Performance Based Regulation of Philippines Electricity Distribution Companies

REGULATORY TRAINING COURSE

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SESSION 2A – Asset Valuation Principles

We will cover

- Session 2A – Asset Valuation Principles (16)
  - Importance of Asset Valuation
  - Cost-Based & Value-Based Methods
  - Advantages of the ODRC Valuation Method
- Session 2B – Valuing Non-System Fixed Assets
- Session 2C – ODRC Standards for System Fixed Assets (31)
  - Standard Replacement Costs
  - Standard Asset Lives
  - Optimisation Rules
  - Depreciation
- Session 2D – Valuing System Fixed Assets (10)

The Importance of Asset Valuation

Rate Base Definition

- Under ROR regulation, the Rate Base (or Investment Base) is the amount of money a power company has invested over the years in assets that serve the customers, plus the amount of working capital required to keep the company going, less depreciation collected over the years
- Applying the cost of capital (WACC) to this rate base determines the return a utility is typically allowed to earn on its assets – which is the sum of returns earned by debt and equity holders

The Importance of Asset Valuation (2)

Return on Assets

- Where a **return on assets** (ROCA) approach is used, the rate base is the net system fixed assets as determined by a **valuation of the assets** less a suitable allowance for **depreciation** plus an allowance for **working capital**
- This is the approach adopted under the RDWR in the Philippines
- The return **on** assets and the return **of** asset capital (i.e. depreciation) typically amounts to **70%** of the costs embedded in rates – this is the **importance** of an accurate and robust asset valuation

Valuation Methods

- In general, asset valuation methods can be characterised under two main approaches – ***cost based*** and ***value based***
- **Cost based** approach
  - Relates the value of an asset to the cost of purchasing the asset or the service potential embodied in the asset, either at the original cost or the original cost adjusted to reflect its current new replacement value
- **Value based** approach
  - Determines the value of an asset largely from its cash generating capacity
  - Can be measured by the net present value of future cash flows or the cash generated by selling the asset - the economic value

Previous Valuations in Philippines

- Historical Cost
  - Still required for tax purposes
- Reproduction Cost, New
  - A Replacement Cost method
- Sound Value
  - Values appraised up (or down) according to observed condition
  - No longer straight line depreciation
  - No adjustment for inefficient assets
- Fair Market Value
  - Remains suitable for land and buildings

Two Key Differences

- RC - Customers Protected
  - Optimization
- Depreciation Residual - 5% of ORC
  - Discourages early replacement and higher capex

Asset Valuation Under PBR

- Under a Performance-Based Regulation asset valuation is normally cost-based
- Historical Cost
  - Based on the original cost of assets
- Replacement Cost
  - Based on current replacement cost of assets
- ODRC
  - Based on current replacement costs of assets & allowing for network optimisation consistent with PBR

Historical Cost Valuation

- Historical Cost is determined as the total cost incurred when establishing the asset
- Commonly used in ROR regulation as in the Philippines
- Commonly referred to as DHC (Depreciated Historic Cost)
- Inflation adjusted actual cost is a variant of the historical cost approach which attempts to adjust the asset value for inflation - this method is referred to as DAC (Depreciated Actual Cost).
- It is common for a straight-line depreciation method to be employed under both methods

Historical Cost Valuation (2)

