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***Illustrative Example of the
Application of the Proposed
Capital Investment (CI) Factor
(Report for HONI, 14 August 2006, p. 10)***

Technical Workshop: Sept 18-22, 2006





The Capital Investment (CI) Factor

- ERAI's Report recommends that a CI-Factor be incorporated into the price cap formula proposed by Staff. The formula would become:

$$\% \Delta P = K + \% \Delta GDP / PI - X + Z + CI$$

Where

CI is the % increase in rates required to recover the costs (capital cost plus depreciation) associated with significant new capital investment in the rate year.



CI-Factor vs. Z-Factor

- CI-Factor is similar to a Z-factor, except:
 - The **Z-factor** is for uncontrollable/unforeseen events (e.g., ice storm?) that have a significant financial impact.
 - The **CI-factor** is for controllable/foreseen investments (e.g., major rebuild) with a significant financial impact.
 - Because these capital investments are controllable (i.e., can be deferred), they respond to penalties/disincentives which is the problem.

Pre-Conditions for the CI-Factor



- Any LDC wishing to utilize the CI-Factor would be required to file an Asset Condition Assessment Study acceptable to the OEB that demonstrates the need for significant capital investment to maintain reliable service.
- The CI-Factor is applicable only if significant capital expenditures are required (e.g., CI-Factor > 0.5%) based on a detailed capital plan, if available, or on trend analysis and the Asset Condition Assessment Study.
- Hence, CI-factor is essential to the ability of LDCs to maintain SQIs and performance at expected levels.

Calculation Methodology



Determining the CI-Factor requires a three step calculation:

1. Determine the % growth in rate base due to the increase in fixed assets
2. Deduct price cap escalator and % load growth
3. Multiply the result by the ratio of capital-related costs to total revenue requirement.

Voilà!



1. Percentage Growth in Rate Base

The % growth in rate base is approximated as:

- New capital investment (I) minus depreciation (D) (i.e., the increase in the net fixed assets) divided by the prior year's rate base (B_{t-1})

Hence,

$$\% \Delta B_t = \% (I - D) / B_{t-1}$$

2. Offsets



The percentage increase in the rate base ($\% \Delta B_t$) is offset by:

- The price cap escalation factor ($\% \Delta GDPPIPI - X$), which implicitly increases all cost components, including capital-related costs, and
- The load growth ($\% \Delta L$), which provides additional revenue that offsets a proportional increase in all costs including capital costs.

Hence, the total offsets equal

$$(\% \Delta GDPPIPI - X) + \% \Delta L$$



3. Capital Cost Ratio

- The increase in rates that is needed to compensate for the incremental capital investment corresponds to the ratio of capital costs (C) to the total revenue requirement (R)

Hence, the CI-Factor is the combination of

[Rate Base Growth – Offsets][Capital Cost Ratio]*

$$CI = [\% \Delta B_t - ((\% \Delta GDPPIPI - X) + \% \Delta L)] * [C/R]$$

Illustrative Example



➤ Assume:

B_{t-1} = prior year rate base = \$100

I = capital investment = \$7

D = depreciation = \$2

C = capital-related costs (depreciation & capital cost) = \$10

R = revenue requirement = \$20

$\% \Delta L$ = load growth = 2%

$(\% \Delta GDPIPI - X)$ = price cap escalator = 1%

Then

$$\% \Delta B_t = \% (I - D) / B_{t-1} = (7 - 2) / 100 = 5\%$$

$$CI = [\% \Delta B_t - \{(\% \Delta GDPIPI - X) + \% \Delta L\}] * [C/R]$$
$$= [5 - \{1 + 2\}] * [10/20] = 1\%$$



Conclusion

- With the CI-factor, an LDC with significant capital requirements will not be penalized for undertaking capital investment needed to maintain or attain SQIs.
- Prudent spending can be ensured by reviewing capital expenditures as part of the LDC's future rebasing filing.
- Further, LDCs with significant capital plans will be required to undertake Asset Condition Assessments prior to embarking on their major capital programs.