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The Delhi Electricity Discom Privatizations: Some Observations and Recommendations For Future Privatizations in India and Elsewhere

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Foreword

It is sometimes said that it is "darkest before the dawn." Certainly, most people would agree that the last several years have been a dark period for private investment in the power sectors of developing and transition economy countries. On a worldwide basis, private sector investment in the power sectors of these countries has declined from USD $44.1 billion in 1997 to $5.5 billion in 2002. In the same period, the news from the Indian power sector has also been disappointing. AES found it necessary to walk away from its distribution investment in Orissa, Enron's Dahbol project collapsed in controversy, and the movement to sustainable reform with benefits that are obvious to the general public has been painfully slow in many of the "Reforming States."

Against this backdrop of discouraging news, the July 2002 privatization of the distribution operations of the Delhi Vidyut Board, the state owned utility that served the 14 million people of metropolitan Delhi, may represent the dawn of a new era for India. The Government of New Delhi (Delhi Government) was able to sell majority stakes in three distribution utilities covering the entire metropolitan area even though the total operational and commercial losses were close to 50%.

How was the Delhi Government able to complete this transaction? Several key economic and regulatory factors are identified in this paper. These include:

- a willingness to set a clear subsidy system in place to support a transition path to full commercial activity;
- a willingness to establish companies with a sustainable level of liabilities even though this required leaving around 85% of the existing liabilities with a state-owned holding company; and
- the establishment of key elements of a multi-year tariff regime.

In addition, Delhi opted for the novel approach of requiring that the bidders bid on the basis of a trajectory of commercial and technical loss improvements for the first five years of private sector operation. This allowed bidders to demonstrate what they felt would be achievable while also providing consumers with a transparent measure by which the success of the privatization could be assessed. This is quite different from the standard bidding approach of requiring that private companies bid a price for an equity interest.

Some of the key lessons to be learned from the Delhi privatizations are that:

1. **Structure the transaction to appeal to a range of investors.** In this case the key bidding companies were local ones, not the large international players that had been relied on traditionally. This transaction helps confirm the growing evidence that local and regional companies may be able to assume a larger role in power sector privatizations at least in some countries. And if this is possible in a

country, it is important that the transaction is structured in a way that does not inhibit the participation of these alternative operators.

2. **Investors need certainty.** By setting the loss improvement trajectory for the next five years the bidders were provided with some certainty as to how the most important cost element of retail tariffs would be treated. This was further supported by the design of the subsidy scheme. Almost every country that has privatized distribution in recent years has provided a relatively comprehensive multi-year tariff setting system as part of the privatization package. Typically, these tariff setting systems pre-specify performance targets and periodic cost adjustment mechanisms for almost all major cost or performance elements. While Delhi has certainly taken a major step in this direction, the proposal made by the Andhra Pradesh Electricity Regulatory Commission would come even closer to what has become the *de facto* international tariff setting norm. Another commonly observed strategy used in other countries is that the government (as opposed to the regulator) will specify, on a one time basis in the privatization agreement, the tariff setting system that will apply to the initial post-privatization period. This would be more difficult to do in India since the state regulatory commissions are already in existence prior to privatization. However, once again, it appears that the Delhi government took a major step in this direction when it specified elements of the tariff setting regime in its pre-privatization policy directives and these elements were then adopted by the Delhi regulatory commission.

3. **Political will is important.** Difficult issues had to be addressed quickly and decisively. This happened because the Delhi Government was committed to the privatization since it had concluded that the *status quo* was untenable. It established a privatization process where decisions could be made quickly. As a consequence, it escaped the counter-productive gap between rhetoric and implementation that sometimes exists elsewhere.

We recognize, of course, that it would be premature to declare success for the Delhi privatizations just 16 months after the event. As we have seen in other countries, privatizations that are announced with considerable fanfare can sometimes quickly collapse in ways that are difficult to anticipate. Much will depend on the ability of the new owners to improve the quality of service, both technical and commercial, in ways that are readily obvious to their customers. Without such improvements, the foundation of public support will quickly collapse. Also, the uncertainties or misunderstandings surrounding the tariff system need to be resolved quickly.

Despite these concerns, it is our view that the creation of three new private discoms out of DVB represents an impressive accomplishment for both Delhi and India. We commend the Government of India and the New Delhi Government for focusing on distribution reform. This represents a significant policy shift. The initial focus of power sector reform in India was largely limited to buying power from private independent power producers through long term contracts. In a sense, this earlier approach was

equivalent to trying to build a house by starting with the roof. We think that the need for commercially viable distribution entities is a very promising development because distribution is clearly the critical foundation of the sector. Without distribution reform, nothing else will succeed.

We believe that this paper by Manish Agarwal, Ian Alexander and Bernard Tenenbaum and a forthcoming paper by Mr. Jagdish Sagar, the last Chairman of DVB, will shed considerable light on how to build a sustainable urban electricity distribution sector in India and elsewhere. We would like to commend all the authors for their work in drawing together this material and presenting insights and lessons in such a readable format. We are certain that the paper will be of genuine interest to power sector and government officials in many countries.

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The Delhi Electricity Discom Privatizations: Some Observations and Recommendations For Future Privatizations in India and Elsewhere

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"We never had any illusions that the whole world was dying to come and distribute power in Delhi."

Jagdish Sagar, former chairman of DVB
Power Line, June 2002, p. 12

In recent years, the focus of power sector reform in India has shifted from purchases of power from independent power producers (IPPs) to privatization of distribution. This shift reflects a recognition that the foundation for any sustainable power sector reform must be financially and operationally viable distribution entities. Or as one Indian power sector official observed, "If distribution doesn't work, nothing else will work." This paper takes a close look at the July 2002 privatization of the electricity distribution system in Delhi. *The paper's emphasis is on the process of privatization and how this is affected by the accompanying regulatory system.*[1] It describes key features of the Delhi privatizations and contrasts the Delhi privatizations with the 1999 Orissa privatizations – India's only prior example of state-wide electricity distribution privatization.[2]

It is our view that the design of the Delhi privatizations clearly improved on the Orissa privatizations in several key dimensions. However, we think further improvements are possible. Therefore, the paper makes eleven recommendations for the design and implementation of future privatization transactions and the accompanying regulatory systems that could be used in India and elsewhere. We believe that all these recommendations are compatible with the letter and spirit of India's recently enacted Electricity Act (2003). While the Delhi design clearly improves on the Orissa design, this, in itself, is no guarantee that the Delhi privatization will ultimately be successful, either from an investor or consumer perspective. The success or failure of the Delhi privatization will depend on how the design is implemented by the key players—the government, the regulator and the companies.

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[1] No attempt is made in this paper to assess the post-privatization technical or commercial performance of the new distribution companies. We recommend that this be the subject of a further study.

[2] Though one of the authors was directly involved in the Delhi privatization through advisory services that he provided to BSES, one of the successful bidders, this report is based solely on publicly available information. The analysis and recommendations represent the personal views of the authors. The report does not represent the views of KPMG, the World Bank or any clients of either organization. Comments were received from Clive Harris, John Besant-Jones and Alan Townsend (The World Bank) and Jagdish Sagar and Anil Sardana from India. All remaining errors are the responsibility of the authors.

Background: The Delhi Transaction

On July 1, 2002, the Government of the National Capital Territory of Delhi [Delhi Government] privatized the distribution portion of Delhi Vidyut Board (DVB), a vertically integrated state owned power enterprise, through the sale of 51% of the equity in three distribution companies. The three distribution companies created at the time of privatization were sold to two privately-owned Indian power companies, BSES and Tata Power. BSES bought two companies covering the central and east zones and the south and west zones and Tata Power purchased one company covering the north and northwest zones. [3]

Several key aspects of the transaction are described in this section of the paper. The following section then analyzes the decisions taken and our recommendations for improvements in future privatizations. Prior to addressing these elements of the transaction it is useful to have a flavor of the businesses being sold.

