

Comments on Draft Tariff Regulations of CERC

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Issues Covered

- Use of net equity instead of gross equity to calculate return
- Asymmetric division of hydrological risk for hydro plants
- Norms for heat rates of coal power plants

Use Net Equity not Gross Equity for Calculating Return

- Current approach
 - Allows repayment of loan in 12 years, and depreciation = annual pymnts
 - After 12 years, net assets of equity only and equal to 30% of original investment
 - Straight-line depreciation until end of life
- Return should be on net equity = initial equity less cumulative depreciation of equity component.
 - Not gross equity

Reasons for Using Net Equity

- Conceptually correct approach.
- Return “of” investment through depreciation. Return “on” investment should only be on remaining equity (initial equity less accumulated depreciation)
- Depreciation accounting and calc of return should be consistent.
 - Generator can invest amount returned as depreciation, and earn return.
 - Requiring consumers to also pay return on these amounts (gross equity approach) equivalent to allowing generator to earn a return on same amount twice.
- Using gross equity unfair to consumers
 - Equivalent to taking loan from bank, making regular payments to return the principal, yet being required to pay interest on the total initial amount of the loan until the end of the loan period.
- For coal plants with 25 year life and 12 yr loan repayment, use of gross equity effectively gives return of 17.25% instead of 15.5% as stated in regs.
 - Shorter the repayment period for loans, the greater effective return.

CERC Reasons for Proposing Gross Equity

- Lower returns under net equity, may discourage investors.
 - Sector facing challenges: fuel, land, water availability

Use of gross equity conceptually flawed. Non-transparent and incorrect way of augmenting returns from level stated in regulations.
- Power Grid - APTEL decision rejecting NFA

APTEL decision based on: (1) uniform application of rules; and (2) note from MoP supporting gross equity. Decision did not look into merits of net vs gross equity.

PLF Incentive

- Draft regulations (30(4)) fix incentive at 50 P/kWh
 - But no reasons given (Explanatory Memorandum, Section 15.5.9)
- Why separate and additional incentive needed?
 - Full recovery of fixed cost based on availability
 - Merit order despatch ensures appropriate PLF
- Large increase in return for generators
 - For example, an incentive for PLF = 90%, adds ~10% to normal return in early years
 - Can be much more as % in later years (assuming use of net equity to calculate return)

Hydro Tariffs –

Asymmetric Sharing of Hydrological Risks

- Energy Charge based on design energy (DE).
 - *Design energy = level met or exceeded in 9 out of 10 years.*
- If energy greater than DE, generator keeps additional revenue
- If energy falls below DE, generator is compensated by ↑ in energy charge
- Asymmetric division of hydrological risks.
 - Downside borne by consumers, up-side benefits kept by generator.

Consequences of Skewed Risk Sharing

- Lack of econ incentive for using realistic hydrological data or optimum designs for hydro power.
- 89% of hydro projects delivering less electricity than estimated.
 - More than half the hydro projects have 90% dependable point at less than 50% of DE.
- Under-performance is an indicator of the level of over-design of hydro projects

Data on performance of hydro projects is from unpublished analysis by South Asia Network on Dams, Rivers and People (SANDRP).

Level of Under-Performance of Hydro Projects That Do Not Meet Design Energy

Level of Under Performance (Actual 90% Energy/Design Energy) (percent)	Number of Projects	Number of Projects	Share of Total (percent)
0-9	18	119	55%
10-19	16		
20-29	36		
30-39	25		
40-49	24		
50-59	24	72	33%
60-69	13		
70-79	9		
80-89	15		
90-99	11		

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Consequences of Over-Design of Hydro Projects

- Higher costs → higher tariffs
- Increased environmental and social damage
 - Larger than necessary tunnels
 - Excessive forest clearance and land acquisition
- Much of new hydro to come up in areas with fragile ecosystems
 - Exacerbates harm from over design
- Removing asymmetry of risk sharing in tariff regs → optimum design, lower cost, lower environmental damage, reduced land acquisition.

Recommendation: Difficult to shift risk for existing plants because of potentially huge shortfall in revenue. But must for new hydro plants.

Norms for Coal Plant Heat Rates

- Norms tightened but more needed
 - Instead of tightening every 5 years, need for on-going, self-reinforcing mechanism
- Use net heat rate (NHR) instead of gross heat rate
 - Avoid separate norm for aux power
 - Focus on issue of interest – how much electricity to grid per unit of coal
 - Compatibility with PAT scheme

Preferred Mechanism for Setting Heat Rates

- Apply to all coal plants (central and state, public and private) in country
- Segregate by size
- Set norm equal to median net heat rate (MNHR)
- Plants below MNHR incentivized to improve to reduce loss of revenue → MNHR will ↓.
- Better performing plants will also improve to remain lower than MNHR as it falls.
- Result: convergence to higher perf level (lower MNHR), lower std deviation.

Challenges for Implementing Preferred Approach Immediately

- Unit wise HR not available and not measured
- Many state plants poor performers, will pull down benchmark perf
- Need for interim period for preparation

Preparatory Activities during Interim Period

- Install systems for unit-wise heat rates
- Plants to improve monitoring and control of coal
 - CPRI study for Maharashtra Genco
 - Gravimetric feeders available to measure coal flow into units.
 - CERC should review study for applicability to plants under its jurisdiction
 - Disseminate information to all plants
 - Encourage adoption of best practice

Heat Rate Norm During Interim Period

- CERC should select, for each plant, lower of:
 - Design NHR + x% (x to be determined)
 - Norms set in PAT scheme.

Recommendations

- Use net equity and not gross equity to calculate return
- For new hydro plants, shift risk of energy below DE to generators.
 - Consider reducing DE threshold from 90% dependable year. (Less than 90%)
- In the next revision of tariff regs, set norm for heat rates for coal plants at MNHR.
- In the current revision, set norm on lower of: (1) DNHR + x%; and (2) PAT level.
- Require installation of measurement and monitoring at unit level, within next 3 years.