**Tariff Setting in the Electric Power Sector**

*Base paper on Indian Case Study*

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Introduction

Tariff setting is a primary instrument of economic regulation. Tariff provides economic signals, which determine the volume and nature of demand and supply. It is not surprising therefore that a considerable portion of the reform effort is expended on rationalizing tariffs, often disproportionately so1. It is attractive to assume that the financial viability of the distribution business can be improved merely through technical corrections to the design and the level of tariff. The experience shows otherwise. Regulatory Commissions have been constrained from more efficient tariff setting due to the non responsiveness of public utilities to economic signals, continued poor quality, high cost and inefficiency of supply. Tariff reform can improve allocative efficiency by providing better price signals. It can increase the revenue inflow in those consumer classes where costs are currently under recovered. However, by implication, tariff reform will reduce the revenue inflow, at least in the short run, in those consumer classes, which currently cross subsidize others. The net financial impact of tariff reform can therefore be ambivalent from the near term perspective and crucially dependent on appropriate sequencing. For restoring the financial viability of utilities and bridging the revenue gap, tariff reform must be accompanied by adequate financial support from the government during the transition period and speedy and efficient restructuring of utilities along the lines of corporatization, commercialization and privatization.

It is now widely accepted that regulation is only a second best alternative. It is best when it can mimic market signals. The widely held view of the efficacy of regulation is the primary source of pressure on tariff regulators to behave like an efficient market. Since the markets are efficiency oriented, rewarding efficient agents and penalizing inefficient ones, the cost of service approach in tariff regulation has evolved into a performance based approach which incentivises efficient suppliers. Since markets provide elbow room to suppliers to mange their affairs without interference the Price or Revenue Cap approach to tariff setting was a subsequent development which attempted to mirror the free play of the market. The Retail Price Index approach is the most recent evolution in this trend.

India has a long history of experience with cost of service regulation. Its experience with performance based regulation is a decade old while it has no formal experience with either the revenue cap or the price cap or the RPI minus X approach. This paper identifies the financial imperatives for reform, reviews the evolution of the legislative basis and the nature of tariff regulation, evaluates the experiences with reform, surveys the literature and international experience, highlights unresolved issues and provides options for the future.

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1 Ahluwalia, Sanjeev S. “Tariff Reform in India; A review of directions and issues” in Transition to a Liberalized Environment, TERI 1999.
The financial imperative for reform

The financial viability of the electricity business in India has worsened over time. The losses of the nineteen State Electricity SEBs (SEBs), which supply around 95 percent of electricity consumed, have increased from Rs 45.6 billion in 1993/93 to Rs 123.2 billion in 1998/99. If the opportunity cost of capital calculated at the minimum rate of 3 percent on net assets, prescribed by the Electricity (Supply) Act, 1948 [E (S) A] is added to the financial loss incurred by the SEBs, the loss in 1998/99 increases to Rs 187 billion.

High transmission and distribution loss, low utilisation of installed capacity, high manpower costs and distorted tariff are the factors contributing to the sub optimal performance. Agricultural and domestic consumers consumed nearly one half of the energy supplied in 1998/99. Both consumer categories are heavily undercharged. On an average, supply to agriculture recovered only 12 percent of the average cost of supply while supply to domestic consumers recovered only 54 percent of the average cost of supply. Conversely, supply to industry recovered 122 percent of the average cost of supply. If revenue realization is compared to the marginal cost of supply for these categories of consumers, the distortions become even more extreme. Graph 1 below compares average electricity prices in the domestic sector across developed and developing countries.

Graph 1: Household electricity prices in 1997

This section borrows heavily from “The Electric Power Sector in India” a status paper, January 1999 prepared for the NCAER, New Delhi by Sanjeev S. Ahluwalia.

It illustrates the low average prices for household supply of electricity in India even as compared to some developing countries. Graph 2 illustrates the relatively higher prices charged to industry on average in India.

Electricity prices for industry in India are higher than most developed economies, excluding Japan, and several developing countries. This distorted tariff pattern in India has been designed to cross subsidize domestic and agricultural supply by charging industry more than the average cost of supply. In most SEBs, the tariff for industry exceeds even the marginal cost of supply. This has resulted in self-generation being increasingly adopted by industry as a cheaper and more reliable source of power, thereby further eroding the financial viability of the SEBs.

The financial position of the Licensees has generally been better because they were more efficient but also because they had a limited volume of agricultural supply and were able to bill and collect revenue from their domestic consumers who were primarily in the urban areas unlike SEBs which serve a mixed load in rural and urban areas. Similarly the financial position of the central sector entities like NTPC, NHPC and POWERGRID and functionally unbundled generators, like Karnataka Power Corporation, owned by the state governments was satisfactory because they have been insulated from the financial non-viability of distribution. However, as more and more SEB’s get functionally unbundled and IPPs are established, all of which want contractual guarantees, reimbursement of fixed charges and in some cases minimum off-take, the inadequate revenue generation in distribution has become a barrier for incremental capacity installation. In the case of the central sector
entities, the inadequate financial viability of the SEBs is reflected in the mounting dues, which remain unpaid by the SEBs.

SEB losses are financed from the budgets of state governments. These losses are partially offset by the receipt of subsidy from the state governments. State government finances have been under stress in the nineties. The revenue deficit of states increased from Rs 53.1 billion or 0.99 percent of GDP in 1990/91 to Rs 404.9 billion or 2.30 percent of GDP in 1998/99. Relative to the total revenue receipts of the states, which is a fair indicator of the capacity of the states to subsidize the losses of the SEBs, the loss of the nineteen major SEBs increased from 5 percent of revenue receipts of the states in 1992/93 to 6.5 percent in 1998/99. If the opportunity cost of the capital invested in the assets of these nineteen SEBs is also accounted for, the loss of SEBs in 1998/99 increases to Rs 187 billion which is nearly 10 percent of the revenue receipts of state governments in that year. Since the state government finances the losses of the SEBs, financial imbalance in the SEBs has had a significant impact on the fiscal imbalance in state finances. Gujarat provides Rs 1260 crores per annum as subsidy while the allocation for power subsidy in Andhra Pradesh is Rs 1345 crores. These are resources, which the state governments are diverting from pressing requirements in the health, education and social welfare sectors. It is not surprising therefore that reform of the power sector should constitute a very major part of the more general process of economic reform and that within the power sector, attention should be focussed on tariff reform. It is however somewhat naïve to expect that tariff reform can be implemented in isolation of a change in the managerial effectiveness of public utilities or a restructuring of the industry.

**Review of the Legislative provisions and trends in Tariff Setting**

*Indian Electricity Act, 1910*

The legal provisions for the regulation of tariffs of power utilities can be traced to the Indian Electricity Act 1910 (IE Act). However, in keeping with the perceptions of the times, there was no attempt at being prescriptive by specifying, either the principles, or the methodology to be followed for tariff setting, beyond enjoining that tariff must be non discriminatory and allow a reasonable return to the licensee.

*Electricity (Supply) Act, 1948*

The first attempt to closely regulate monopolistic power utilities by defining the basis on which tariffs could be charged was made in the Electricity (Supply) Act, 1948 [E (S) Act]. At the time there were two types of entities in the power sector; Licensees under the IE Act and State Electricity Boards (SEBs) created by the E (S) Act. Schedule VI of the E (S) Act

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4 State Finances; A study of budgets of 1999-2000, January 2000, RBI.

5 This section borrows heavily from the Central Electricity Regulatory Commission (CERC), Consultation Paper on Bulk Electricity Tariffs, September 15, 1999.
prescribed the methodology to be followed for the determination of the tariffs of power utilities, which were Licensees under the IE Act. This is a detailed cost plus methodology where the rate of return on the capital invested is regulated and a cap is imposed on the clear profit of the licensee. In the case of Licensees it has worked satisfactorily from the viewpoint of financial viability of the utility. The E (S) Act also established the SEBs, which were expected to supplement the efforts of the private Licensees. Section 59 of the E (S) Act therefore provided the basis for tariff determination of the SEBs. As originally formulated, it simply enjoined the SEBs to adjust their charges from time to time so as not to conduct their business at a loss after accounting for subventions received from government. It also envisaged that there may be need to meet expenses on operation and maintenance from capital to be sanctioned by the state government. This was clearly in sharp contrast to the existing provisions for Licensees who were left free to recover charges as appropriate from the consumers. Act 23 of 1978 amended Section 59 of the E (S) Act to specify that the tariff was to be so adjusted so that SEBs earned at least a surplus, after accounting for all subventions and costs, including tax. The rate at which such surplus (defined as income less expenditure, including interest and depreciation) was to be recovered was left to be specified by the state government. Act 16 of 1983 further amended the section to the form in which it stands till today. SEBs were required to so adjust tariffs so as to earn a surplus (defined as income less all costs, including interest on debt) of at least 3 percent. State governments could also specify a higher rate for the generation of surplus. Generally states did not actually do so and SEBs have been unable even to generate the specified minimum surplus.

