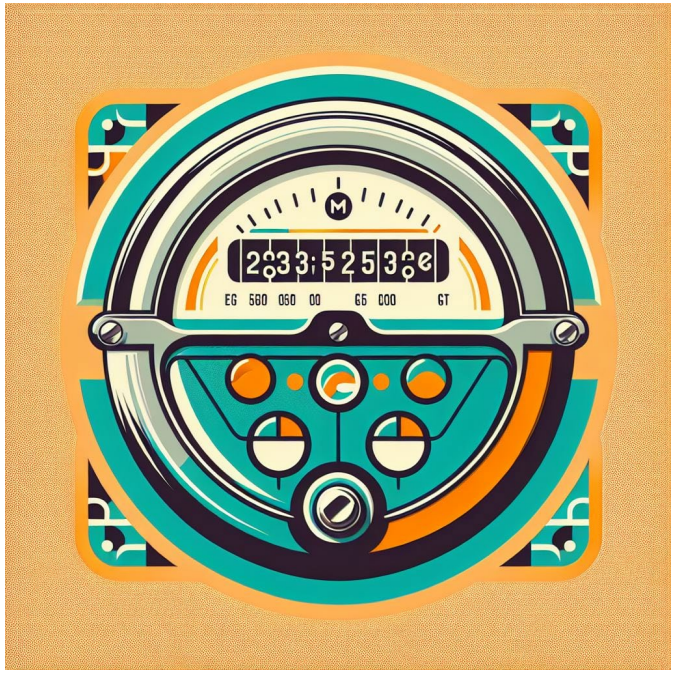
Major Components of Rate Base

Regulatory Assets and Other Deferrals refer to costs that a utility has incurred but has been allowed to defer and recover in future rates.

- **Examples:** Deferred storm recovery costs, deferred environmental compliance costs, and other costs approved by the regulatory commission for future recovery.
- **Inclusion in Rate Base:** Regulatory assets and other deferrals may be included in the rate base as they represent costs that the utility will recover from customers over time.
- **Amortization:** These costs are typically amortized over a specified period, ensuring that the utility can recover the costs while providing transparency to customers.
- **Example:** A utility incurs significant costs for storm recovery and is allowed by the regulatory commission to defer these costs and recover them over a five-year period. These deferred costs are included in the rate base and amortized over the recovery period.

Rate Case Implications of Rate Base.





Rate Case Implications of Rate Base.

Forward-Looking Test Year Rate Base Calculation

Reflects anticipated changes in utility operations and costs.

Advantages:

- Accounts for expected changes in investments.
- Provides a more accurate reflection of future costs.

Challenges:

- Requires accurate forecasting.
- Regulatory scrutiny to ensure reasonableness of projections.

Example

Forward-Looking Test Year: A utility projects increased maintenance costs due to aging infrastructure and includes these in the rate base.

Rate Case Implications of Rate Base.

Historical Test Year with Known and Measurable Changes for Rate Base Calculation

Uses actual costs and revenues from a recently completed 12-month period, adjusted for known and measurable changes to reflects past performance, with adjustments for future changes.

Advantages:

- Based on actual, verifiable data.
- Easier to audit and review.

Challenges:

- May not fully capture future cost changes.
- Adjustments must be clearly defined and justified.

Example

A utility uses last year's costs but adjusts for a construction project going into service in the next year.

Rate Case Implications of Rate Base.

Rate Base Methods in Utility Rate Cases

13-Month Average Rate Base Method This method calculates the average rate base by taking the sum of the rate base at the end of each month over a 13-month period and dividing by 13.

- Smooths out fluctuations in the rate base due to seasonal variations or other factors.

Example*:* If a utility's rate base at the end of each month is $100 million, $105 million, $110 million, etc., the 13-month average would be the sum of these values divided by 13.

End-of-Period Rate Base Method uses the rate base value at the end of the test year or a specific period.

- Reflects the most current investment in utility assets.

Example*:* If the rate base at the end of the test year is $120 million, this value is used for rate-setting purposes

Rate Case Implications of Rate Base.