- At the time of privatization, DVB had about 2.5 million customers with a connected load of about 5,600 MW, energy sales of about 8,000 Gwh and an annual revenue of about Rs 3,000 crores (US $630 million).[4] For 1999-00, the average annual per capita sales in Delhi was 653 kWhs which compares to an all-India average of 355 kWhs.[5]

- In undertaking this privatization a key aspect of the success was the support provided by the Government.[6] This was manifested in various ways, all described later in this paper:
  a. clear policy guidelines to DERC;
  b. commitment to support the new private discoms during a five year transition period with subsidized prices for power purchases and deferred payments on loans; and
  c. a willingness to negotiate with potential operators when non-compliant bids were received.

Starting Conditions for the Companies

The general situation of the companies being privatized can be summarized as follows:

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[3] In India distribution zones are referred to as "circles."

[4] These numbers are based on billed amounts. Since under billing is a widespread phenomenon, actual consumption is probably significantly higher. At the time of this writing, a rupee is equal to US 2.1 cents. One crore equals 10 million rupees or about USD $210,000.

[5] These numbers are from the Government of India's Planning Commission. DVB estimated that actual per capita consumption in Delhi was about 1255 kWhs or about two times larger than the per capita sales number. The consumption number is larger than the sales number because a significant portion of what is consumed represents stolen electricity.

[6] A separate paper on the political economy of the Delhi transaction is being prepared by Jagdish Sagar, a key member of the Delhi government's privatization team. .

- **Revenue-cost gap.** There were serious cash losses in the system that were being funded through loans from the Delhi government to DVB. Since the inefficiencies could not to be eliminated overnight, no private investor would be willing to take over the system unless the Delhi government would agree to provide direct or indirect subsidies for several years.

- **Condition of physical system.** The physical distribution system was in poor shape. It needed significant, but difficult to estimate, capital investments. The Delhi government estimated that capital investments of approximately Rs. 1,021 crores (USD $ 214 million) would have to be undertaken in the first five years after privatization.

- **Poor data.** Record keeping at DVB for billing, metering, finance and assets was very poor. [7] Private investors expect detailed information for their "due diligence" review and are wary of taking risks associated with data uncertainty.

- **Uncertain regulatory system.** Though tariff setting authority had been transferred from the Delhi government to the Delhi Electricity Regulatory Commission (DERC) in 1999, the commission had only a limited track record in regulating DVB. Moreover, in a May 2002 tariff order DERC had stated that it was not prepared to switch from an annual cost of service tariff (the historic norm in India) to a multi-year tariff system. [8]

More specifically:

- DVB's transmission and distribution losses were estimated at almost 50% because of a large number of unmetered and illegal customers and under billing and poor collections. [9] According to the CEO of the BSES discoms, a major portion of the losses were attributable to theft by industrial consumers and well-to-do residential customers.

- Like many state electricity boards in India, DVB also had major financial losses. It had accumulated receivables of about US $400 million. No audited financial statements had been prepared for more than a decade nor was there a register of assets or an accurate master list of customers. Similarly, there was poor information about which customers were in arrears.

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[7] This is a common problem for all state electricity boards (SEBs) in India. While DVB's data on customer billing and collections was weak, there was no evidence that it was worse than comparable data for other SEBs.

[8] The Commission said that "[A]lthough 'multiyear tariff setting principles' is an issue that merits consideration it is not the mature stage for fixation of multiyear tariff principles for the purpose of this Tariff Order." May 2002, P. 58.

[9] Prior to privatization, it appears that most customer payments to DVB were in cash. Cash payments are more susceptible to theft. It has been reported that the North Delhi Power Limited company now collects about 65% of customer payments by cheque and 35% in cash.

- DVB's customers were unhappy with the quality of service and supply. Customers faced regular power cuts especially during peak summer and winter hours. Many customers found it necessary to purchase expensive back up equipment to protect themselves against DVB's frequent interruptions. Customers also complained about indifferent and corrupt DVB employees. The strong public resentment over DVB's existing operations was probably crucial in persuading the DVB employee unions not to oppose the privatization.[10] Public antagonism towards DVB made it easier for the Delhi government to take a strong pro-privatization stand.

- DVB was also a major financial drain on the Delhi government. In the several years before privatization, the Delhi government was forced to provide DVB with annual subsidies of US $200 to 300 million.[11] There was no reason to believe that the level of subsidies would diminish as long as DVB remained a state enterprise.

- It is quite common throughout India for the state electricity boards to be a major financial drain on the state budgets. As one government official in another state observed: "the government was hemorrhaging through the[SEB]and was getting absolutely nothing in return."[12] But Delhi had an additional problem. DVB's service was so bad that it had also become a clear political liability. Ultimately, it was probably this **combination** of political and financial liabilities that convinced the Delhi that it had to privatize DVB.

Transfer Scheme and Timing of Corporatization

The process by which the companies are made ready for privatization can have a significant impact on the outcome of the sale. In Delhi:

- The assets and liabilities of DVB were first transferred to the Delhi government and then to six successor companies—one generating company, one transmission and bulk supply company, three distribution companies and one Holding Company. The three distribution companies were privatized but the three other companies continued to be owned by the Delhi government.

- The entire capital of the successor companies (equity and debt) was held by the new Holding Company which was 100 percent owned by the Delhi government. The total capital, and therefore total assets, was valued on the expected ability of the revenues of the company to service the liabilities—a business valuation

[10] One key player in the process observed that there was "enlightened union leadership" and that DVB's employees "knew opposition to reforms would provoke hostility." Jagdish Sagar, "DVB Restructuring & Privatisation of Distribution in Delhi," August 2002, p. 56.
[11] Technically these were loans from the Government to DVB but there was a widespread expectation that the loans would not be repaid. A significant share of the $200 to 300 million represented compounded interest on earlier loans.
[12] Bakovic, Tenenbaum and Woolf (2003, p. 41).

exercise, explained further below—rather than a valuation based on the book or market cost of existing assets.

The Sale Process

When structuring the transaction provides opportunities to attract investors and send signals as to what are considered to be key issues that the new operator will have to address.

- Six entities - AES, BSES, Cescon, China Light & Power, Reliance Power and Tata Power - were pre-qualified but only two entities-BSES and Tata- submitted proposals in response to the RFP. [See Appendix B for a chronology of events.]

- Unlike Orissa where investors bid a price for a 51% equity interest, the bids submitted by BSES and Tata were for a five year trajectory in improvements in technical and commercial losses. (See "Bidding For What?") In Delhi, fixed values were specified by the government for the equity interests. As a consequence, there was no bidding for these interests. Instead, the bidding was for loss reductions. In this sense, the payment for equity was like a payment for an admission ticket which, in turn, gave an investor the right to bid for loss reduction.

- The par values established by the Delhi government corresponded to payments of:
  - Rs. 687 (USD $14.61 per attached customer) for the Central and East discom (renamed BSES Yamuna Power Limited);
  - Rs 2,763 (USD $58.79 per attached customer) for the South and West discom (renamed BSES Rajdhani Power Limited); and
  - Rs. 2,526 (USD $53.74 per attached customer) for the North and Northwest discom (renamed North Delhi Power Limited).

  This compares to an average payment of Rs. 520 (USD $11.06) per attached customer in Orissa.[13] The total amount of money received by the Delhi government for the three discoms was Rs. 481 crores (USD $102.4 million).

Bidding For What?

- As noted above, the form of competition chosen for the Delhi transaction was one where the private operators bid on the level of technical and commercial loss reduction to be achieved over the five years. The government proposed that losses would be calculated annually using a concept called Aggregate Technical and Commercial Losses (AT & C) (The AT & C concept and calculation are described in more detail later in " Measuring Losses" and Appendix D.)