Till the establishment of central generating stations in the early 1980’s, the industry was dominated by private Licensees and vertically integrated SEBs. SEBs could purchase electric power from any person under the provisions of section 43 of the E (S) Act on terms as agreed between the contracting parties. However no defining principles were available for tariff setting and tariffs for individual stations were decided on the basis of mutual consent between the generator and the consuming SEBs. The absence of mandatory norms for tariff setting are said to have led to delays in settlement of commercial terms and required extensive negotiation de novo for every station. This was perceived to be inefficient. Consequently the central government constituted a committee under the chairmanship of Shri K. P. Rao Member (E&C) CEA to recommend alternative methods for the determination of generation tariffs of central stations.

The recommendations of the K.P. Rao Committee can be regarded as a landmark in the history of bulk tariff regulation in India. Four recommendations, which were implemented, significantly altered the tariff setting methodology.

First, the concept of two-part tariff, comprising fixed and variable charges respectively was accepted, though it was only implemented in part. This enabled formal identification of the fixed cost incurred by the generator.
Second, the concept of “deemed generation” was introduced, which delinked the payment of fixed charges from use. Henceforth generators were to recover their fixed cost even if an “available” station was backed down due to system constraint.

Third, changes in risk allocation and efficiency linked returns were effected in the existing incentive structure. Till 1991, the single part tariff was calculated such that full recovery of fixed costs was assured at a PLF of 62.8 percent. Generation below this target level penalized the generator on the recovery of fixed cost, since the tariff got proportionately reduced. Conversely generation above 68.5 percent resulted in significant excess revenue. The formula adopted post 1991 limited both the incentive and disincentive for recovery of fixed costs. The incentive beyond 68.5 percent PLF was lower than before while even with nil generation, 50 percent of the fixed cost was recoverable.

Fourth, for the first time, operational norms were determined for station heat rate, auxiliary power consumption and specific oil consumption. More importantly, the norms were challenging relative to average performance levels at the time and hence laid the basis for Performance Based Ratemaking.

Act No 50 of 1991, introduced Section 43A of the E (S) Act, which specifies that in the case of government owned generating companies, the tariff would be decided by the state or central governments whoever owned the company. Tariff was determined on the basis of operational norms and PLF as determined by the CEA while the rates for depreciation and reasonable return were to be notified by the central government. It was under these provisions that some of the recommendations of the K. P. Rao Committee were notified by the central government and came to be used in tariff determination of central stations.

The Amendment Act No 50 of 1991 also changed the definition of “generating company” to include privately owned generating companies. Accordingly, a fresh set of norms were notified by the central government on March 30, 1992 to determine tariff for both thermal and hydro generating stations to be set up by the Independent Power Producers (IPP) in the private sector. These have been subsequently modified from time to time. Four primary changes were introduced in the determinants of tariff.

First, the recovery of fixed costs was linked to deemed PLF (defined as PLF plus Deemed Generation) thereby making a departure from the past wherein the recovery of fixed costs was linked only to the PLF achieved.

Second, the incentive structure was further revised. In the case of thermal generation the deemed PLF for full recovery of fixed charges was fixed at 68.5 percent. For hydro power the target availability was 90 percent (subsequently reduced to 85 percent in 1998). An incentive in the form of an increase in ROE of upto 0.7 percent points for every 1 percent point increase in deemed PLF was determined along with a penalty calculated as a pro rata reduction in the recovery of fixed cost for deemed PLF below the target level.
Third, along with the increase in the rate applicable for the central generators from 10 percent to 12 percent, the Return on Equity for IPPs was fixed at 16 percent per annum. Central generators in turn benefited from the rate set in 1991 for IPPs when on November 1, 1998 their return was also revised upwards to 16%.

Fourth, against the notional debt equity ratio of 50:50 for central generators, the debt equity ratio for IPPs was revised and the minimum level of equity fixed at 20 percent. The minimum stake of the promoter to be held as equity was fixed at 11 percent of the total capital. A cap was imposed on financing from the Indian Financial Institutions at 40 percent of total outlay (which has subsequently been relaxed).

Fifth, upto 100 percent foreign equity was permitted with foreign exchange risk protection.

**Transmission**

Separate provisions for transmission tariff do not explicitly exist in any of the electricity laws. This is not surprising since unbundled transmission did not exist till the establishment of POWERGRID in 1989. In fact POWERGRID is treated as a generation company under the definition provided in the E(S) Act. The assets of POWERGRID, the sole central government transmission company, were transferred to it from NTPC and NHPC. Tariff was determined and notified by the central government on the basis of techno economic approvals of investments given by the CEA. Consequently the notification dated December 17, 1997 was the first attempt to formalize the methodology of tariff setting. It prescribes a single part tariff comprising all costs on account of interest on outstanding loans and working capital, return on equity, depreciation, O&M expenses as per norms and income tax. The full cost is recoverable at an availability of 95 percent. An incentive is given in the form of increase in ROE at the rate of upto 1 percent point for every 1 percent point increase in availability. A debt equity ratio within the norm of 80 percent maximum and 20 percent minimum has been used for POWERGRID while the rate of ROE is the same as for generation.

In 1998, prior to the coming into effect of the Electricity Regulatory Commissions Act (ERC Act), five sets of norms for tariff setting were in force. One set of norms, specified by schedule VI of the E (S) Act, determines the retail tariff of Licensees under the IE Act. The second set of norms under section 59 of the E(S) Act determines the retail tariff of SEBs. The third set of norms specified by the central government under section 43 A (2) of the E (S) Act determines the bulk tariff of central stations. The fourth set of norms under the section 43 A (2) specifies the bulk tariff for IPPs. The fifth set of norms specifies the transmission tariff for POWERGRID, the sole central transmission company. There is a fair degree of commonality in all the five sets of norms though they are not identical. The effectiveness of all the five sets of norms, in providing incentives for continuous improvements in performance standards, can be questioned. Their relevance in the light of changes in the macro environment and the rapid evolution of the Indian Power Industry may also be in doubt. However, it is well established that each represents an evolutionary stage,
which improved the effectiveness of the regulatory regime in place at the time that these
norms were formulated. It is just as clear that significant adjustments are now required if the
positive trend, in evidence since 1948, in the evolution of tariff regulation in India is to be
maintained.

The legislative changes since 1995 are the next stage in the evolution of power tariff in
India. There were three primary changes introduced at that time. First, the constitution of
Independent Regulatory Commissions was a major step in the evolution of the process of
tariff setting. Second, for the first time the principles of tariff determination were set down in
detail in the Act, thus providing a legislative backup to the process of tariff rationalization.
Third, for the first time the Act provides a perspective for the future, emphasizing
competition, economy, efficiency and equity. We will consider each aspect in detail

**The process of independent regulation**

*The introduction of transparency*

The process of tariff determination was traditionally a non-transparent, closed-door exercise.
Inadequate data and poor facilities for information collection and dissemination handicapped
technical analysis and the use of economic tools. In contrast, the State Commissions, earlier
in Orissa and subsequently since May 2000 in Maharashtra, Andhra Pradesh, UP and
Gujarat, demonstrated keen interest in making the process transparent by involving
stakeholders through a process of dialogue. Towards this end, a number of State
Commissions as well as the Central Commission have come out with position papers on
different issues concerning the industry, notably on tariff. Some of the Commissions also
issued consultation papers on other aspects related to tariff regulation such as cost of
capital by CERC and on captive power policy by UPERC.

The universal adoption of the public hearing route by the Commissions is noteworthy
because the reform Acts do not make public hearings mandatory. However, the fact that
Commissions have the powers of a Civil Court and appeals from their decisions are heard in
the High Court may have influenced this trend towards purity of judicial process. It is
interesting that India is not unique in this trend. Despite the fact that the Federal Power Act
1935 of the United States specifically exempts hearings in the FERC from the strict judicial
process, the trend has been to comply with the due process. The mere exercise of quasi-
judicial powers appears to enforce the discipline of the judicial mode of functioning. However
Indian regulators have been innovative in their application of the due process. Open house
sessions were conducted by the Gujarat Commission where a number of issues, including
broader aspects like restructuring etc were discussed. Maharashtra and Uttar Pradesh
adopted a very proactive approach of actually reaching out to consumers at six and five
locations respectively. An important change brought about by this process is informed
decision making made possible by access to data that was earlier not available.

The tariff orders issued by the Commissions have been an important source of this
information. The tariff awards issued by all the regulatory commissions are voluminous
documents with lot of data and information. Time constraints and lack of experience with the process probably constrained a more participative approach.

Table-1 below summarizes the picture on the process adopted and availability of relevant information in the tariff orders issued by the Commissions.

Table-1: Process and information in the tariff orders

<table>
<thead>
<tr>
<th></th>
<th>A.P.</th>
<th>Gujarat</th>
<th>Mahara shtra</th>
<th>Orissa</th>
<th>U.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearings at multiple locations*</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
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<tr>
<td>Circulation of draft order</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Calculation of revenue realized with its components from tariff determined by the Commission for the ensuing financial year</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Revenue from existing tariff for the ensuing financial year</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Calculation and rationale for demand forecast</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Date of public notice and last date for inviting objections</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Number of objections received</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* In Gujarat, these took form of informal open house sessions.