Public Utility Land In Rate Base

Ratemaking Issues Related to Land

- *Prudent Investment*: Only costs deemed prudent and necessary by regulators are eligible for recovery.
- *Rate Base Inclusion*: Land used for utility operations is typically included in the rate base.
- *Depreciation*: Unlike other assets, land is not depreciated.

The sale of land owned by a public utility at a price higher than its original purchase cost or book value.

- Regulat*ory Approval:* Sales often require approval from regulatory bodies to ensure fairness and transparency
- *Profit Allocation:* Profits from the sale may be shared with ratepayers or reinvested in utility infrastructure
- *Market Conditions*: The sale price can be influenced by current market conditions and demand for the land.

Rate Case Implications of Rate Base.

Lead Lag Studies for Cash Working Capital In Rate Base

A lead lag study measures the time difference between when a utility incurs expenses and when it receives revenue from customers. This study determines the cash working capital required to bridge the gap between expenses and revenue.

- Revenue Lag: Time from providing service to receiving payment.
- Expense Lead: Time from incurring expenses to paying them.
- Sample Calculation: Cash Working Capital (CWC) = (Revenue Lag - Expense Lead) / 365 days.

Example:

If the revenue lag is 45 days and the expense lead is 30 days, the CWC factor is (45 - 30) / 365 = 0.0411. This factor is applied to the annual operating expenses to determine the CWC requirement.

Rate Case Implications of Rate Base.

Balance Sheet Methods Cash Working Capital In Rate Base

The balance sheet method calculates cash working capital based actual financial data to determine cash working capital needs.

Current Assets and Liabilities: Can focus on the difference between current assets and current liabilities.

Entire Balance Sheet: Can use the changes to the entire balance sheet.

Net Working Capital: Cash Working Capital = Current Assets - Current Liabilities.

Historical or Projected: Can be applied to historical actual financial data and forward-looking projections.

Simple Example: If a utility has $15 million in current assets and $10 million in current liabilities, the cash working capital requirement would be $15 million - $10 million = $5 million.

Rate Case Implications of Rate Base.

FERC Method Cash Working Capital In Rate Base

The Federal Energy Regulatory Commission method estimates cash working capital as one-eighth of a utility's annual operating expenses to provide a simplified approach to calculating cash working capital.

- 1/8th Rule: Assumes that one-eighth of annual operating expenses represents the average cash working capital needed. [Think ~45 days]
- Simplicity: Easier to apply compared to detailed lead lag studies.
- Regulatory Acceptance: Many regulatory bodies accept this method for its simplicity and practicality.

Example:

If a utility's annual operating expenses are $80 million, the cash working capital requirement using the FERC method would be $80 million / 8 = $10 million.

Rate Case Implications of Rate Base.

Original Cost Valuation of Public Utility Rate Base

The historical cost of utility assets when they were first put into service to reflect the actual investment made by the utility in its infrastructure.

- Stability: Provides a stable and predictable rate base.
- Regulatory Preference: Widely employed regulators for its simplicity and transparency.
- Depreciation: Includes accumulated depreciation, reducing the rate base over time.

Example:

A utility builds a power plant for $100 million. This amount is recorded as the original cost rate base. Over time, as the plant depreciates, the rate base decreases accordingly.

Rate Case Implications of Rate Base.

Current Market Valuation of Public Utility Rate Base

The current market value of utility assets reflects the present value of the utility's assets, considering market conditions.

- Volatility: Can lead to fluctuations in the rate base due to market changes.
- Fair Value: Aims to provide a fair return based on current asset values.
- Complexity: More complex to calculate and may require frequent revaluation.

Example:

A utility's power plant, originally costing $100 million, is now valued at $150 million in the market. The market valuation rate base would be $150 million, reflecting the current market conditions.

Rate Case Implications of Rate Base.

Allowance for Funds Used During Construction (AFUDC)

A regulatory accounting practice that allows utilities to capitalize the cost of financing construction projects, adding it to the cost of the asset.