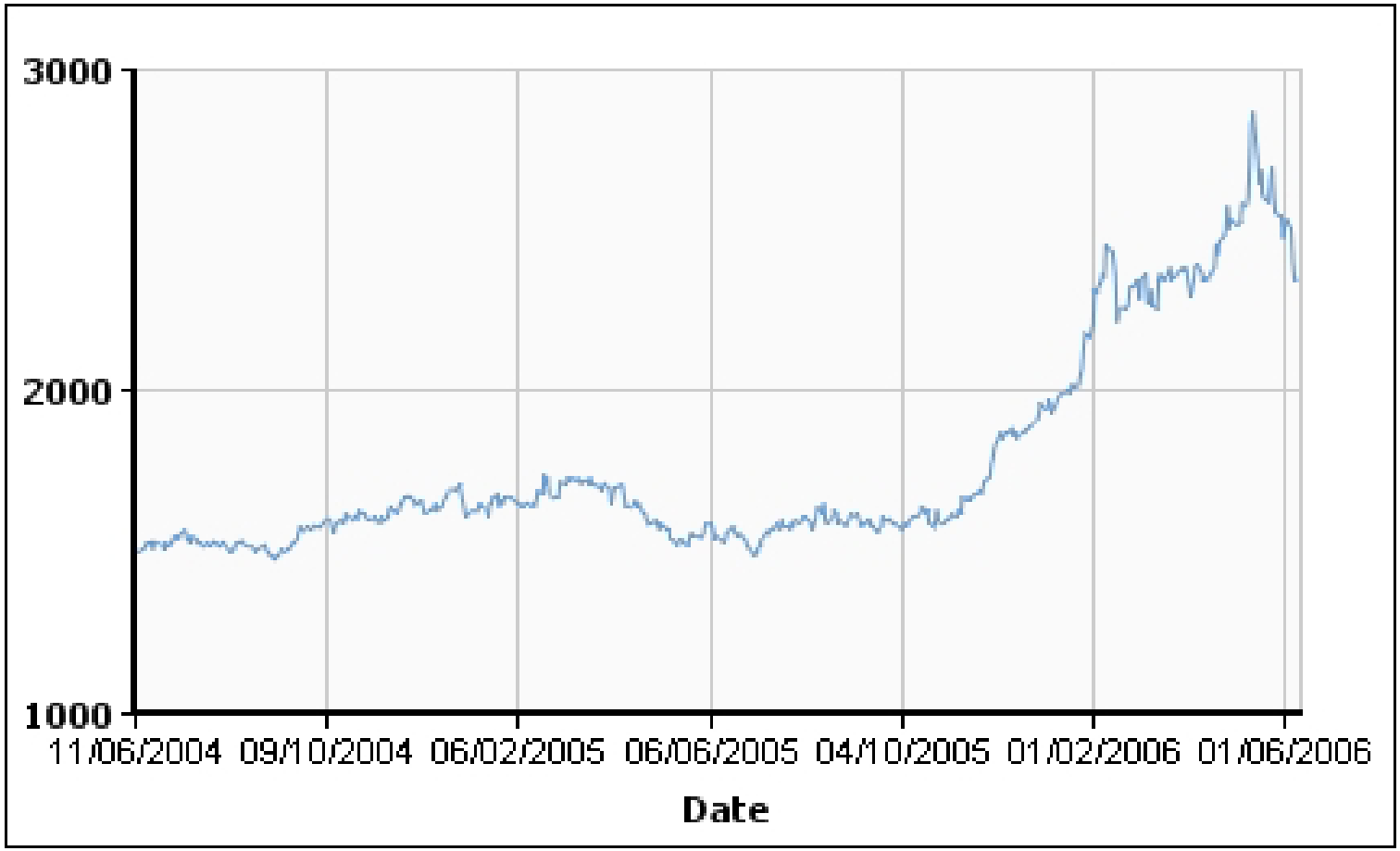
- Disadvantages of HC valuation
  - It understates the values of assets during periods of high inflation
  - It overstates the economic value of assets during periods of significant technological developments
  - Records of purchase prices or acquisition costs are sometimes not available, especially of older assets
  - The impact of “wrong” investment decisions, over-payment for assets or over-investment in assets are carried through for long periods
  - There is no incentive for ensuring asset performance is efficient

Current Cost Valuation

- Current/replacement cost is determined by finding current market prices for assets i.e. the price one would pay in the current period for the asset, or
- Inflation-indexed costs are determined by applying an annual inflation factor
- Current replacement cost may equal the inflation-indexed cost but it is highly likely they will differ
- Regulators develop schedules with standard asset replacement costs
- These schedules include standard life-spans, which allows depreciation on assets to be calculated, based on replacement cost but taking the actual age of an asset into account

Current RC & Inflation-Indexed Cost

Volatility in Metals Prices – outstrips inflation



Current Cost Valuation (2)

- Replacement cost valuation has the following advantages:
  - Matches the economic value when inflation is high;
  - Gives an indication of capital costs to potential market entrants;
  - Allows for technological gains or improved design methods to be captured; and
  - Does not rely on historical acquisition records.

Current Cost Valuation (3)

- Replacement cost valuation has the following disadvantages:
  - Subjective
    - Current prices may be difficult to determine if purchasing is done through contracts
    - Methodology of compensating for technological change
  - There is no incentive for optimising asset design
  - Requires more effort to calculate and requires regular re-calculation
  - The regulator may depend on the utility to determine the replacement/inflation-indexed cost. This figure is not usually audited. The principles applied may have to be tested/reviewed by the auditors.