While the move is in the correct direction, a lot more effort in this direction would be required in the future. Lack of rapport and information along with vested interests hurt by the regulatory decisions, could easily backlash into street agitations et al leading to the danger that independent regulation, instead of being a mechanism to resolve conflict and build consensus ends up as an instrument of triggering social, economic and political conflicts.

We recognize here that the regulatory outcomes are invariably affected by a number of constraints, including the informational, transactional and administrative and political constraints, which prevent the regulator from implementing his or her preferred policy. The adoption of an inclusive, participatory process under the independent regulation increases the time taken in decision making. However, the time consuming nature of the judicial process becomes less of a real problem when viewed in the context of actual administrative decision making trends in the past. The history of irregular revision of tariffs indicates that timeliness was not one of the virtues of the pattern of administrative decision making. In Gujarat, for example, the tariff revision has been sporadic and long drawn

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6 More than 75 pages in all cases, some of them being close to 200 pages.


exercise in the past. The last general tariff revision for consumers supplied at low tension was effected in January 1992 while for those supplied at high tension was effected in May 1993. A further change for industrial consumers and for railways was effected in October 1996. It however appears unrealistic to expect that the time taken for decision making will improve under independent regulation. A quick survey of the international literature reveals that the regulatory process of resetting the tariff takes anywhere between eighteen to twenty-four months and is accompanied by a series of consultations\(^9\). In the Indian context, Commissions have bound themselves down to ambitious decision making time frames ranging from three to six months. The result has often been that less concern is given to a wider and more active participation by all stakeholders. There is therefore some truth in the statement that the decision making time frames need to be reviewed in the interests of inclusion, adequacy of information and hence more efficient decision making. Table-2 below presents the details in context of the time taken by different commissions to issue the tariff awards. Gujarat is an interesting deviation where, for reasons discussed later, the tariff order could be issued in more than one year but has resulted in a more participative approach whereby extended hearings were conducted and in richness of information contained in the order.

Table-2: Comparison of the time taken to release the tariff order

<table>
<thead>
<tr>
<th></th>
<th>Date of first submission</th>
<th>Date of tariff order</th>
<th>Time to release tariff order</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.P.</td>
<td>December 29, 1999</td>
<td>May 27, 2000</td>
<td>5.0 months</td>
<td></td>
</tr>
<tr>
<td>Gujarat</td>
<td>September 14, 1999</td>
<td>October 10, 2000</td>
<td>13.0 months</td>
<td></td>
</tr>
<tr>
<td>Maharashtra</td>
<td>October 15, 1999</td>
<td>May 5, 2000</td>
<td>6.5 months</td>
<td></td>
</tr>
<tr>
<td>Orissa</td>
<td>August 17, 1999</td>
<td>December 30, 2000</td>
<td>4.5 months</td>
<td>Case No. 12 of 1999</td>
</tr>
<tr>
<td>U.P.</td>
<td>Feb 15, 2000</td>
<td>July 27, 2000</td>
<td>5.5 months</td>
<td>Dec 31 submission ignored due to enactment of the Reform Act</td>
</tr>
</tbody>
</table>

Functioning, as they do in an environment of data uncertainty and inadequacy of qualified staff, the process of decision making within Commissions tends to be evolutionary. Specifically, regulators may have one prima facie view at the time a petition is submitted. However, after hearing all parties and in the process, discovering additional data and facts, including frequent and significant amendments to data by the parties, the view of the regulators may change considerably. Frequently, a hitherto unexplored line of analysis and evaluation may open up once the hearings have been completed. The inclusion of these deliberations in the decision risks being termed as violative of the basic principle of the judicial process where all parties must get a chance to debate the evidence on which the judge wishes to rely. There are two options for tackling this problem. Either the additional

Evidence can be subjected to a hearing process or it can be incorporated into a decision and the decision itself subjected to a hearing. The latter case implies the issue of a draft order on which comments are invited from all parties. This is a departure from the strict requirements of the judicial process. However it has some validity in the context of regulation being intrinsically different from the exercise of judicial powers. The issue of a draft order enables all parties to react to the displayed mind of the Commission and hence point out areas where they feel the decision is not based on facts, errs in analysis or is otherwise bad in law. This may also avoid an unnecessary resort to appeals. Even if the case goes to the appeal stage, the speaking order of the Commission dealing specifically with the public comments on the draft order will provide an easily understood rationale or justification for the order. The decisions taken by Commissions are highly technical in nature, are very quantitative and involve the adoption of economic philosophies. They do not usually revolve only around questions of law or establishment of relevant facts as the judicial decisions. Hence, allowing parties to react to the mind of the Commission seems fair, just and efficient. It is significant that the process adopted by FERC and by the OFGEM both incorporate the stage of a draft order on which parties get an opportunity to comment and not just on the pleadings of the opposite parties. It is obvious that incorporating the stage of a draft order will increase the time taken for disposal. It may also not be necessary for all cases. Non contested cases, or contested cases of a routine nature where the issues are restricted to establishment of facts may not need this additional stage. However in all cases which have characteristics of rule making, where the consequences are to spill over to other cases, where a fundamental principle is being established, the incorporation of a stage of issuing a draft order can be considered as a measure of process reform.

Empowerment of stakeholders

The strength of the judicial process is that it provides a forum for the thorough exchange of information, facts and opinions between all parties. The limitation of the process is that any asymmetry between the parties in terms of their competence, access to information or ability to utilize the legal provisions of the process will result in skewed results. In the case of public sector utilities in particular the motivation of the managerial cadre representing the utility impacts considerably on the outcome of the case. In the case of small consumer’s, poor organizational and representational capacity are similarly limiting factors. This is particularly the case for domestic and agricultural consumers. While some of the States like Gujarat have a long history of strong consumer movement, participation by these bodies in the regulatory proceedings has till now been limited. Designation of an independent public advocate/body to represent the interest before the regulatory agency is a desirable component of the regulatory environment. Some of the Commissions, like Gujarat have initiated this practice.

**Independent functioning of the Commission**

The fact that regulatory commissions have necessarily to function in an independent manner and not as an arm of the Government, is acquiring general acceptance. However this does not imply a hands off attitude to be adopted by the government. The relationship between the government and the regulator needs to be one of mutual and constructive support in advancing the public interest. The most notable example is that of Andhra Pradesh, where the Commission received strong support from the Chief Minister who actively campaigned against a roll back of the increase in power tariffs announced by the Commission in May 2000. He likened any roll back to virtual disempowerement of the Commission and felt that such an extreme step would send wrong signals to the prospective investors\(^\text{11}\). In direct contrast however, the commission in Gujarat was not able to issue the tariff award for nearly a year because of the lack of support from the Government. The Observer report from Gandhinagar claimed that the Gujarat government held back a hike in power tariff in a move that was prompted by the elections to six municipal corporations as well as district and sub-district councils\(^\text{12}\). The GERC’s award, which was to come in mid-April 2000 was delayed till October 2000 and though the Commission firmly denies that it was under any pressure, official sources claim that the ruling party had impressed upon the Commission to announce its award after the election to the municipalities and the panchayats, as it might affect the poll prospects\(^\text{13}\). In the case of Maharashtra the state government intervened negatively in attempting to waive off the electricity dues of the power loom owners of Bhiwandi. This resulted in the MERC having to specifically disallow any special concessions to this consumer class and some resultant tension between the Commission and the government. The State Government in Orissa seems to have adopted a hands off approach of not intervening in the sector. While this approach is convenient for the government, it does not however assist the process of financing the transition. The sudden withdrawal of subsidy, as in Orissa, puts extreme pressure, either on the tariff or on the financial viability of the utility, or both. However, the overall trend is positive, in that governments are by and large giving regulators the space required for rational tariff determination. Our optimism gels from the fact that it is not unusual for regulatory institutions to take time to mature and establish their independence and credibility. The legislative underpinnings are important but not the sole criterion for successful regulation. As significant is the track record of regulators in dealing with difficult decisions that involve substantial interest group controversy\(^\text{14}\).

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1\(^{13}\) Desai D. September 13, 2000. "Gujarat in a fix over power sector reforms". An Indian Express report from Gandhinagar.

Regulatory capture by interest groups is another source of potential loss of independence of the regulators. US style regulation has strict "sunlight laws" regulating the conduct of regulators as a group and individually in terms of accepting gifts, communing with interested parties or permitting selective access to information. In India the no specific code of conduct for regulators has been created. Regulators follow a system of self discipline in ensuring that their collective and individual conduct is in consonance with the principles of natural justice unbiased quasi-judicial functioning. India has a tradition of symbiotic relationship between the Public Sector Utilities and Governments. The apprehension is always there that regulators will succumb to a similar relationship. However the record indicates that this has not happened. Regulators have acted independently, against the perceived self interest of public utilities and in favour of the consumers in Orissa, Maharashtra, AP and UP and at the central level. The same is true in the context of the private sector where regulators have attempted to balance the interests of the private sector with that of consumers. Prominent consumer Advocates like Shri Manubhai Shah of CERS (Consumer Education and Research Society), Ahmedabad are not however satisfied at the level of consumer protection afforded by the Commissions. However even he does not deny that the trend is positive and regulatory capture of Commissions by special interest groups has not occurred. The process of independent regulation is far more satisfactory in this regard than that of administrative decision making adopted previously.