[13] Hoskote, Marghub and Ostrover (1999)

- To guide bidders, the Government specified in the RFP a set of minimum bids that it would accept for each of the companies.[14] These targets were set in the hope of reducing losses from an average of over 50% to around 30% after five years. The government's proposal allowed variation in the loss reduction end points set for each company. For two of the companies (South and North), the government set a target of about 28% at the end of the period while the target for the third company (Central) was set at 36%. These different end point targets reflect significant differences in the starting values. The government's targets implied a narrowing of the cross-company margins over the five year period. Table 1 sets out the minimum loss targets specified by the government and the targets that were ultimately accepted in the signed privatization agreement.

- During the bidding process no compliant bids were received. BSES and Tata stated that they would not be able to meet the government specified targets. Instead, both companies responded with bids that would commit them to achieving cumulative loss reductions of 5 to 10% less than the government's targets. The values negotiated and agreed to by the companies are also set out in Table 1. By the end of the five year period, the companies proposed that AT & C losses would be between 30% and 40% with the margin between the worst performing company and the others actually growing over the period. It is also possible to see from the table that the bidders were on the whole much more pessimistic about early reductions in losses, but they expected to be able to do better towards the end of the period.[15]

Table 1: Minimum loss targets and actual figures bid

Region	% decrease in AT & C losses					AT & C losses at end of period
	2002-3	2003-4	2004-5	2005-6	2006-7	
Minimum stipulated by Government in RFP						
Central/East	1.50	5.00	5.00	5.00	4.25	36.45
South/West	1.25	5.00	4.50	4.50	4.00	28.85
North/North West	1.50	5.00	4.50	4.25	4.00	28.85
Agreed after negotiation						
Central/East (BSES)	0.75	1.75	4.00	5.65	5.10	39.95
South/West (BSES)	0.55	1.55	3.70	6.00	5.60	30.70
North/North West (Tata)	0.50	2.25	4.50	5.50	4.25	31.10

[14] The privatization produced a number of court challenges. As a consequence, the RFP, the Information Memorandum and several other documents associated with the privatization are now in the public domain.

[15] The private companies may have sought low loss improvements in the first two years for another reason. Prior to privatization, DVB filed a petition with DERC requesting that the commission accept certain opening values for loss levels. DERC responded to this petition by fixing lower initial values than those requested by the companies. From the bidders' perspective, these lower initial values meant that the regulator had already factored in some efficiency improvements that they would have to achieve. If the private companies thought that DERC's initial values were unrealistic, their logical response would be to commit to lower improvements in the early years to compensate for the implicit efficiency improvements already embedded in the values set by the regulator. In its first post-privatization tariff filing, the North Delhi Power Company asserts that the actual AT & C value at privatization was more than 60 percent rather than the 48% allowed by the commission. But the NPDL number may have been based on the AT & C value for a single month rather than a 12 month average.

Source: Jagdish Sagar, *DVB Restructuring and Privatization of Distribution in Delhi*, presentation at the World Bank, August 2002.

Asset Valuation

A vital building block for regulation and an important signal to investors as to the perceived value of the services being sold is the asset value. Three issues need to be considered:

- the starting value determined for the assets;
- the financial structure chosen for the companies; and
- the way in which additions to the asset base (investment) are treated in tariffs.

The Starting Point

- In 2001 the total liabilities of the electricity sector (primarily government loans and power purchase dues) in Delhi was a little over Rs 23,100 Crore (over $5 billion).[16] Effectively the servicing of these liabilities had not been met by DVB's customers but rather by taxpayers. If the government had tried to transfer all the existing liabilities to the new private distribution companies and required them to meet the servicing costs, this would have required a significant increase in retail tariffs (taxes, of course, should fall correspondingly). The Delhi government did not do this. Instead, it asked its advisors to undertake an analysis of what would be a sustainable level of liability (expecting the businesses to be self-sustaining within five years), assuming:
  - a reasonable retail tariff increase from the prevailing level (which required predicting the regulator's future actions); and
  - efficiency improvements.

  After attaching specific values to these two assumptions, the Delhi government established an allocation of liabilities. This is set out in Table 2.

Table 2: Allocation of liabilities (Rs Crore)

Successor Entity	Equity Share Capital	Debt	Serviceable Liabilities (regulatory asset base)
Genco	140	210	350
Transco	180	270	450
Discom 1	116	174	290
Discom 2	460	690	1,150
Discom 3	368	552	920
Total	1,264	1,896	3,160

Source: Jagdish Sagar, *DVB Restructuring & Privatisation of Distribution in Delhi, Presentation at the World Bank,* August 2002.

As can be seen, *the regulatory asset base of Rs. 3,160 crores for all five companies (equity capital share plus debt) was less than 15% of the existing total liabilities.* Some of this had been foreseen by the regulator (DERC) in its 2001 tariff order in

[16] According to a presentation by Mr. Jagdish Sagar in 2001 the approximate split of liabilities is 60% power purchase dues and 40% loans, with a small (less than 5% of total liabilities) pension liability.

which it disallowed interest payments on about 40% of the value of debt based on a 'used and useful' evaluation of the assets of DVB.[17] However, once the government established these numbers in the formal transfer scheme and specified the numbers in its directions to the regulator, DERC was required to accept these numbers as the starting values in its retail tariff setting formulas.

Financial Structure

- A common financial structure was adopted for the three privatized distribution companies. The companies were created with 60% debt and 40% equity (on a book value basis). Several questions are raised by this approach:
  - If the expected profitability and investment needs of the companies are different, does the common financial structure approach provide sufficient flexibility for the bidders?
  - Given the possibilities of losses, especially in the early years, does the 40% equity provide a sufficiently large reserve that can act as a cushion when losses are booked against it? [18]

  This latter point may not be relevant since the primary cause of losses would be missing the ATC targets and these were determined by the companies in the bidding process.

New Investment

- The treatment of the investment by the companies in the Delhi privatizations is not entirely clear. No formal multi-year tariff framework was established at privatization (discussed in more detail later). As such, no formal agreement was reached on an investment plan for the five years and consequently the companies face some regulatory uncertainty about the treatment of investment made to achieve loss reductions.

- Before privatization, the regulatory agency, DERC, had followed the standard Indian approach of remunerating investment through the asset valuation system – by employing Schedule 6 of the 1948 Electricity (Supply) Act. This allows a return on net assets but the allowed return is not automatic. The Commission reserves the right to determine whether particular assets are "used and useful." Since the commission's determination is not known in advance, this creates regulatory risk for the companies.

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[17] Petition No 1/2001, DERC, order 23rd May 2001. Under traditional cost of service regulation, it is not uncommon for the regulator to disallow (i.e., not allow to be recovered in tariffs) some portion of the regulatory asset base.

[18] If something goes wrong (e.g., sales are lower than expected or tariffs are not allowed to increase), the private investor will not be able to meet debt payments unless there is an equity cushion. Equity provides the cushion because, unlike debt, payments to equity owners are not mandatory. If a company fails to pay a dividend to its equity holders, it cannot be forced into bankruptcy for non-payment of a financial obligation, which could happen, however, if it misses a principal or interest payment to debt holders. The problem of an inadequate equity cushion (i.e., over leveraging) has arisen in several major discom privatizations in Argentina and Brazil.

- The design of the regulatory regime and the moratorium on debt repayment means that there should be internally generated funds available for new investment.[19] As such, the risk to the operator is reduced and investment may be incentivized – although the operators could, of course, just take this 'free cash-flow' as dividend payments.

Subsidies

As noted earlier, subsidies had played a major role in the financing of DVB in the past and were set to play a major role for the transition period after privatization. Two issues had to be addressed:

- the level of subsidies that would be available; and
- the mechanism for delivering the subsidies.

How Much?

- The Delhi government committed to subsidize the new private discoms for up to Rs 3,450 crores (USD $720 million) for a period lasting no longer than to 5 years.[20] No specific amount of money was targeted for each discom. Nor were there any restrictions on the amount of subsidy that could be provided in any one year. This left open the possibility that the 3,450 crores could be used up within two or three years rather than being spread over the full five years.