- Typical Formula: AFUDC = (Weighted Average Cost of Debt + Weighted Average Cost of Equity) x Construction Work in Progress (CWIP).

Impact on Utility Cash Flow

- Capitalization: AFUDC capitalizes financing costs, reducing immediate expense recognition.
- Future Recovery: Allows for recovery of financing costs through future rates.
- Cash Flow Strain: Increases the utility's capitalized costs, potentially straining cash flow during construction.
- Credit Quality: Can weaken credit quality, leading to higher financing costs.

Rate Case Implications of Rate Base.

Current Return on CWIP

A regulatory approach allowing utilities to earn a return on investments in construction projects before they are completed and placed into service.

- Formula: Current Return on CWIP = CWIP Balance x Allowed Rate of Return.

Impact on Utility Cash Flow

- Immediate Recovery: Utilities can recover financing costs during construction, improving cash flow.
- Reduced Future Rate Increase: Spreads the cost recovery over time, reducing the impact on rates when the project is completed.
- Increased Rates: Customers may face higher rates during the construction period.
- Regulatory Scrutiny: Requires detailed justification and approval from regulators.

How a Utility Company Treasurer Finances Investments in Rate Base.

Funding the Company or Funding the Project?

- As a practical matter, the answer depends in great measure on the orders of magnitude involved.
- One can consider any company as the sum of its individual projects.
- At one extreme, it becomes impractical to manage the capital structure on an asset-by-asset basis.
  - The incremental accuracy gained by funding individual small assets is offset by the loss of a coherent picture of the company as a whole.
  - Optimizing the funding required becomes undermined by the sub-optimal scale of the financings
- At the other extreme, a particularly large investment (say, a utility-scale nuclear plant) might benefit from project-specific funding.
  - The business risk profile may be attractive to a different set of investors than those attracted by the business risk profile of the rest of the company.
  - Ring-fencing might be an attractive alternative, thereby protecting certain investors.

Overview: Short-Term Capital

Instruments	Credit Ratings	Distribution		Investor Type	
		Private	**Public**	**Retail**	**Institutional**
Bank advances		✓			✓
Revolving credit facilities		✓			✓
Sale of accounts receivable		✓		✓	✓
Issue commercial paper	Required	✓	✓	✓	✓

Overview: Medium-Term Capital

Instruments	Credit Ratings	Distribution		Investor Type	
		Private	Public	Retail	Institutional
Bank advances		✓			✓
Note purchase agreements		✓			✓
Revolving credit facilities		✓			✓
Mezzanine loans		✓		✓	✓
Medium-term note programs	Advisable	✓	✓	✓	✓
Bonds *(secured)*	Required	✓	✓	✓	✓
Debentures *(unsecured)*	Required	✓	✓	✓	✓
Leases and quasi-leases		✓			✓
Venture capital financing		✓		✓	✓

Overview: Long-Term Capital

Instruments	Credit Ratings	Distribution		Investor Type	
		Private	Public	Retail	Institutional
Note purchase agreements	Advisable	✓	✓	✓	✓
Bonds *(secured)*	Required	✓	✓	✓	✓
Debentures *(unsecured)*	Required	✓	✓	✓	✓
Mezzanine loans		✓	✓	✓	✓
Leases and quasi-leases		✓			✓
Deeply subordinated debt		✓	✓	✓	✓
Preferred stock		✓	✓	✓	✓
Preference stock		✓	✓	✓	✓
Common stock		✓	✓	✓	✓

Recent Public Utility Holding Company News Items

Reference Materials and Source Information

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Regulatory Reserves Network

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APPENDIX: Life Cycle of Public Utility Rate Base

Life Cycle of Public Utility Rate Base

Step 1: Construction Work in Progress (CWIP)

CWIP represents the costs incurred during the construction of a utility asset, such as a power plant, before it is completed and placed into service with little or no cash flow for financing collected from customers.

- Cash and Short-Term Borrowings: Utilities use a combination of cash reserves and short-term borrowings to finance the construction costs.
  - Cash Reserves: Internal funds set aside for capital projects.
  - Short-Term Borrowings: Commercial paper, loans or credit lines with a short repayment period, typically used to cover immediate construction expenses.