Information and technology requirements for efficient regulation

Firms are better off under asymmetric information since it allows for the extraction of rent. It is possible to argue that with most of the regulated agencies still under public ownership managers have little incentive to withhold information since the possible benefits to the utility do not translate into personal benefits for managers. However the fact of withholding information is inherently a passive act and hence easier than the timely provisioning of quality information. Secondly, even public sector managers identify their interest with the firm’s interest when it comes to preserving the revenue stream of the utility with no incremental effort.

As significant a reason for the non-availability of adequate, timely and good quality information is the neglected state of the Accounting and Management Information Systems in general which do not permit the generation of such information. As a consequence, Commissions have regularly waived minimum information requirements as an interim measure pending reorganization within utilities. However the ability to control information flow and to game is a crucial element in affecting regulatory outcomes. Regulatory outcomes can be guided in the desired direction by selective disclosures. Alternatively flooding Commissions with more information than they can absorb can also effectively kill careful


16 Except in case of the four distribution companies in Orissa.
analysis of inconvenient facts. Sometimes, when a specific item of information is requested and it is difficult or impossible to delay in providing it, the best tactic is to bury it in a mountain of irrelevant information. There is some truth also in the argument that Commissions may have over specified minimum information requirements far beyond their current capacity for useful analysis. The establishment of a useful data bank, over time, is likely to require refinement of information requirements on the basis of experience. Simultaneously, utilities need to gear up their capacity to collect, collate and provide useful information. The case of NTPC in the Availability Tariff hearings in the CERC illustrates that utilities do not necessarily gain by under providing information. Since the utility was unable to provide detailed data on Station Wise Availability the CERC was forced to work with the inadequate data it was given. The end result has been that NTPC considers the targets for Availability determined by the Commission to be unrealistically high.

**Implementation of regulatory orders and decisions**

The inadequate capacity of Commissions to implement their decisions is clearly an area of concern. The incapacity of the OERC in inducing rapid improvements in efficiency despite performance linked incentives embedded in the tariff. The travails of the CERC vis a vis POWERGRID and NTPC are all examples of regulators not being able to exercise the considerable formal power available to them under the Act to enforce compliance. Regulatory neglect, which we define as the ability of the utilities to ignore the directives of regulatory bodies without penalty is an observable and retrogressive trend. For example, no action has been initiated till date (October 10, 2000) by the Uttar Pradesh Power Corporation Limited on the direction of the UPERC to approach the Central Electricity Regulatory Commission, within one month of the tariff award issued on July 27, 2000, for determination of tariff for Tanda thermal power plant owned by the National Thermal Power Corporation. Internationally, such negligence of not even requesting the Commission for more time would have drawn a heavy penalty as it is a common practice to impose hefty fines on brigand utilities. We cite here the example of the fine of USD 1.7 million which may

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18 Section 44 of the ERC Act 1998 empowers the regulators to punish the non-compliance with three months imprisonment or with a fine, which may extend to Rs 100,000, or both. Further, an additional fine of Rs. 4000 per day may be imposed for continuing offence.

19 Information gathered in telephonic discussion with Mr. J L Bajaj, Chairman UPERC, on September 29, 2000. Further confirmed that no such petition has been filed in a telephonic discussion on September 29, 2000, with Mr. D K Joshi, Deputy Chief (Economics), CERC. In Andhra Pradesh the situation is better with the Commission being more or less satisfied with the steps initiated by the utility. Except on one aspect relating to interest expenditure where the commission had requested for more details, the utility appeared to have more or less satisfied the regulator. Information gathered in telephonic conversation with Mr. N Rao, Secretary, APERC on September 29, 2000. In Maharashtra the commission does not appears to have reviewed the situation because of the appeal for review of the tariff award. Information gathered in telephonic conversation with Mr. Sathpathy, OSD, MERC on September 29, 2000.
be imposed by National Electricity Agency (ANEEL) on Brazilian electric utility FURNAS\textsuperscript{20}. The fine would be imposed due to the failure to sign new contracts to buy and sell power as part of an overall regulatory reform within the electricity sector. The utility has already been fined USD 0.9 million for its role in a blackout in March 1999 which left more than half the nation without power for several hours. In the public sector entities, especially in the Indian context where the utilities continue to be in financial loss a penalty may be just another loss without actually making any substantial difference. However, representative penalties may still make some sense from the perspective of sending correct regulatory signals on non-compliance especially for the future.

In summary, the process of independent regulation appears to have vindicated the objectives with which it was installed. The level of transparency has increased with a corresponding increase in the level of participation by stakeholders. Decisions are more inclusive today than they were under the process of administrative decision making. The process is yet far from efficient. Information asymmetries and varying levels of competence across stakeholders restrict the equity and efficiency of the process. Impatience with tardy decision making in the past has imposed impossible time limits on Commissions. Inadequate staffing and analytic capability compounds the fact the information is scarce and of doubtful quality. However these are problems of transition not of direction. The underlying trends in independent regulation are positive. Regulatory Commissions and utilities are starting from fairly low levels of information infrastructure, human resources and managerial incentives. They can only improve.

**Principles of tariff determination**

Economic regulation is a substitute for the market in situations where the natural monopoly characteristic of industries, as in the case of network utilities, justify such interventions. Regulators are expected to exert pressure on the utility to improve its working to a level at which it would have performed in a competitive market. This model assumes the ability of the regulators to mimic market conditions. Even the partial achievement of such conditions, as demonstrated by experience in U.K, requires substantial effort by the regulatory authorities towards articulating a long-term agenda, defining targets and milestones and designing and implementing the strategy. Where a clear mandate to restructure the market is not available, as in India, pricing strategy is the principal tool available to simulate those conditions.

To achieve the objective of sharing their vision of the electricity sector and specifically of the tariff structures to be adopted to achieve the ends of competition, economy, and efficiency, several Commissions have prepared and issued consultation papers on Tariff Principals and

\textsuperscript{20}“Brazil's FURNAS is fined for March 1999 blackout and may be fined for failing to sign contract.” February 2000. Global Energy Regulation. NERA.
The papers differ in their style and content however there are significant areas of agreement and not surprisingly a shared vision for tariff setting in general. Six common themes emerge.

- Clearly the task of balancing the budget of utilities is uppermost. Commissions have emphasized the need for financial viability as a precondition for sustainable growth. This concern is however less significant in the paper produced by CERC, possibly reflecting the satisfactory financial condition of the central government generators and the transmission company. In the case of the state level regulatory commissions however, this concern often overshadows efficiency concerns. The Delhi paper assumes that the utility has no control over power purchase or fuel costs and hence recommends a pass through of such costs. Clearly, this approach is contrary to the need for efficiency improvements and better risk management in the bulk power market. However, a positive aspect of the general concern with financial viability is the consensus view of the need for review of the rate allowed to utilities and the limitations of the existing formulation within schedule VI, which inadequately reflects the business risk and is therefore an inefficient incentive for optimum investments.

- Second, the method to be followed for determination of the Revenue Requirement of the utilities has also drawn considerable interest. The consensus is that for the present the existing Rate of Return method bolstered by elements of Performance Based Ratemaking is the only feasible solution. A gradual movement towards PBR is however indicated by the UP commission.

- Third, the method for allocation of costs to customer classes has drawn attention especially in the context of "social rate setting" or subsidization. The approach here is ambivalent. While there is recognition that subsidy must come explicitly from the government, there is a lack of clarity about the consequences of this not occurring. Should consumers be charged what it costs to supply? What are the efficiency limits of cross subsidization? Is all cross subsidization bad and unsustainable? The AP paper discusses the concept of "capacity to pay". Is this a practical pricing criterion?

- Fourth, the Commissions have focussed on tariff design. Should costs and hence charges be unbundled to reflect the cost of different services subsumed under retail supply? Should Time of Use tariffs be introduced? Can tariffs vary with varying cost of distribution? There is consensus that unbundling is required for restructuring of the sector and the introduction of competition. The limitations are inadequate metering and poor information on consumer profiles. These concerns restrict the development of TOU pricing also which is recognized as being efficient and desirable form the view point of demand management.

Fifth, the need for tariff reform to be accompanied by managerial efficiencies in the utilities and a lowering of the cost of supply is a predominant common concern. The emphasis on improving system losses in the AP, UP and Delhi papers and the emphasis on improving the Plant Load Factor in the UP paper point in this direction. Also significant is the universal demand that governments clarify their social objectives and support such objectives financially through budgetary allocations. It is significant that no paper has expressed a need for government to distance itself from the process of tariff determination. The demand is for direct, though transparent involvement of the government in the process as a stakeholder.

Six, there is only tacit and indirect recognition that competitive markets provide economically efficient outcomes. The emphasis is very much on improving the "competitiveness" of the utility rather than implementing a time bound plan for the introduction of competition. It is likely therefore that the advantages of competition, which are now well tabulated worldwide will not immediately, be realized in India.