How Delivered?

- In Delhi, the mechanism for delivering the subsidy was to give the discoms a discount on the price that they paid for power purchased from Transco, which continued to be owned by the government. About 20 percent of Transco's power supplies came from its own generators and 80 percent from power purchased from other sources. In the first year after privatization, it is estimated that the three discoms would buy power from Transco at an average price of Rs 1.51 (US 3.17 cents) per kWh while it would cost Transco about Rs. 2.40 (US 5.04 cents) to acquire and deliver this electricity to the discoms.[21] This meant that Transco would lose almost a rupee or about US 2

[19] This moratorium relates to the HoldCo loans made to the discoms. The moratorium covers a four-year period.

[20] The discoms are also eligible for Government of India grants for distribution capital investments. Under this program known as the Accelerated Power Development and Reform Program (APDRP), power enterprises are eligible to receive grants of up to 25 percent of the capital cost for approved investments in distribution facilities. The grants are available to both public and privately owned power enterprises. Since the program is available to all power enterprises in India, we have not included it as a subsidy program that is specific to the Delhi privatizations.

[21] A commonly heard rule of thumb is that a well-run urban electricity distribution company should be financially viable if its distribution margin (i.e., the difference between its average tariff to its customers and the average price that it pays for power purchases) is at least US 3 cents per kWh. Since the Delhi discoms are paying about 3 cents for their power purchases (Rs. 1.51) and selling the power at an average price of about 8 cents per kWh (Rs 4), it would seem that they have a comfortable distribution margin of 5

cents on every kWh that it sold to the discoms. To deal with these losses, the Delhi government agreed to provide the Transco with loans of up to the Rs. 3,450 crores limit over a five year period.

The Regulatory Regime

In almost every major international survey of power sector investors, the regulatory system is usually listed as a key factor affecting investors' decisions to invest. [22] Some aspects of the regime have already been discussed, such as the treatment of asset valuation. Three specific issues are addressed here:

- the respective roles of the government and the regulatory commission;
- whether the regulatory framework developed was sufficient and credible; and
- the form of revenue sharing that was proposed.

The Government Versus The Regulator: Who Decides What?

- DERC began functioning in December 1999, three years prior to the privatization. In this initial period, DERC regulated only DVB. Like most Indian commissions, it used a traditional annual cost of service approach prescribed by Schedule 6 of the 1948 Electricity (Supply) Act.[23] In January 2001, DVB requested that the commission switch to a performance-based, multi-year tariff setting approach. In May 2002, the commission turned down DVB's request on the grounds that the quality of existing cost and operational data was too poor to support a multi-year tariff (MYT) system. However, the commission left the door partially open for the future adoption of a MYT system with the general statement that "the Commission shall be willing to consider any suggestion in this regard at an appropriate stage in the future."[24]

- When the Delhi government began considering privatization, it was advised that the commission's existing tariff policies would be a major impediment to successful privatization. The principal concerns were that DERC would:

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cents per kWh. But even with a 5 cent margin, the discoms will not be financially viable as long as their technical, commercial and collection losses are so high.

[22] Lamech and Saeed (2003).

[23] Both India and the US use a cost of service approach in setting retail tariffs. However, there is one major difference between the two regulatory systems. In India, state electricity commissions are required to perform an annual cost of service review known as the annual revenue requirement (ARR) determination. In contrast, US state regulatory commissions are not obligated to conduct an annual review. US commissions will consider reviewing a company's tariffs only if the company or its customers file a formal request for a review. Some US utilities such as Kentucky Utilities and Florida Power and Light have operated for many years without having to file new tariffs with their state regulatory commissions. In recent years, many US state commissions have moved to performance-based, multi-year tariff systems similar to those being discussed in India. For a description of these changes in US regulation, see Brian Williamson, *UK 'Incentive' Regulation: International best practice?* in *Regulatory Review 2000/2001*, Centre for Regulated Industries, UK.

[24] Delhi Electricity Regulatory Commission, *In the Matter of Annual Revenue Requirement for the Financial Year2000-2001and Tariff Determination Principles for the years 2002-03 til 2005-06," May 2002, p. 58.*

1. continue to set retail tariffs based on an annual cost of service approach (i.e., not adopt a multi-year tariff system);[25]
2. assume unrealistic (i.e., too low) initial technical and commercial loss levels; and
3. require improvements in technical and commercial loss levels that were unrealistic (i.e. too high).

It appears that the Delhi government was concerned that if DERC did not establish reasonable targets and give sufficient certainty as to what its tariff setting policies would be, potential investors would be reluctant to invest and the privatization effort would fail. Consequently, the government decided to issue a policy statement that required DERC to adopt certain tariff policies that the government believed were necessary to attract private investors.

The Delhi Government Policy Directive

- In November 2001, the Delhi government issued a "policy directive" that: [26]
  - ✓ Defined the process of privatization.
  - ✓ Proposed a set of opening loss levels for tariff setting purposes but which still needed DERC's approval.
  - ✓ Specified that bidding would be on the basis of a multi-year loss reduction trajectory rather than bids for the price of the equity interests.
  - ✓ Mandated a sharing mechanism for revenues if the new private discoms beat the annual loss values specified in the trajectories accepted by the government.
  - ✓ Required that DERC adopt the annual loss targets accepted by the government in the privatization agreement when the commission set annual tariffs for the discoms.
  - ✓ Specified that retail tariffs can change over time but would have to remain uniform across the three private discoms during the 5 years following privatization.
  - ✓ Required the regulator to set the prices that the discoms pay for power purchases from the Transco as a derived number based on an annual calculation of the estimated shortfall in the discoms' annual revenue requirements.
  - ✓ Committed the government to provide a loan to the Transco to allow it to subsidize the discoms' bulk supply costs up to a maximum of Rs. 2,600 crores (US $546 million, later increased to US $692 million or Rs. 3,450 crores).

Revenue Sharing

- As part of the system of incentives for loss reduction put in place, it was decided that when a reduction in losses brought about an increase in revenue, 50% of the additional revenue could be kept by the operator for the length of the first set of

[25] Jagdish Sagar observes that "Policy Directions became necessary because of [the] Regulator's unwillingness to fix five-year tariff setting principles." See Sagar (2002), p. 54.

[26] The November 2001 policy directive was further clarified by the Delhi government in a second policy directive issued in May 2002.

targets (five years).[27] Revenue-sharing, however, only counts for gains above the minimum targets set by the Government – so any improvement from the negotiated level to the original minimum target is given entirely to consumers.

- Clearly, revenue sharing is a way of helping ensure political and social acceptability of a transaction. This is especially important when great uncertainty exists about the ability of the operators to meet the targets that have been set – the lack of competition for the companies obviously increased the need for this type of protection. However, protection comes at a cost and the following section considers the incentive dampening impacts of this type of sharing arrangement.

[27] Details are found in the Government Order and the DERC February 2002 Order.

Observations, Analysis and Recommendations

Having provided an overview of the details of the transaction, we now turn to an analysis of the decisions and the underlying strategy both with respect to the privatization process and the regulatory system that accompanied it. Based on this analysis, we make eleven recommendations for the design and implementation of future privatization transactions in India and elsewhere.

Politics

- Political support and the establishment of clear high level political champions seems to be a universal prerequisite for successful privatization whether in developed, transitional or developing economies. As such, the support provided by the Government in Delhi was vital – a window of opportunity was established and then taken. The high level political support was made operationally effective by the fact that there was a small group of Delhi government officials who could respond quickly to the inevitable "crises" (e.g., lack of compliant bidders) that arise in any attempt at privatization. Elsewhere in India, there is often a gap between the rhetoric and reality of power sector reform. In Delhi, the Chief Minister ensured that the rhetoric and reality were one and the same, at least during the period leading up to the actual privatizations.