Example:

- Initial Costs: Land acquisition, engineering, and construction work totaling $30 million.
- Cash: $10 million from cash reserves.
- Short-Term Borrowings: $20 million from commercial paper issued and a short-term loan.
- Accumulation in CWIP: These costs are recorded in the CWIP account until the project is completed.

Life Cycle of Public Utility Rate Base

Step Two: Plant Enters Service

- Inclusion in Rate Base: The costs of the plant, including construction and any capitalized financing costs, are included in the rate base in the utility next rate proceeding.
- Depreciation: The plant's value is depreciated and accumulated over its useful life, reducing the rate base over time generating positive cash flow for the utility.
- Rates: The plant is service has its depreciation expense and the cost finance the plant while operating paid for by customers via their utility bills.
- Long-Term Financing: The utility company will likely issue long-term bonds to finance a portion of the new power plant and have the bond's maturity align with the useful life of the new power plant.

Example: A utility completes a new power plant costing $30 million.

- Rate Base Addition: The $30 million is added to the rate base.
- Customer Rates: Rates are adjusted to recover the original cost of the plant (depreciation) and the return on the capital invested (Authorized Cost of Capital) over its useful life, ensuring the utility has an opportunity to earn a fair return on its investment.

Life Cycle of Public Utility Rate Base

Step 3: Ongoing Capital Investment

Utilities must continually invest in their infrastructure to maintain, upgrade, and comply with regulatory requirements over the life of the asset to ensure reliability, efficiency, and compliance with environmental standards.

- Rate Base Increase: The additional capital investment is added to the rate base once construction is completed.
- Customer Rates: Rates are adjusted to recover the new investment the incremental increase in rate base and depreciation expense for the additional capital investment.
- Additional Capital Required: The utility will need to fund the incremental construction costs until added to rate base and then obtain additional longer-term financing once an investment is placed in service and recovered from customers through rates.

Example: Pollution Reduction Assets

A utility has an existing power plant with an original cost of $30 million.

- Additional Investment: The utility invests $5 million in pollution reduction advanced filtration system for the plant.
- Increased Gross Plant Balance: The original cost for the plant increases from $30 million to $35 million.

Life Cycle of Public Utility Rate Base

Step 4: Retirement and Decommissioning

Once the useful life of the asset as been reached and it can no longer provide service to customers the plant is retired.

- Rate Base Reduce: Any unrecovered net book value of the plant is removed from rate base.
- Customer Rates: Customers are no longer paying the costs for the plant in their rates.
- Financing is Repaid: The utility company has repaid most or all of its long-term debt and dividends to its equity owners with the case flow generated from depreciating the asset.
- Decommissioning: Customers should have paid a reasonable estimate for the cost removing the asset via the depreciation rates for the asset.

Example: Pollution Reduction Assets

A utility has an existing power plant with an original cost of $35 million and accumulated depreciation of $37 million

- Cost of Removal: The depreciation rates for this plant collected $2 million more than the original cost of the plant to fund the costs of decommission.
- Removal from Rate Base: The original cost for the plant of $35 million is removed of rate base along with the $35 million of accumulated life depreciation and $2 million is used to pay for removal with $37 accumulated depreciation removed from rate base.

Optimizing the Capital Structure

- Capital is one of the scarce resources required by the utility company.
- Capital is not homogeneous; neither are their sources.
  - Owners assume more risk and consequently require a higher rate of return.
  - Creditors assume less risk and consequently require a lower rate of return.
- The capital required is a blend of different types of capital:
  - A company cannot be financed entirely with debt. The business and financial risks skyrocket when debt represents an increasingly large proportion of the company's funding.
  - A company can be financed entirely with equity. However, the company would incur the opportunity costs of not raising cheaper debt and not taking advantage of the tax deductions associated with interest costs.
  - Therefore, a blend of both debt and equity provides a lower weighted average cost of capital (WACC).