How effective has the process of issuing consultation papers been? Clearly the preparation of a technical paper itself has value in terms of the skill addition and development of a consensual view within the Commission and the dissemination of such learning to other stakeholders. This has been a significant and positive consequence of these papers. Consultation papers should ideally force Commissions to share their views and their vision with the public. This has not occurred very extensively. By and large Commissions have desisted from expressing conclusions and have confined themselves to listing options. Stakeholders can however discern implicit preferences for a certain option. The process has also been hindered by the fact that, barring Orissa, none of the other Commissions have followed up the consultation paper with a definitive paper on tariff incorporating and dealing with the comments received. One notable lacunae has been the failure of Commissions to acknowledge work done by other Commissions. Though these papers are very similar and have been issued over the period 1997 to 2000, none has acknowledged the work done by previous papers. The tendency is to treat every situation as being unique requiring unique solutions. An opportunity has thus been lost to establish consistency in regulatory approach. There is need for a public recognition that Commissions intend to coordinate efforts and processes.
Link between restructuring and tariff reform

We also note here that while electricity industry continues to be regulated almost universally, mainly on the premise of natural monopoly\(^{22}\), major steps have been initiated to restructure the industry. These include California, which recently was at the centre of controversy due to spiraling electricity prices attributed to the pace of restructuring of the industry. It is instructive to present the case of corporatization in New Zealand where the transformation of the New Zealand Electricity Department (also Electricity Division for few years) into the Electricity Corporation of New Zealand (ECNZ), a state owned enterprise, created pressures to operate as a commercial organization\(^{23}\).

Box-1: Corporatization in New Zealand

<table>
<thead>
<tr>
<th>The corporatisation has resulted in reducing the organizational slack that in the generation and transmission sectors was estimated to be almost 3 percent of the wholesale prices. It is reported that since corporatisation, there has been considerable progress in reducing costs, particularly by reducing staff numbers, automating, contracting out competitively, and negotiating new fuel contracts over a period of five years (1987-92). The main results are summarized below.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Wholesale prices have reduced by 8% in real terms.</td>
</tr>
<tr>
<td>b) Unit operating costs (excluding fuel and capital related costs) have been reduced by 13% in real terms.</td>
</tr>
<tr>
<td>c) Sales volumes have increased by 2.6% per annum (in an essentially static economy).</td>
</tr>
<tr>
<td>d) Profits have increased from USD 262 million to over USD 400 million.</td>
</tr>
<tr>
<td>e) Return on equity has increased from 4% to 12%.</td>
</tr>
<tr>
<td>f) Average plant availability increased from 73 to 91% for thermal, and from 87 to 95% for hydro.</td>
</tr>
<tr>
<td>g) The number of employees was reduced by about 47%.</td>
</tr>
<tr>
<td>h) Productivity as measured by GWh per employee almost doubled from 4.5 to 8.5 GWh per employee.</td>
</tr>
</tbody>
</table>

\(^{22}\) It is interesting to note that some economists and historians have taken violent exception to the concept of natural monopoly. Horace M Gray is one among these critics

"The public utility status was to be the haven of refuge for all aspiring monopolists who found it too difficult, too costly, or too precarious to secure and maintain monopoly by private action alone. Their future prosperity would be assured if they could induce government to grant them monopoly power and to protect them against interlopers.... The obvious conflict between the traditional ideology and the public utility concept was resolved by resort to rationalization. It was said that the enterprises supplying gas, electricity, street transportation, water, and telephonic conversation were 'inherently' or 'naturally' monopolistic; that they had certain 'natural characteristics' which distinguished them from other enterprises.... that because of this 'natural' force, they tended 'inevitably to become monopolies.... Thus, the fiction of 'natural monopoly' was invented to explain the centripetal tendencies then observable...."


Recent technological trends imply a dramatic change of the network economics, leading to possibilities of inter- and intra-network competition, as well as inter fuel competition..... In general, the natural monopoly character of the electricity network is endangered by three major developments: decentral power generation, the evolution of parallel lines and controlled electricity transport and distribution.

Table-3 below provides an indication of the approach adopted by the Commissions in the context of attempting to introduce privatization and competition. However, we do not find any concrete timetable and plan for privatization or introduction of private capital. This is not surprising considering that most of the Commissions are not really authorized to deal with issues of restructuring, which continues to be managed within government.

Table-3\textsuperscript{24}. Approach adopted on restructuring and privatization*

<table>
<thead>
<tr>
<th></th>
<th>A.P.</th>
<th>Gujarat</th>
<th>Maharashtra</th>
<th>U.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restructuring and competition</td>
<td>Noted that the competitive markets lead to economically efficient outcomes and that the goal of the commission was to replicate the competitive environment.</td>
<td>Recommended to the Government of Gujarat that separation of generation, transmission and distribution should be seriously considered</td>
<td>No mention</td>
<td>Noted that competition and privatization were desirable objectives and that the public monopolies have led to inefficiencies</td>
</tr>
<tr>
<td>Introduction of private sector</td>
<td>Not mentioned</td>
<td>Not mentioned</td>
<td>Not mentioned</td>
<td>Same as above</td>
</tr>
<tr>
<td>Approach on captive power plants**</td>
<td>Not mentioned but has issued a separate paper</td>
<td>Not mentioned</td>
<td>Noted that captive power needs to be encouraged, particularly through cogeneration</td>
<td>Not mentioned but has issued a separate paper</td>
</tr>
</tbody>
</table>

*The restructuring of the sector and privatization of distribution has already been achieved in Orissa.

**The approach on captive power plants can be considered as proxy measure to introduce competition in bulk supply markets

\textsuperscript{24} Tariff orders as below:

Implementation of tariff strategy

Translation of the tariff concepts elucidated in the consultation papers into strategy has been a complex and challenging job for the regulators because of a number of reasons. Firstly, the extent of under realization of cost on the average requires an average increase of between 30 to 50 percent for the utility to break even at current efficiency levels. Secondly, the impact of this increase has to be borne by those politically sensitive customer classes, like agriculture and domestic, which have been traditionally subsidized. There is little scope for continuing to bleed the industrial sector and large consumers. The tariffs for industry and large consumers have increased over the years far beyond the cost of supply. In most cases, the tariff even exceeds the cost of self-generation and thus provides a perverse incentive for large consumers to abandon grid supply. More significantly, with the overall demand supply imbalance the quality of supply has steadily deteriorated. Voltage and frequency fluctuations are at an extreme level and cause significant though hitherto unquantified loss. Price is a ratio, with money in the numerator and some physical of given or assumed quantity and quality in the denominator and thus price regulation alone is economically meaningless unless indexed to quality. Providing the tariff increase required to balance the budgets of utilities has the nasty implication of taking vested political interests head on. It also is difficult to consider because of the sudden burden it would impose on small consumers. Sharp fluctuations in prices are detrimental to commercial functioning. They can result in deviant consumer behaviour and increase the level of theft. Sharp price hikes can also damage the public credibility of reform in terms of their consumer welfare enhancing impact. Lastly, because of the limitations on the government finances most Commissions can not hope to factor in budgetary support for utilities even as a transition measure.

Despite these limitations it is encouraging that there is a definite move towards aligning the agricultural tariff, which traditionally has been the most politicized constituency, with the cost of supply. The average realization from the agricultural consumers in FY 1999-00 was 24.86 paise per kWh as compared to the average cost of supply of 280.88 paise per kWh. It is commonly asserted that such comparisons are not relevant since current realization is an inaccurate estimate and is artificially deflated by the inclusion of theft and other transmission losses, which are not attributable to agriculture. The realization figures may turn out to be higher when corrected for the consumption figures, which are distorted to conceal the high transmission and distribution losses. Secondly, it is also often said that average cost is not a meaningful comparator since agricultural consumers are supplied only during the night hours and hence should pay only the SRMC or the variable cost of supply. Despite the validity of both arguments, the situation remains that the average realization is still far below


even the SRMC which, back of the envelope calculation show, is 185 paise per kWh. Hence the move towards bringing agricultural tariffs to costs is welcome. Table-4 below presents the extent of average increase in agricultural tariff in sample states.

Table-4: Increase in agricultural tariff

<table>
<thead>
<tr>
<th>State</th>
<th>Date of last tariff revision</th>
<th>Date of new tariff order</th>
<th>Nominal Increase in 2000 tariff order</th>
<th>Average increase per year since last revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>January 1, 1999</td>
<td>May 2000</td>
<td>61 %</td>
<td>43.1 %</td>
</tr>
<tr>
<td>Gujarat</td>
<td>June 1, 1993&lt;sup&gt;29&lt;/sup&gt;</td>
<td>October 2000</td>
<td>330 %</td>
<td>44.5 %</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>September 1, 1998</td>
<td>May 2000</td>
<td>105 %</td>
<td>60.0 %</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>January 25, 1999</td>
<td>July 2000</td>
<td>40 %</td>
<td>26.7 %</td>
</tr>
</tbody>
</table>

While the increase in some of the cases, for example in Gujarat and Maharashtra, may look exorbitant, it has to be viewed in a proper perspective of irrationally low existing tariff structure. In Gujarat, for example, the tariff was actually revised downwards in June 1997 and consumers on an average were paying approximately 20 paise per kWh in 1999/00 as compared to 58 paise per kWh in 1986/87. With the revised tariff it is expected that the consumers will pay approximately 98 paise per kWh in 2000/01 as compared to 58 paise in 1986/87, translating into an average increase of less than 4 percent per annum as compared to an increase of 7 percent per annum in the whole sale price index. There has also been substantial increase in the minimum support prices for agricultural commodities during this period. Hence the rationalization of agricultural tariff is a reasonable step and can initiate several benefits, which become viable at higher tariff levels like energy conservation through improvements in the efficiency of water pumps along with water conservation measures.