- Windows of opportunity are small even at the best of times. In India the frequency of elections and the whole political cycle usually means that there is no more than two and a half year window of opportunity during which the reforms and actual transaction must occur. Consequently, keeping to the timetable and focusing on key issues are critical for a successful transaction.

- The general public must be clearly informed that the government is pursuing privatization and that the privatization is likely to lead, at least initially, to higher prices. From the public's perspective, the **quid pro quo** is that the higher prices must be accompanied by improvements in service (both technical and commercial) and the confidence that the regulatory system will protect them from being "ripped off" for the benefit of private investors. However, once the government publicly announces the decision to privatize, it must have the flexibility to use its judgment to seek the best deal possible. <u>This means that it is probably neither feasible nor desirable to have public consultations on the terms and conditions of the privatization deal during the period of bidding and negotiations</u>.

- There are several dangers in requiring such public consultations during the privatization process. First, they are time consuming when there is likely to be a small window of opportunity. Second, they may hurt the government's bargaining position. Third, they are likely to politicize the entire process. Privatization is always a very appealing target for out of office politicians. None of this is meant to imply that the government should be unaccountable for its actions. Clearly, a government must be held responsible for the outcome of the privatization process. If the

government (acting on behalf of consumers) fails to get a good privatization (i.e., a privatization with an absence of corruption that leads to better service at reasonable prices), then any corrupt government officials must pay penalties and the government will pay the consequences at the next elections.

The government commitment must also go beyond the pre-privatization period. In India, the "acid test" of whether a government is genuinely committed to the reform is its willingness to uphold "law and order" at the ground level so that the discom can take the necessary but unpleasant actions against customers who steal electricity or who do not pay their bills. A long time observer of power sector reform in other countries once remarked that the true test of the seriousness of a government's commitment is whether it is whether it is willing to prosecute rich people and members of its own political party who steal electricity.

Recommendation 1: Political Commitment

Any distribution privatization in India must have the clear and active support of the Chief Minister. Undertaking such a transaction without the clear commitment of the Chief Minister will be a recipe for delay, dispute and frustration. A government needs to enter into a transaction with its eyes open, aware of the implications and a willingness to keep to strict timetables. Further, support for the transaction needs to be wider than just the Chief Minister and so support from other stakeholders needs to be mobilized.

Privatization Process

Transfer Scheme and Timing of Corporatization

- Since there was no reliable listing of assets, there was no choice but to value the discoms based on expected future revenues and costs. But even if there had been a reliable register of assets, it is still generally preferable to use a business valuation approach because the value of a business will not necessarily be related to the sum of its physical assets. However, it can be difficult to use the business valuation approach when future revenues depend on a regulatory system that is incompletely defined. As discussed below, the proposed regulatory system was better defined in Delhi than in Orissa but not as well-defined as in Latin America where there have been more than 60 discom privatizations over the last 15 years. The need for greater regulatory specificity has been recognized in the draft National Tariff Policy recently issued by the Government of India's Ministry of Power.

- The Delhi government chose not to corporatize (i.e. created as separate legal entities) the three distribution companies until the moment of privatization. In contrast, other Indian states such as Karnataka and Andhra Pradesh have opted to create separate publicly owned corporations significantly before privatization. The same was also true in Orissa. (An overall comparison of the Orissa and Delhi privatizations can be

found in Appendix A.) In Orissa, there was a delay of over a year between the formation of the distribution companies with clean balance sheets and the actual privatization.[28] As a consequence, the government owned distribution companies accumulated large receivables and payables during this one year period. Since there was no attempt to do any further cleaning up of the balance sheets at the time of privatization in Orissa, these newly accumulated receivables and payables became a source of post-privatization disputes – this could have been avoided if a second 'transfer' had taken place at the time of privatization.

- In Delhi, the three distribution companies were corporatized just at the moment of privatization. The *advantage* of the Delhi approach is that it ensures that the balance sheet seen by investors at the time of bidding is exactly the same balance sheet that is handed over on the day of privatization (with the Holding Company acting as the buffer to take care of adjustments).[29] The *disadvantage* of the Delhi approach (where several contiguous discoms are being privatized) is that it leads to uncertainty over exact boundary lines, ownership of moveable assets, responsibility for shared services and allocation of shared costs. After privatization, the Delhi discoms have had to spend time trying to sort out who owned what—time that presumably would have been better spent on improving service and reducing inefficiencies.

- Delhi has the advantage and disadvantage of being the capital of India. If nothing else, this means that anything that happens in Delhi is highly visible. This presumably creates a strong incentive for the new private owners to bring in the resources necessary to produce a noticeable "turnaround." For example, it was reported that BSES had more than 50 of its own people on the ground in Delhi on the day that they took over their two discoms. By contrast, in Orissa it appears that the initial new staff was limited to three retired individuals whose work was supplemented by monthly 3-4 day visits from BSES's senior management.

Recommendation 2: Two Transfer Schemes

When sufficient time exists, use two transfer schemes. Create separate (but still publicly owned) distribution companies in the first transfer scheme. Create a second transfer scheme that coincides with the date of privatization and which provides for a clean balance sheet for the new private discoms.

Sale Process

- There is always political pressure on a government to get more money for its assets. But ultimately, these higher payments for equity will have to be recovered by the new

[28] A clean balance sheet generally means that payables are at level that can be serviced, receivables are realistic (i.e., it is expected that most of them will be collected) and the principal and interest payments on long term liabilities can be serviced.

[29] It is a buffer in the sense that the most of the assets and liabilities of DVB (along with the problems and uncertainties associated with them) are transferred to the Holding Company and will not be a direct concern of the discoms.

owners through higher tariffs. So a basic decision for any government is: should it try to maximize the equity payments? If it tries to maximize the price paid for the equity that it is selling, it runs the risk that the enterprise will not be financially viable. Delhi adopted a different strategy. It established relatively low par values for equity in the hopes that this would help to create discoms that would soon be financially viable.

- It is not clear why four of the companies decided not to bid. The two foreign businesses may have just been reacting to the general worldwide withdrawal of international players from power sector investments in developing countries. Reliance is now the owner of BSES and consequently may, at the time, have not wished to be bidding against a company it was considering acquiring. This is, however, pure speculation. What is important is that other Indian states considering private sector participation should seek to understand what it is that attracts investors. Simple things like the size of the deal may be important. By splitting Delhi into three separate distribution businesses the Government may have made it simpler to undertake benchmark regulation in the future but may also have made the companies too small to be of interest to international investors. [30] Investors are always anxious to know what risks they are being asked to bear. Therefore, state governments and their privatization advisors should always try to be as clear as possible as to what risks will be borne by investors and what risks will be borne by the government or electricity consumers. One way to do this is to present the key risks in the Information Memorandum with an assessment of what entity will be bearing each risk. (See Appendix C for a typology of risks associated with the privatization and operation of discoms.)

- The bids submitted by BSES and Tata for loss improvements were below the minimum values specified by the Delhi Government. Therefore, the government established a special committee called the Core Committee consisting of high level government officials to negotiate with the two bidders. The final negotiated bids were the outcome of this process and were between the government's specified values and the initial offers of BSES and Tata.

- Although loss trajectory was the key point of contention, other issues that were negotiated included:
  - the level of required loss improvements at which additional profits would be granted to the companies;[31]
  - the length of a moratorium on principal and interest payments by the discoms on loans received from the government owned Holding Company [it was extended

[30] However, there is some evidence that size was not a major concern of potential foreign investors. It was reported that one potential foreign investor said that it decided not to bid because of the absence of complete multi-year tariff system and the general poor state of the Indian power sector. More recently, investment bankers report that foreign power companies are only interested in the largest sales given their disenchantment with power sector investments in developing countries.