ODRC Valuation

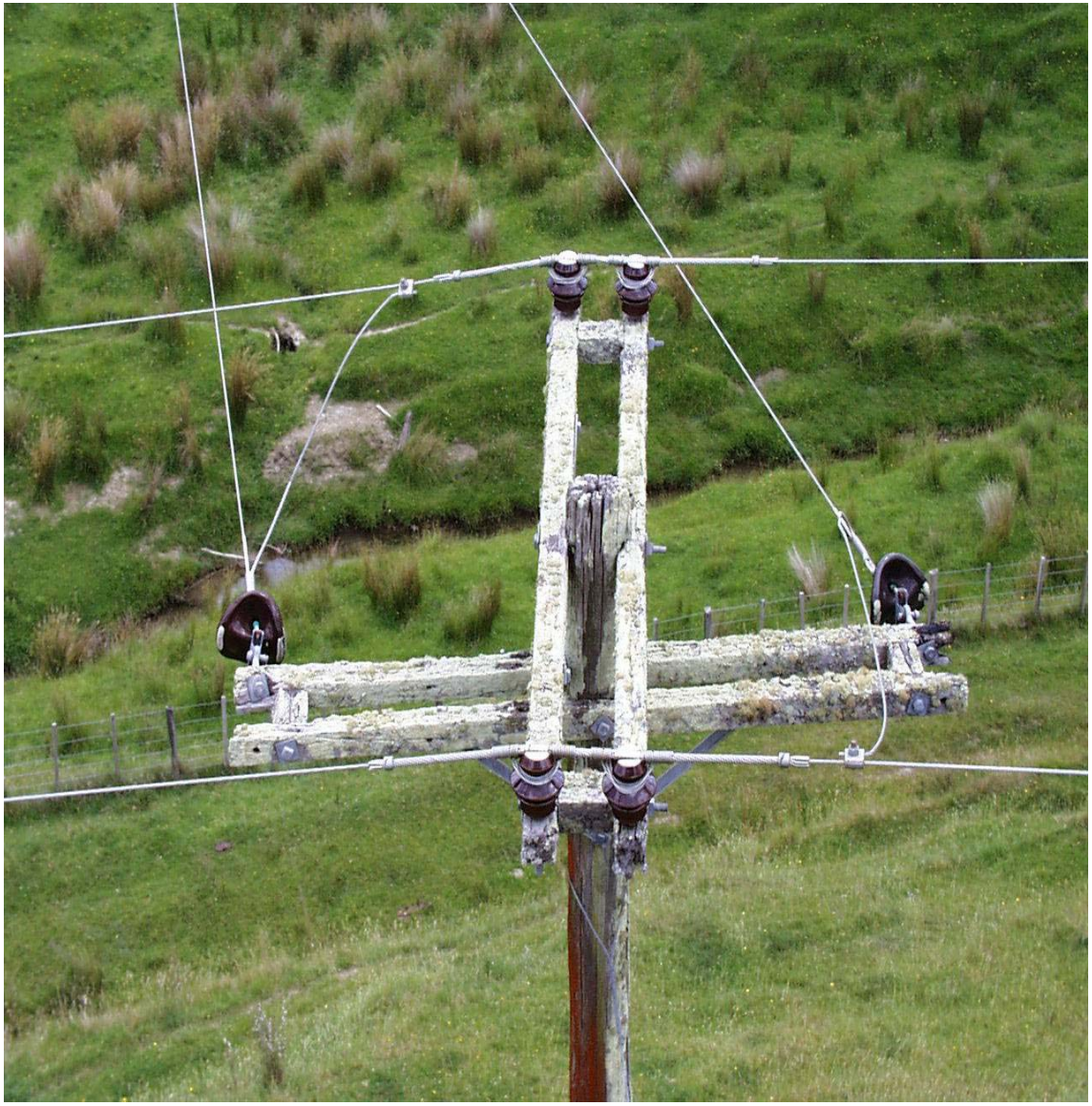
- ODRC/DORC asset valuation methodology is a more complex extension of the replacement cost methodology and is determined by:
  - Calculating the replacement value for standard utility assets, using Modern Equivalent Asset (MEA) values, typically from regulators' schedules
  - Optimizing infrastructure layout designs from an engineering perspective (avoiding over-design)
  - Determining the replacement cost of the optimised infrastructure layout using the MEA values
  - Depreciating the assets based on their age, in terms of the standard asset life-spans contained in the regulators' schedules

ODRC Valuation (2)

- Advantages of using the ODRC methodology are:
  - Technological changes are accounted for
  - Inflation is accounted for
  - “Gold-plating” (i.e. over-design of assets, unnecessary assets) is avoided
  - Matches the economic value when inflation is high
  - Gives an indication of capital costs to potential market entrants
  - Does not rely on historical acquisition records
  - Customers are protected
  - Public confident that regulated entities are efficient

ODRC Valuation (3)

- Historical Cost Records lost
- Remaining life uncertain
- A distribution feeder in New Zealand
- Major investment in re-building asset registers around 2000



ODRC Valuation (4)

- Over-design?
- A substation built on top of a Regional company office in HK
- HK had RoR regulation with guaranteed return of 15% in 2004

ODRC Valuation (5)

- Potential disadvantages of using the ODRC methodology are:
  - The level of complexity is higher
  - The amount of data required is greater (including the preparation of standard replacement cost and life-span schedules)
  - The existing register data is usually in a format that requires conversion
  - The methodology requires staff (of regulator and utility) to be well versed in the theory

International Perspective

Major Asset Valuation Methodologies used by Regulatory Sector				
Sector	Australia	Canada	UK	US
Airports	Mostly DORC		IMV	
Gas	For initial valuation can be ODV, DORC, purchase price	DHC	IMV	DHC
Electricity	Deprival Value/DORC	DHC	IMV	DHC
Rail	Typically DORC	DHC	IMV	DHC
Telecom	TSLRIC		LRIC	TELRIC/DHC where building blocks
Water	DORC & ODV		IMV	DHC

IMV – Initial Market Value; LRIC – Long Run Incremental Cost; TSLRIC – Total Service Long Run Incremental Cost; TELRIC – Total Element Long Run Incremental Cost

Thank You

Proceed to next session