<sup>27</sup> The average cost of fuel used in FY 1999-00 was 107.9 paise per kWh, consisting of 102.6 paise per kWh of coal cost and 5.3 paise per kWh of oil cost. Adjusting this by an average loss of 21 percent and adding the O&M cost of 10.6 paise per kWh and establishment and administration cost of 37.7 paise per kWh, the total variable cost works out to 184.9 paise per kWh. All data from Planning Commission. April 2000. *Annual Report on the Working of SEBs &EDs*, Government of India.


<sup>29</sup> Downward revision in June 1997 has been ignored.
**Tariff design**

Efficient tariff design has played a significant role in assisting the process of tariff rationalization. Gujarat has accompanied the stiff tariff increase with an innovative tariff design which incentivises agricultural consumers, to install meters, through a preferential rate for metered supply as compared to unmetered supply. This was done by designing the flat HP based tariff in a manner that it translates into a higher per kWh charge as compared to the metered tariff. Commissions have also simplified the tariff structure, which over the years had becoming increasingly complex with multiple customer classes and slabs. The effort has been to merge the number of customer classes toward the goal of a single tariff for each voltage of supply differentiated principally by the time of supply and if justified on commercial grounds by the density and location of supply. Accordingly the number customer classes and the consumption slabs within each customer class have been rationalized and reduced. Further steps in this direction included merger of a number of additional/surcharges into demand or energy charge appropriately. Fuel surcharge, which used to be an issue of much controversy has also been merged with the energy charge in most of the cases. Table-5 below provides the details regarding rationalization of consumer categories.

**Table-5: Rationalization of tariff structure**

<table>
<thead>
<tr>
<th>Number of tariff categories</th>
<th>Before</th>
<th>After</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maharashtra</td>
<td>8</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Orissa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRIDCO</td>
<td>Not relevant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISTCO’S</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Gujarat</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td><strong>HT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maharashtra</td>
<td>15</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Orissa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRIDCO</td>
<td>Not relevant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISTCO’S</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Gujarat</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

The level of tariff simplification, which has already occurred, is minimal and considerable scope exists for further rationalization. Commissions have been constrained in this effort by

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30 Tariff orders as at footnote 24
two main factors. Firstly the inadequacy of disaggregated billing data makes customer class wise consumption patterns difficult to assess. Hence rearranging classes and tariff slabs imposes revenue risk for the utility, which is difficult to quantify. Secondly tariff simplification tends to increase the burden of adjustment for currently subsidized customers. With the need to fill the revenue gap already exerting stress on currently subsidized customers, Commissions have been rightly cautious in aggravating this problem. Clearly however this is an area where extensive work still remains to be done.

Unbundling retail tariffs by allocating costs to the components of energy service is another exercise which remains relatively unexplored. Customers need to be charged separately for the following services:

1. Bulk power purchase
2. Transmission system costs including transmission loss.
3. Distribution system cost including distribution loss.
4. Retail supply cost including metering, billing, collection and customer servicing.

Under each of the four major cost heads costs can be further sub-classified as fixed or variable and charged for accordingly. Data for cost involved with providing above services for a representative state is presented in Table-6 below.

Table-6: Cost of providing different services (Rs./kWh)

<table>
<thead>
<tr>
<th>Head</th>
<th>Bulk power</th>
<th>Transmission system cost</th>
<th>Distribution and retail supply costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.08</td>
<td>0.35</td>
<td>0.97</td>
</tr>
<tr>
<td>Fixed</td>
<td>0.68 (33%)</td>
<td>0.24 (69%)</td>
<td>0.62 (64%)</td>
</tr>
<tr>
<td>Variable</td>
<td>1.40 (67%)</td>
<td>0.11 (31%)</td>
<td>0.35 (36%)</td>
</tr>
</tbody>
</table>

In comparison most retail tariffs today are single part and do not distinguish between the four separate components of retail supply. Charging these separately has two advantages. First, it forces utilities to account for these costs separately which builds the data base needed in future for unbundling these services. Unbundling is necessary not only to optimize allowable cost through benchmarking under PBR or COS but also is a pre condition for moving to retail choice. Second, unbundling costs focuses the attention of stakeholders on those costs, which they can control. Generally customers have no control over the fixed costs of the utility. They can avoid or reduce only the variable costs. From the regulators perspective, fixed costs are inert costs which can be changed only once at the time that they are incurred and hence can be ignored beyond that stage. What is more vital from the viewpoint of bringing about short run efficiencies are the variable costs which are changeable and hence controllable.

Commissions have devoted considerable effort to redesigning tariff charges. This aspect relates to the allocative efficiency, to which little attention was paid in the past. Allocative efficiency requires the goods to be distributed in a manner that they are received by those
who obtain maximum benefit from them, and this can be achieved by relating the prices to the marginal cost. However, the price setting has in the past took no cognizance of the economic theory and the prices have over the years evolved so as to include a heavy dose of cross-subsidy. This has resulted in industrial consumers moving off the grid to self-generation.

The Commissions attempted to correct the historical distortion in the recent set of tariff orders. It was however possible to pay more attention to this aspect as has been paid to the productive efficiency, which requires that electricity is produced at the minimum possible cost. That by limiting the rate of return in itself does not result in efficient allocation is a point brought out very clearly by Shepherd and Gies. The microeconomic theory in contrast to looking at the overall return is interested first and foremost in the determination of individual prices. The optimum amount of total revenues is conceived to be the result of the process that operates in individual markets in fixing prices of individual prices. And as far as question of determination of individual prices is considered, the principle of microeconomics is very clear: prices should be equated to the marginal cost. We however find insufficient recognition of the concept and its application. The regulatory commissions need to be guarded of the tendency, which is evident in US also, where the regulators have been criticized for applying basis other than economic efficiency. Similarly, while some steps towards time of day tariff, reducing the mismatch between fixed liabilities and revenue from demand charges etc. are evident, it was perhaps possible to achieve more. Table-7 below provides a comparative position on steps towards allocative efficiency.

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31 So whatever the rates of return may actually have been, they cannot by themselves demonstrate whether resource allocation (in and within the utilities) has been efficient. William G Shepherd and Thomas G Gies. 1966. Utility Regulation: New Directions in Theory and Policy. Random House, New York.

### Table-7: Allocative efficiency in tariff setting

<table>
<thead>
<tr>
<th>Application of marginal cost</th>
<th>A.P.</th>
<th>Gujarat</th>
<th>Maharashtra</th>
<th>Orissa</th>
<th>U.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No mention</td>
<td>No Mention</td>
<td>No Mention</td>
<td>The Commission has moved away from application of marginal cost because of lacunae in database and executing machinery</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The Commission has examined the possibility of application of marginal cost through aligning the energy charges with SRMC</td>
<td></td>
</tr>
<tr>
<td>Time of day tariff</td>
<td>Not applied</td>
<td>Applicable in the existing tariff structure. The Commission has provided further incentive by substantially increasing the night time concession</td>
<td>Introduced for HT industrial consumers. Also noted that it is a critical tool for Demand Side Management</td>
<td>Not applied</td>
<td>A surcharge exists for HT category but it is more in form of a charge for making energy available during restricted hours</td>
</tr>
<tr>
<td>Reduction of mismatch between fixed liabilities and demand charges</td>
<td>Little progress. No demand charge for domestic or commercial consumers</td>
<td>Noted that it would be practicable to link demand charges with corresponding fixed cost incurred</td>
<td>Observed that it is a desirable objective</td>
<td>No further movement after the second tariff order in 1998.</td>
<td>Some progress. Two part tariff introduced for all categories except unmetered category</td>
</tr>
</tbody>
</table>

33 Tariff orders as at footnote 24
Methods of tariff determination

Cost of service approach

Commissions continue to be strongly influenced by the provisions of Schedule VI of the E(S) Act. This is not surprising considering that the ERC Act and all the state Acts require them to do so and depart from it only for reasons to be recorded in the interests of economy and efficiency. Accordingly, the primary focus of the Commissions so far has been to scrutinize the expenditures and to pare them down to more efficient levels. The revenue requirements were thus reduced, sometimes dramatically on the basis of what was considered reasonable. The Orissa case is a good example. The OERC in its first Tariff order for 1997/98 focussed on the high T&D loss of the utility; GRIDCO. Against an estimated loss of 46.6 percent in the previous year (subsequently said to be under stated) the OERC allowed a T&D loss of only 35 percent. The OERC disallowed 22 percent of the costs projected by the utility on the grounds of high T&D loss and other inefficiencies. In the subsequent year disallowed costs dipped marginally to 18 before increasing to 22 percent in 1999/2000. The MERC, APERC and UPERC have respectively disallowed 9 percent, 7 percent and 14 percent of the projected costs of the utilities.\textsuperscript{34} There is some truth in the argument that faced with significant deficits not only in the Test Year but also in the projected period in all utilities, as per Table 8 below, regulators have concentrated primarily on somehow balancing the revenue requirement of the utility with the potential revenue.