[31] This is in contrast to most Latin American countries where **all** additional revenues produced by beating the specified multi-year loss targets go the company (i.e., are not shared with customers).

from 3 to 4 years with an additional proviso that it would be extended to 5 years if a discom did not meet the negotiated loss reduction target]; and
- a limit on the amount of contingent liabilities passed onto the discoms. The discoms accepted a ceiling of Rs. 1 crore on contingent liabilities; any amounts above this ceiling would be borne by the Holding Company.

- The current reality is that investor interest in distribution privatizations –in India and other developing countries—is very limited. As a consequence, most recent distribution privatizations have attracted only a small number of bidders. In some developing countries, it is not uncommon to have only one remaining potential buyer at the final stage of the bidding process for distribution assets (Uganda and Moldova). As a consequence, many governments find themselves forced to negotiate the final terms and conditions of the privatization agreement with a single company rather than receiving competitive bids from several companies. This can create serious political problems because such negotiations often lead to allegations of corruption or incompetence, even if there is no credible evidence to support the allegation.

Recommendation 3: Mandated *Ex Post* Transaction Assessment

A government should always require a report by an independent high-level committee that assesses the reasonableness of the sale process regardless of whether the sale takes place through bidding, negotiation or a combination of the two.

Observation: In almost any major privatization, there will always be allegations of corruption and incompetence. Therefore, it is important that the general public have confidence that the government obtained a reasonable set of terms and conditions. To reduce the likelihood of corruption or incompetence, an independent assessment should be mandatory. In India, two respected government entities—the Comptroller & Auditor General(C&AG) of India and the Central Vigilance Commission(CVC)—already perform this function. The C&AG report on the privatization will become a public document when it is handed over to the Delhi legislative body. Therefore, if this is the norm in India, it is not obvious that anything would be gained by having another separate review by an *ad hoc* committee. However, entities like the C&AG and CVC may not exist in other countries or they may not have good reputations for impartiality. In such countries, an after the fact outside assessment should be built into the privatization process. A good model for such an assessment process can be found in the 1994 French law known as the Sapin Law. The law, which was passed in response to several major scandals in the awarding of municipal water concessions, provides for an after the fact assessment when a municipal government awards a water concession. The disadvantage of this recommendation is that the government representatives, knowing that their actions will be audited, may become preoccupied with leaving a "paper trail" rather than obtaining the best terms for the government and consumers.

- The Delhi government hired SBI Capital Markets, an Indian investment banking firm, to advise it on the privatization. In Delhi, the government paid Rs. 3.52 crores (USD

$700,000) for consultancy services compared to about Rs 306 crores (USD $63 million) paid for consultancy services by DFID and the World Bank in Orissa. The fact that the amount spent on consultancy services in Orissa was 90 times larger in Orissa than in New Delhi is striking and merits further examination.

- It appears that the principal reason for the difference is that a significant portion of the Orissa funding was used for "institution building" of the existing state owned enterprises prior to privatization. It is also unclear whether this large expenditure had much of an effect either on the operations of the state owned distribution entities or on the prices that were paid for them. In contrast, the Delhi government decided to sell the discoms on an "as is, where is" basis. Because of time pressure and a belief that the "institution building" was not likely to be successful, it appears that the Delhi government concluded that there was little or nothing to be gained by spending a lot of money trying to improve DVB as institution.

Bidding For What?

- When a government decides to privatize, it can seek bids one or more parameters including price per unit sold, a lump sum payment for equity, the lowest lump sum subsidy, one or more quality of service parameters or one or more efficiency parameters. Each bidding base has pros and cons that must be weighed when determining which one to utilize for a transaction.[32] The specific question raised by the Delhi experience is: does bidding for the loss reduction targets make any difference when compared to other forms of bidding? The answer depends on which stakeholder is being considered. From the company's perspective the choice can have an important impact on the sharing of gains or costs which will then affect the allocation between government and consumers. Of course, if there were perfect information then the choice makes no difference because there is a finite set of variables. If the remaining variables are fixed by the agency undertaking the sale, then in a world of perfect information the same outcome would be achieved regardless of which variable is bid on. However, we live in a world of less than perfect information!

- The selection of the bidding parameter should reflect the problems that the government is trying to solve. In Delhi, the two big concerns of the government were:
  1. to provide reliable electricity at reasonable cost; and
  2. to reduce the government's ongoing need to subsidize the power sector.

  Since the existing high level of technical and commercial losses was the principal cause of both of these problems, we think that the Delhi government made the right decision in focusing on loss reduction as the bid parameter.[33] In contrast, the Orissa

[32] See Baldwin and Cave (1999), Table 21for a good summary of the issues surrounding some of the common bases for bidding.

[33] An alternative approach that would almost achieve the same outcome would be to bid on the basis of an 'X' factor if an RPI – X style multi-year tariff was being put in place. The 'X' factor would capture all forms of efficiency available to the operator and so would be more comprehensive than just a loss target.

approach was to seek bids that focus on the 'value' of the equity and can be perceived as trying to maximize the amount of money received for the equity that was being sold, given the constraints set by the other parameters. While this may increase the government's revenues at the time of privatization, it runs the risk of reducing the financial viability of the new enterprises because whatever these companies bid for equity will eventually have to be recovered from their customers in the form of higher tariffs – especially when the other parameters are uncertain or dependent on other agencies such as the regulator. We think that bidding for losses combined with a specified payment for equity is a reasonable approach.

- So, did it make any difference that the New Delhi government chose the loss reduction targets as the bidding variable? The answer is probably yes, for three reasons:
  1. this choice of variable clearly identifies to bidders what the Government sees as the primary efficiency driver and so focuses the bidders on the appropriate elements of the business;
  2. linked to the above, the bidders are openly setting what they believe to be achievable targets for the key variable, this is something that they can then be monitored against in a transparent manner and which helps remove an important element of regulatory uncertainty; and
  3. given the importance of the loss figures and clear ability for the Government to get the numbers out of line with what bidders believed would be achievable, this approach saved them from the potential embarrassment of having to sell the equity below the "announced sale price." For political economy reasons this may be very important – the Government would not want to be perceived as selling assets "cheaply." In Brazil, the opposite happened. The government sought bids for equity and it generally received high bids.[34] The Brazilian government seemed more concerned about maximizing the proceeds of the privatization than the long term sustainability of the sector. But now the private distribution companies are pressuring the regulator to allow them to recover what they paid for the assets. In particular, the distribution companies have now argued that the regulatory asset base used to set tariffs in the second multi-year tariff period must be set equal to the amounts that they bid for equity at the time of privatization.

However, three issues arise here. First, losses dominate by far the other inefficiencies within the companies owing to their magnitude. Second, monitoring the outcome would be more difficult – base-line losses would be built into the revenue calculation and then the all encompassing X factor would be set. This could blunt the ability of the regulator to determine what is happening to losses and make the next price setting exercise more difficult. Finally, since a full RPI-X multi-year tariff was not proposed in Delhi, the choice of the Government to specify a loss target rather than overall 'X' target seems the best that was available.

[34] This was not uniformly true. Four of the companies sold did not attract premia. For example, the state of Sao Paulo received unexpectedly low bids for the sale of equity to AES for ElectroPaulo, the distribution company that served most of Sao Paulo. In May 2003, an investigation by the British newspaper, the *Financial Times*, found evidence that AES had persuaded Enron to drop out of the bidding the night before the bids were due to be submitted.

Recommendation 4: Bidding For What?

When choosing the criteria for determining the sale there are several simple rules that can be followed. These are to choose a variable that:

- **is acceptable for political economy reasons;**
- **focuses the bidders on the real controllable problems confronting them;**
- **is transparent so that future performance is easy for all stakeholders to measure; and**
- **helps create greater regulatory certainty in the short- to medium-term.**

Observation: Focusing on a factor that is clearly under the control of the bidder helps create greater certainty and a clearer undertaking for the winner. Bidding on a general factor like the equity value is less transparent since determining the factors driving the evaluation of that value is less explicit.

