GUIDELINES FOR TARIFF INCREASES AND SUBSIDY REDUCTION

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CONSUMER'S CONCERN

- Consumers worry more about ***expenditures*** than ***prices/tariffs***
- Expenditures can be held constant (or even decreased) under price/tariff increases!
- How?

TARIFF INCREASE ONLY *AFTER* EFFICIENCY IMPROVEMENT

- Improvement of equipment efficiency => lower electricity consumption => compensation for higher tariff
- If consumption = 100 units/ month => bill = Rs 200/month @ Rs 2.00/unit
- If improved device uses 75 units/month, then consumer could pay Rs 200/75 = Rs 2.67/unit ***w/o*** increasing expenditure

TARIFF INCREASES WITH EFFICIENCY IMPROVEMENT

- How to ensure that there will be no expenditure increase with tariff increase
- New tariff P_a (after efficiency improvement) must not be greater than $[(P_b \times Q_b) / (Q_a)]$ where P_b = tariff before increase, and Q_b and Q_a = consumption before and after efficiency improvement and tariff increase

POOR QUALITY ELECTRICITY CAUSES EXTRA EXPENDITURES

- Consumers incur extra expenditures to prevent/rectify damage to equipment caused by poor quality electricity (low voltage, low frequency, irregular supply)
- Suppliers get away with this damage only because there is no competition to take away their customers

AVOID ADDING INSULT (TARIFF INCREASES) TO INJURY (POOR QUALITY ELECTRICITY)

- But utilities may not be able to get away with a tariff increase superimposed on poor quality
- Hence, there must be improvement In power quality ***before*** tariff increase

TARIFF INCREASES FOR *RELIABLE* ELECTRICITY

- Rather than incur extra expenditure from subsidized ***unreliable*** electricity, most consumers would be prepared to pay higher tariff for ***reliable*** electricity
- But ***before*** tariff is increased (for reliable electricity), demonstration projects should reveal improvement of supply quality and prove benefits to consumers.

SUBSIDIES TO THE POWER SECTOR

- Subsidies promote waste and discourage efficiency
- There should be no net subsidies to power sector
- Cross-subsidies (from one consumer category to another) permissible with consumer consent up to a limit

DISCOURAGING CONSUMERS FROM WASTING ELECTRICITY

- Two options: tariff increases versus efficient equipment
- If consumers' demand is ***inelastic*** (i.e., does not decrease even after price increases), tariff increase may not reduce electricity demand
- Improving equipment efficiency is better than mere tariff increases

IMPLICIT INCORPORATION OF EFFICIENCY IMPROVEMENTS VIA ENERGY PRICES

- ***DOUBLE ELASTICITY MODEL***
- $ED = f(GDP, P) = A \cdot GDP^{a} \cdot P^{-b}$
- $\ln ED = \ln A + a \ln GDP - b \ln P$

$a = (d \ln ED / d \ln GDP)_{P}$

$= GDP\ Elasticity\ of\ ED$

$-b = (d \ln ED / d \ln P)_{GDP}$

$= Price\ Elasticity\ of\ ED$

PROBLEMS WITH ELASTICITIES

- Elasticities are difficult to measure and vary a great deal
- Price elasticities overemphasize role of prices
- Any change not explained by GDP is ascribed to price including non-price-related measures

PROBLEMS WITH ELASTICITIES

- Price elasticities cannot cope with following problems:
  - How will future price increases affect ED and carrier substitution
  - What is the role of non-price-related measures
  - How will economy (e.g.recession) will affect ED

PROBLEMS WITH ELASTICITIES

- Elasticities are black boxes that don't explain how prices affect ED

  e.g. Price elasticity of household demand will integrate effect of prices on

  – level of ED

  – changes in existing EU equipment

  – choice of new equipment

EXPLICIT INCORPORATION OF EFFICIENCY IMPROVEMENT

If c = rate of EI,

then $ED = A \cdot GDP^a / (1+c)^n$

$ED(t) / ED(0) = [GDP(t)/GDP(0)]^a / (1+c)^n$

$(1+g_{ED})\ (1+c) = (1+g_{GDP})^a = 1+a\ g_{GDP}$

$a_{eff} = g_{ED}/g_{GDP} = a_{FE}\ (c/g_{GDP})/1+c$

$a_{FE} = a\ (c = 0)$

$$ED = A.\ GDP^{a}\ P^{-b} / (1+c)^{n}$$

P^{-b} = Price-induced efficiency improvement

$(1+c)^{n}$ = Non-price-induced efficiency improvement

BETTER TO SUBSIDIZE EFFICIENT EQUIPMENT THAN SUBSIDIZE ELECTRICITY

- Some consumers may be unable to pay first cost of efficient equipment
- Financing schemes to lower/defer first costs for promotion of improved equipment and reduction in energy demand
- Subsidy (with sunset clause) should be restricted to emerging technologies