Table-8\textsuperscript{35}. Revenue deficit (Rs. Crores)

<table>
<thead>
<tr>
<th>State</th>
<th>Estimated deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharashtra</td>
<td>2434</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2917</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>2404</td>
</tr>
<tr>
<td>Orissa</td>
<td></td>
</tr>
<tr>
<td>GRIDCO</td>
<td>488</td>
</tr>
<tr>
<td>DISTCO'S</td>
<td>493</td>
</tr>
<tr>
<td>Gujarat</td>
<td>1145</td>
</tr>
</tbody>
</table>

They have also generally assumed a glass ceiling on potential revenue on the basis of a maximum assumed increase in the tariffs of different consumer classes. This ceiling can vary depending on the base level of subsidisation or taxation for that consumer class, its assumed capacity to pay, its share in total consumption and its political clout.

In this process of balancing future estimated revenues with costs, regulators are focussing on the “reasonableness” of estimated costs. Industry best practice standards are being used to benchmark the allowable costs for utilities. While application of best practice standards is a legitimate objective even under the cost of service (COS) approach of Schedule VI, the

\textsuperscript{34} Ahluwalia Sanjeev.S. “Power Tariff Reform in India” Economic and Political Weekly, Vol XXXV No 38, September 16-22.

\textsuperscript{35} Tariff orders as at footnote 24
only issue is that benchmarks have to be achievable and the time frame for achievement, realistic. The problem with the COS approach is that it does not allow for the formal institution of performance benchmarks well in advance. Costs are allowed or disallowed arbitrarily as a part of tariff reviews. There are no definite price signals in advance, which the utility can react to beyond the general one that costs have to be reduced. More importantly, there is no incentive to reduce costs in advance of the regulator doing so. The utility is not rewarded for unilateral improvements in efficiency. Instead these can become the cause for further contraction of the allowable cost in the next review with the regulator gladly accepting costs where they are low but reducing them where they are high. With a more proactive style of tariff regulation since the onset of independent regulation and hence more frequent and more intensive reviews the perception of regulatory risk amongst utilities has increased.

The Cost of Service approach failed in the pre 1996 period to ensure the financial viability of utilities. This failure was ascribed to the method of its application and political intervention rather than any inherent flaw in its structure. Its use by independent regulators has not changed matters significantly. Utilities continue to be suffering from significant imbalances in the revenue and costs. The Orissa case is a good example because it is the only example where independent regulation has been applied over a period of four years. During this period 1996 to 2000 the total accounts payable, which can be treated as a proxy for the loss, for all the five utilities put together increased from Rs 465.5 crores on April 1, 1996 to Rs 1160.4 crores on March 31, 2000. The alternative is to try the PBR approach or alternatively the Revenue/Price Cap approach.

Performance Based Ratemaking

The alternative to the cost-plus approach is the PBR (performance based ratemaking). The PBR approach, while recognizing the revenue requirement of the utility, provides incentives for improving efficiency and reducing costs. It weakens the link between the utility’s regulated prices and costs by decreasing the frequency of rate cases and/or by employing external measures of cost. The control aspects of regulation are thus sought to be replaced with a system of incentives and penalties through institution of industry wide norms. As a result, the PBR creates incentives, which are similar to those that would exist in a competitive market place. Such a system would reward efficient management while inefficient ones would sooner or later be thrown out. PBR also eliminates the tendency of utilities under the cost plus regulation to be more capital intensive, known as the Averch-Johnson effect, than they would be in competitive environment.

36 The OERC has reviewed the bulk and retail tariff three times since April 1997.

International experience in regulatory reform and implementation of PBR schemes suggest that significant efficiencies in investment are possible. Productivity in the UK electric power industry has increased from around GBP 40,000 per employee in 1980 to GBP 170,000 in 1998 in constant 1995 prices. In India also the adoption of the PBR approach has worked extremely well in the case of NTPC. In 1992, as a result of the work done by the K.P.Rao Committee, operational cost norms were specified by the Government of India under section 43 A (2) of the E(S) Act for National Thermal Power Corporation (NTPC). These norms specified the heat rate, auxiliary consumption rate and the schedule for recovery of the capacity charge comprising Rate of Return on equity and Operations and Maintenance expenses linked to achievement of the Plant Load Factor/Availability of the unit. Achievement in excess of the cost norms is retained by NTPC while all costs incurred above the cost norm are borne by NTPC. The norms were valid for five years. During this period, the NTPC’s profit before tax (PBT) grew by over 28 percent per annum from Rs 735 crores in FY 1991-92 to Rs. 4195 crores in FY 1998-99. Similarly the ratio of PBT to net assets grew from 6.1 percent to 26.4 percent. The norms are still to be revised by the Central Electricity Regulatory Commission, to whom the jurisdiction of regulating the tariff of central generators was transferred in May 1999.

There is also clear evidence of the fact that the Commissions are not only aware of the advantages of PBR over COS but are actively adopting it. The UP commission benchmarked the administrative and overhead costs of the utility to the national average as a target and on that basis reduced the allowable expenditure. It similarly compared the performance of the generation segment with the national performance benchmarks and found it severely lower. In Maharashtra, the Commission has required the utility to reduce the cost of power purchase using the merit order principle. In Orissa, the Commission has been innovative in linking efficiency gains beyond the target level prescribed by it to a corresponding increase in the return earned by the utility thus providing a powerful incentive for performance well in advance in the best traditions of PBR. These are stray instances however inadequate data, the lack of a historical perspective and relative unfamiliarity with PBR have restrained regulators from a more complete and formal adoption of PBR. In Maharashtra, for example, the Commission approved the Operation and Maintenance expenditure of Rs. 675 crores as requested by the MSEB. This translates into 16.22 paise per kWh as compared to the national average of 10.60 paise per kWh and 8.63 paise per kWh in Gujarat, which is a comparable utility. Requiring the MSEB to operate at the national average would have resulted in a saving of nearly Rs. 239 crores. This illustrates that the Commission has not rigorously adopted the principle of PBR. Had it done so, it would have needed to establish performance benchmarks for all major cost heads. In view of the relative inefficient levels of operations, it is conceivable that such benchmarks would need to be projected several years in advance so as to bring in efficiency improvements over time and give an opportunity to the utility to adjust to the new efficiency levels.


What are the advantages in formally adopting a PBR approach? First, since the PBR schemes generally have a longer duration, typically of up to five years, the regulatory risk emerging from reviews is reduced. In the Indian context, infrequent reviews with annual performance parameters announced in advance, eliminates the problem of political interference. Second, since performance parameters are determined on the basis of industry wide norms and not the costs and performance standards of any individual utility, the potential for realizing rent due to information asymmetry is reduced. Infrequent tariff reviews also free the government and the regulators to focus on other tasks including improving the quality of supply, enforcing tighter customer service standards, grievance handling and the sustainable development of the electric supply industry. These are important tasks, which are vital for the sustainable implementation of reforms. In the current context these get neglected since the entire attention gets focused on tariff determination which is an annual exercise. If tariff rationalization is to be delinked from reform, restructuring and privatisation, efficiency improvements and improvements in the quality if service provided to consumers are necessary. This becomes difficult when then the limited capacity of the Commissions is devoted extensively to tariff determination. Often regulators may need a longer time interval between rate reviews to develop the analytical capacity to prepare for the next review. Regulators may use such longer time interval to publish consultation papers and review the results of the associated hearings so that tariff reviews do not happen in a vacuum of uncertainty. The reduction of regulatory risk is an important precondition to privatisation. The adoption of PBR will assist in this process. PBR also provides advance signals which efficient utilities can use to optimize operations. The longer interval between tariff reviews also assists in preserving the benefits of efficiency enhancement within the company. Under COS, there is always a risk that the benefits of efficiency improvements will be passed through to consumers. Hence both PBR and the Revenue Cap/Price Cap approach are more conducive to efficiency enhancements than COS.

The design of a PBR plan involves an assessment of the behavioral pattern that is sought to be encouraged or discouraged as also the defining the allocation of risks between the customers and the investors. The objectives that the programme is supposed to achieve should be defined as clearly as possible at the outset. In India, the possible regulatory goals can be to provide powerful incentives for cost reduction, improving the quality of supply and service, to encourage efficiency in use and to promote use of renewable and alternative forms of electricity. It is often useful to do a comparison of the PBR scheme with the existing cost plus regulation and define how the PBR mechanisms would more effective in achieving the sought objectives.