Measuring Losses

Having placed a major emphasis on losses it is important to understand the basis for calculating losses and the implications that this has for the operator.

- Losses are inherent in the operation of any electricity distribution system in the world. Losses can be technical or commercial in nature. Technical losses are the losses attributable to heat and friction that are caused by the physical operation and design of any distribution system. Commercial losses are losses that result from improper billing, non-metering of consumers and direct theft. Commercial losses may also result from inappropriate operational actions such as theft of cash from billing and collection. In India it is usually assumed that theft by consumers, sometimes with the assistance of the power enterprise's employees, is by far the dominant form of 'commercial loss' and hence the usage of this term.

- The big difference between developed countries and developing or transitional countries is in the size of the losses. Developed countries have been able to achieve overall loss levels at 10% or less and these losses are comprised almost exclusively of technical losses. But this is not the case in India and many developing countries. For example, in Delhi, actual loss levels prior to privatization were at levels of 50% or more. And these high losses were attributable mostly to theft. When a discom has 50% losses, it needs to purchase 150 kWhs of electricity from a bulk power supplier in order to bill its customers for 75 kWhs. This means that 50% or more of the discom's product is not sold and, as a consequence, it is not available as a source of revenue. However, the discom is still legally obligated to pay for 150 kWhs of power. With losses like these, it is unsurprising that many state owned enterprises in India are bankrupt.

- The critical decision for any regulator or any government that wishes to privatize distribution is how to account for losses in fixing tariffs for retail customers. The most common regulatory approach in both developed and developing countries is to

include a "grossing up" factor in the tariff setting formula. The gross up factor will be based on some measure of losses. In a developed country, if a distribution company meters and bills 100 units of electricity from its customers, its regulator would normally allow the company to charge its customers the cost of acquiring 108 to 112 units of electricity from the discom's suppliers. However, in India where theft has been rampant, the regulator (or the government in a privatization agreement) may initially have to allow the discom to include 140 or 150 units of electricity as an allowed level of bulk power purchases for the 100 units that it bills its retail customers.[35] Over time, the regulator would want to reduce the size of the allowed "gross up" element so that the discom will have an incentive to try to reduce these costly losses. Most of the debate in India on losses has focused on the size of the initial allowed losses and how quickly losses should be reduced. The Delhi government has been criticized for accepting loss reduction targets that its critics allege were too easy.[36]

- In Orissa, the regulator, rather than the government, set both the initial level of losses as well as the annual targets for reduction in loss levels. With the benefit of 20-20 hindsight, it is now generally agreed that the Orissa regulatory commission (OERC) set unrealistic values for both parameters. The advantage of setting a low initial value is that it provides a justification for smaller tariff increases.[37] The disadvantage is that it may make it all but impossible for the discom to achieve financial viability. Some of the financial losses in Orissa resulting from unrealistic initial loss values have now been converted into 'regulatory' assets by the commission. However, this compromise solution does not provide immediate support to the operator since it bears the whole cash cost of the losses in the year that they are incurred and then recovers these losses over an assumed life for the 'regulatory' asset.

- In Orissa and elsewhere in India, the traditional approach for measuring losses has been to try to measure transmission and distribution (T&D) losses. This requires measuring energy inputted into the transmission grid and energy billed to distribution customers. However, it is relatively easy to "game" or "fudge" this number. It can be done by simply inflating the billing numbers. This is relatively easy to do in India because the consumption of so many agricultural customers has to be estimated because there are no meters in place.

- The target for loss reduction used in Delhi focused on a concept called the "Aggregate Technical and Commercial Losses" (AT&C). The name is not totally accurate since the actual formula measures technical, commercial **and** collection

[35] This refers to the number of units of bulk purchases (Q) that it will be allowed to recover in retail tariffs. There is a separate regulatory issue of the allowed price (P) for these units. The combination of these two regulatory decisions determines the overall cost of bulk power purchases that the discom will be allowed to recover from its retail customers.

[36] See "Delhi's Power Scandal," *Business Standard*, April 23, 2003.

[37] A general criticism of power sector regulation in India is that the commissions have a tendency to accept annual SEB promises of significant improvements in efficiency that are rarely achieved. But the advantage of this "regulatory game" is that it allows the commission to justify smaller tariff increases.

losses. The AT&C number measures the difference between kWhs supplied to the discom and kWhs realized from retail customers. "Realized" means money actually received from retail customers as opposed to what they were billed. Since there is less than 100% metering some of the kWhs realized have to be inferred by taking the money actually received and dividing it by an average billing rate per kWh. In the case of Delhi this was a small percentage, mostly relating to illegal consumers, and so did not pose a problem. In other states this could become a more serious problem and could lead to gaming arising from the un-metered consumers.

- In setting targets for loss reduction, regulators and governments in other countries will sometimes try to have separate targets for technical and commercial losses. Or they will set a combined target for technical and commercial losses that excludes collection losses. Neither of these approaches was feasible in Delhi because of the absence of reliable metering at the level of individual customers or at distribution substations. Therefore, an alternative approach to measuring losses had to be developed based on available numbers that were considered to be reasonably accurate. The advantage of the AT&C concept is that it is based on numbers that are less likely to be manipulated. As one Indian regulator observed: "There are only two real numbers in the Indian power sector: purchases and collections. The rest is myth."[38]

- AT&C affects allowed tariff levels through a two step process. This is described in detail in Annex C.

- The applicability of this approach to other states must be questioned – as noted above, the need for universal metering means that many states could face problems in applying AT&C without getting into a gaming situation with the operators. Also, the planned introduction of distribution open access will have an impact on the applicability of AT&C. This measure is appropriate for an operator providing both wires and supply services but would need to be reconsidered if just a wires service was being provided.

- Delhi's approach to dealing with the regulatory treatment of losses differs from the typical approach used in Latin American privatizations in two significant ways. First, in Latin America, the loss measure is usually limited to technical and commercial losses and does not include collection losses. This narrower definition of losses requires accurate metering either at the level of distribution substations or at individual meters. Since such metering was not in place in Delhi at the time of privatization, it was not feasible to use this narrower definition of losses. Second, there is no annual measurement of losses for tariff setting purposes in most Latin American countries. While the retail tariff formulas established in the privatization package presume that the discom will achieve a certain annual level of improvement in losses, Latin American regulators do not measure whether the target was achieved on an annual basis. Instead, they measure losses at the end of the multi-year tariff

[38] As quoted in Bacovic, Tenenbaum and Woolf (2003) at p. 48.

period and then only for purposes of setting a new loss improvement trajectory for the next multi-year period. Since losses are such a high visibility concern in India, it probably was politically infeasible to avoid annual measurement of losses in Delhi. Moreover, since Delhi made the decision to create an incentive mechanism keyed to success or failure at meeting annual loss reduction targets, losses obviously had to be measured annually.

Recommendation 5: Loss Reduction Targets

Prior to privatization, establish loss reduction targets using a loss reduction measure that can be accurately measured and which is not susceptible to gaming. Establish the loss reduction targets on a multi-year basis.

Observation: A similarity between the Latin American and Delhi privatizations is that both establish multi-year loss reduction targets prior to privatization. A difference is that Delhi requires that there be annual measurement of whether the company has achieved the target for that year. In contrast, while annual targets are also used in Latin America, there is generally no attempt by Latin American regulators to measure annually whether the targets have been achieved. The principal rationale for the "hands-off" approach in Latin America is the view that the new private company needs breathing space to undertake the improvements and that annual regulatory reviews will hinder rather than help these efforts. In addition, the Latin American countries have generally not adopted annual revenue sharing mechanisms like the one created in Delhi. Instead, the norm in Latin America is for revenue sharing to occur through the setting of new targets at the end of the multi-year period rather than through explicit sharing mechanisms that apply within the multi-year period. In general, the new private discoms in Latin America have achieved remarkable improvements in loss reductions. It remains to be seen whether the Delhi system with annual measurements and explicit within-period revenue sharing will achieve similar results.