The new power purchase rate, fixed by the UP power regulatory commission, has jeopardized the privatisation chances of the Kanpur Electricity Supply Company (KESCO). At Rs. 2.15 per unit power purchase rate, KESCO will be incurring a loss of Rs. 174.53 crore per annum.
The second important dimension of the PBR plan is its term. The firm, during the term of the plan has an opportunity to take advantages from the efficiency enhancement investments. The longer the term of the plan, the stronger the incentives for such investments. If the term is too short, utilities become subject to ratchet effect\(^{41}\), under which they will not even try to make a cost-effective investment because they may not recoup their productivity-improving investment and will have to try harder in the future just to break even\(^{42}\). It is interesting to note that the idea of long term plans actually traces its history to the regulatory lags under cost plus regulation. Vogelsang and Finsinger have demonstrated that basing a firm's allowable prices in one year on its cost in the previous year could provide the firm with the incentive to adopt a pattern of prices that converged to the efficient level\(^{43}\).

Regulatory commitment to the plan and selection of appropriate indices for benchmarking performance are also important criteria. The PBR plans also often include mechanisms for sharing earnings with the ratepayers. While the economic theory prescribes that the utility's best incentive to efficiency enhancing investments is to retain all of the incremental earnings, the regulatory commissions as well as a number of experts\(^{44}\) have argued and preferred sharing of above the benchmark earnings with the ratepayers. Allowance for unforeseen circumstances (commonly known as the Z factor), events or cost items which may outside the utility's management control, is another typical characteristic of the PBR plans. The important criteria for approving the Z factors should be a clear understanding of the risks that the regulator wants the utility to bear and these may or may not necessarily be items that are outside of their control. Thus, while the economic theory prescribes that the risks should be allocated in a manner that they are borne by those who are best placed to bear it and although certain risks may be beyond the management's control, they nevertheless fall right within the range of risks that businesses in competitive markets must bear and hence the management's should, therefore, be charged with managing the exposure to such risks through investment decisions and cost controls\(^{45}\). This argument provides an interesting twist to the inclusion or a promise for inclusion of fuel adjustment clause in most of the reform acts and subsequently the tariff awards. Since the fuel adjustment clause allows recovery of every additional rupee spent on the fuel, they provide

\(^{41}\) Laffont J J and Tirole J. 1994. *A Theory of Incentives in Procurement and Regulation*. Cambridge, Massachusetts: MIT Press. “The rent extraction concern gives rise to the celebrated ratchet effect. The regulator infers from a high performance an ability to repeat a similar performance in future and becomes more demanding. Consequently the firm has an incentive to keep a low profile”.


the utility with a zero cost insurance policy. They also create disincentives for investing in fuel efficient and renewable technologies as also for operating the units efficiently.

Further, there are certain pitfalls that the regulators need to guide against in designing the PBR schemes. Under the PBR scheme, the firm will have a tendency to increase the profits by reducing the quality of service and hence inclusion of penalty clauses on appropriate service quality parameters is desirable. In U K for example, the violation of service quality standards often results in payments directly to the affected customers thereby providing sufficient incentives for maintaining or infact improving the quality of service. It is thus incumbent on the regulatory commissions to keep a constant track on the service quality and devise penalty that is sufficiently high to retain the managerial attention. The PBR schemes are also associated with being non-equitable to the consumers. These concerns arise because of the above markets returned associated with PBR, fewer opportunities to air grievances/litigate against the tariff and because it leads towards Ramsey prices which are often perceived as unfair by the commissions. It is critical to ensure good quality database to implement successful PBR schemes and it should also be noted that PBR schemes also require significant regulatory input and oversight though the focus of attention is to ensure maintenance of quality rather than judging the prudence of expenditure.

The application of PBR to whole sale tariffs, particularly for central government owned generators, has been continuing for a decade now. The need of the hour is to formalize the demise of COS regulation and its replacement by a hybrid of PBR and Price Cap regulation. All ERC have already adopted an informal Price Cap regulation in the case of industrial tariff which have been increased only by the rate of inflation or less. This move should be formalized and extended to all customer classes which are currently “taxed”. These customers should know that over the next five to ten years their tariffs would decline in real terms. Instituting a RPI minus X type of formula applicable for atleast five years for these customers will induce certainty and allow such customers the freedom to plan ahead. Declining tariffs will also reduce the incentive for self generation and thus pull industrial customers back into the grid. Price Cap regulation can also be used to contain the tariff shock from the withdrawal of subsidy. Price Caps, possibly corresponding to the capacity of a consumer class to pay or the marginal value added by incremental use of electricity, should be notified as efficient limits for tariff increase over time. The notification of such caps will serve a dual purpose. First it will allow governments to justify the provision of subsidy for the customer class, where there is a danger of the cap being breached. It will also facilitate the budgeting of subsidy in a medium term perspective. Secondly, it will also guide the ERC in tariff setting. The uniform adoption of Price Cap regulation in a more general way will have to await stabilization of the system. Secondly, the usefulness of Price Caps to meet large increases in capacity is somewhat uncertain. The incremental capacity requirements of the system can best be met under PBR, which allows a somewhat higher level of collaboration between the ERC and the utility.

The adoption of PBR is a fitting replacement for the Cost of Service methodology of tariff setting. Its application, so far, has been sporadic, selective and inconsistent. The results have, not surprisingly, been lopsided. PBR has been applied to areas like T&D loss reduction, where the intention is to squeeze utility profits. However other areas, where operational costs have reduced, continue to be regulated under Cost of Service thus depriving the utility of efficiency enhancements in these areas. Regulatory Commissions need to formally adopt PBR through the notification of appropriate tariff regulations, which will establish the cost, and performance standards against which utility Revenue Requirements are to be tested. This is essential if the gains from efficiency enhancement are to accrue in a timely fashion during the process of transition. The transition to fiscal stability of the electric power system is a period of severe financial stress. Hence a combination of PBR and Price Cap regulation appears to meet the needs of the transition far better than the traditional Cost of Service Regulation. Its demise need cause us no discomfort.

Conclusions

Restoring the financial viability of utilities has been the focus of measures of tariff reform initiated in 1998 (1996 in Orissa) via the Electricity Regulatory Commissions Act 1998 and in the State Reform Acts. Including the central level, thirteen commissions are functional which cover over two thirds of the power supply. Of these, six, including the CERC, have issued tariff orders apart from initiating other regulatory proceedings. Other Commissions have not yet issued tariff orders though other proceedings have been held. The process adopted for the conduct of their proceedings has uniformly conformed to the judicial pattern thus ensuring transparency, fairness and equity. There have been some innovations like informal hearings and a proactive approach to siting the hearings by taking them close to the petitioners. In several cases, the strict rules of evidence have also been relaxed, keeping in view the expense involved in adhering to these rules and with a view to allow for wider participation. However no Commission has so far adopted the standard practice prevalent in the US and in the UK of exposing the mind of the Commission and seeking comments on the views of the Commission prior to finalizing the order. The restraint seems to be apprehensions that this will increase the time for disposal of petitions, that it may be unnecessarily dilatory and that it does not fit well with the exercise of judicial powers. Commissions have also been restrained in promoting the inclusiveness of hearings and actively encouraging participation by stakeholders and by the tight time schedules prescribed for decision making. In general however the process adopted under independent regulation has changed the scope and the range of participation by stakeholders in tariff determination. The process of tariff setting has become inclusive, the level of technical analysis has improved which has reflected positively on the quality of the decision making in this regard.

Commissions have a difficult task in implementing tariff reform. With extreme levels of tariff distortion, uncertain political support, withdrawal of subsidies by governments from hitherto beneficiary public utilities and the continuing uncertainty of industry restructuring, the
degrees of freedom available for Commissions to implement tariff reform strategies are
limited. It is praiseworthy that Commissions have responded with a blend of technical
sophistication and restraint in addressing this problem. Without formally departing from the
framework of cost of service tariff determination elements of the Performance Based
Ratemaking have been introduced thus bolstering administrative fiat with economic
incentives. The utility response to such economic incentives has not been assessed so far
except in the case of Orissa. In Orissa there is hope that the private owners who have now
been in operation for over an year now would respond more proactively to economic
incentives than the publicly owned utility did previously.

Tariff reform will work well where the government continues to support the process
financially. It will be more efficient where there is a private utility in place to respond to the
economic incentives devised by regulators. It will succeed where regulators resist the
temptation of revising tariffs frequently or in tightly controlling the utility's profits. Tariff reform
will be more efficient where regulators are assured functional independence, adequate
competent staff and facilities. The legislation has already provided the basis for successful
independent regulation and tariff reform. The key is in devising an implementation strategy
that ensures the continued active participation of all stakeholders. So long as public utilities
are service providers, a major part of the tariff reform effort lies with governments. Unless
public utility management is improved and the cost of supply aligned to efficient levels,
regulators will be constrained to continue to disallow costs, thus perpetuating the financial
crisis, which they were expected to reverse. Regulators can never be efficient managers.
They can only create the enabling environment within which efficient managers can function.
In the absence of such managers the efficacy of independent regulation is diluted. It is upto
governments to bring the process of industry restructuring to a logical conclusion by
privatizing utilities. The experience in Orissa, Maharashtra, AP, UP and Gujarat has shown
that poor management skills, inadequate managerial incentives, non responsive
management, lack of public accountability and the continued lack of autonomy in public
utilities are significant barriers to the financial viability of the electric supply industry in India.
These are challenges that independent regulation is not mandated to meet.