Asset Valuation and New Investments

As noted earlier, asset valuation lies at the heart of establishing a sustainable basis, built on financial viability, for private participation in service provision.

Initial Asset Values

- Unlike Orissa, the assets of the Delhi companies were not revalued prior to privatization. The Delhi approach, of shifting to a business valuation to ensure a sustainable level of liabilities was pragmatic and led to the vast majority of liabilities being placed in the state-owned Holding Company – liabilities and assets were shifted between companies rather than being revalued. Prior to privatization, the government in Orissa increased the liabilities of the transmission

and distribution companies by Rs 8,030 million (approximately $180 million). [39], [40] In contrast, the Delhi government reduced the liabilities that would be transferred to the new discoms by about 85 percent.

Recommendation 6: Initial Asset Valuation

When determining the appropriate asset base it is important that a sustainable value be established. This will depend on:

- **the willingness to see tariffs increase in the short- to medium-term; and**
- **expected efficiency savings from the private operator.**

Observation: Underlying this calculation must be a government decision as to whether the aim of privatization is to raise revenue for the government (as was the case in Orissa and Brazil) or to keep prices affordable while introducing incentives for efficiency (as was the case in Delhi and the UK).

Financial Structure

- Answers to the questions posed concerning the adequacy of the equity "buffer" will only be known once the companies have been operating for a couple of years – but the lessons from elsewhere are that unless calls on fresh equity from the operator can be expected or required, a large initial cushion of equity is necessary.

- Three possible non-mutually exclusive reasons can be proposed for the approach adopted in Delhi:
  - it may also be the case that the Government was trying to protect some of the sale value by using debt – long term loans. If a greater equity proportion had been allowed then more of the capital structure could be seen as being 'at risk';
  - alternatively, the Government may have preferred the annual flow of income from debt rather than the immediate cash received from the equity sale; and
  - finally, the Government may have been trying to minimize the upfront cost to investors of taking control of the companies.

New Investments

[39] One possible reason for this could have been the impact of increasing cash-flow from depreciation, of course, this would only work if the regulator accepted the asset value and increased prices accordingly.
[40] Source: Chapter 6, *Unbundling and corporatizing the OSEB* in *Privatization of electricity distribution: the Orissa experience*, TERI, 2003. There were also significant upward valuations in the asset values of the generation companies. The assets of the Orissa Hydro Power Company were revalued from Rs. 364 crore to Rs. 1197 crore. As a result the price of hydro power, which constituted about 40 percent of the Orissa discoms' purchases, went up in price from 20 paise per unit in 1995-96 to 49 paise per unit in 1997-98. One possible argument as to why the assets were revalued upward is that it was a signal to attract investors. Delhi, as the capital of India, was clearly going to attract investors but Orissa was a relative unknown. As such, an attempt to make the deal more interesting to investors might have involved making the size of the deal larger – hence the revaluation of the assets.

- There are two general regulatory approaches for dealing with new investments in a multi-year tariff system:
  1. pre-specify a level of new investments that the regulator will accept over the entire tariff setting period and to automatically reflect the phased-in cost of these investments in tariffs; and
  2. the regulator reviews the need for, and reasonableness of, each investment above some thresh-hold monetary amount, either before or after the investment is made.

  The Delhi regulator like most other power sector regulators in India uses the second approach and performs the review on an annual basis.[41] From the regulator's perspective, it has the advantage of allowing him to retain considerable regulatory discretion over the approval of new investments. From the investor's perspective, it adds delays and uncertainties. In contrast, at the time of privatization in Latin American governments have required that their regulators use the first approach. What this means in practice is that an expected level of new investment for the first tariff period is estimated prior to privatization and the company is not required to get approval for any investments made during the tariff period. Subsequent regulatory reviews in Latin America have generally estimated future investment needs through a "model efficient company" approach that does not require investment-by-investment reviews by the regulator. A similar approach was recommended in Uttar Pradesh and the study that incorporates this approach is available from the Uttar Pradesh Electricity Regulatory Commission.

- In developing and transitional economies it is unlikely that the regulator (and/or Government) will be able to pre-specify all investment that is needed. As such, some form of hybrid approach to investment will probably be needed. Where possible, investments should be pre-specified. Where necessary, additional rules for how unanticipated investment will be handled should be established. These rules should be clear and established prior to any unanticipated investment occurring.

- Many of the alternative investment rules create uncertainty – an *ex post* assessment on a used and useful basis opens the operator to the chance that some, if not all, investment costs will be disallowed. As such, rules should be considered carefully and where possible large unanticipated investments should be pre-agreed with the regulator to remove that element of uncertainty. Of course, this will entail further regulatory costs.

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[41] The licenses for most distribution entities in India typically require that they obtain prior regulatory approval for any investment above Rs. 5 crores (US$ 1 million) and any planned investments must be specified in the mandatory annual revenue requirement filing. In its first post-privatization tariff order, the Delhi commission clearly signaled that it will continue to perform an investment-by-investment review for all investments above the threshold amount. The Commission observed that it "has conducted sample checks on the investments starting from the material procurement process to installation of equipment and issue of completion certificates" and directed that "the Petitioner [the discom]…obtain Commission's approval for all the capital investment schemes." Delhi Electricity Regulatory Commission, "Order on ARR for FY 2002-03 & 2003-04," July ---, 2003, p. 71.

Recommendation 7: New Investments

When determining how to address the issue of investment, considerations relating to the creation of incentives and certainty mean that it is better to be clear *ex ante* as to how much investment is needed to meet the targets rather than be forced into an *ex post* assessment which seems to be likely in Delhi's case. It does appear that indicative capital expenditure plans were provided by the companies (although whether they split investment between loss related and other investment is not clear) but the precise standing of these plans with the regulator is also unclear. What is also important is the interaction between elements of a regime must be clear – for example how will the revenue sharing arrangement in Delhi interact with the incentive for greater loss reduction. This is discussed below.

Observation: There are likely to be cases when it is impossible to pre-determine all investments needed. Some form of hybrid system will then probably be necessary – this will need to weigh up the costs of regulatory interference with the additional risk of uncertainty.

Subsidies

Privatization of distribution raises four basic questions relating to subsidies:

1. Should the government commit to subsidizing the new private company?
2. If the government decides to provide a subsidy, what is the total amount of the subsidy and for how long will it be available?
3. What is the mechanism for delivering the subsidy?
4. Should there be a government guarantee to help ensure that the subsidy will actually be delivered as promised?

- As noted earlier, it was estimated that the Delhi government had already been subsidizing DVB every year by about Rs. 1,500 crores (US$ 315 million) through "loans" that were never likely to be repaid. By now agreeing to provide subsidies to the private discoms through discounted prices on power purchases, the Delhi government was, in effect, taking a gamble.[42] The gamble was that an "investment" in up to five more years of subsidies would eliminate the need for any further subsidies beyond five years. The subsidies were intended to avoid the need for large post-privatization tariff increases. The gamble was that the companies will have reduced losses and become financially self-sufficient by the time the pool of subsidy money funds is used up.

[42] Some have objected to describing these discounts as "subsidies." They would prefer to characterize the discounts as a transition support payment. Their logic is that Transco will pay back its loan to the Delhi government and that Transco will be allowed to recover its repayment of the loan through higher tariffs charged to the discoms. This assumes that the Transco will have sufficient revenues to repay the loan and that the regulator will allow the repayments to be recovered in the Transco's future sales to the discoms. These are two big "ifs." Another uncertainty is whether the discoms would still be willing to buy power from the Transco since the discoms have the legal right to seek alternative suppliers. Given all these uncertainties, we think that it is reasonable to describe these discounts as subsidies.

- In reality, the Delhi government probably had no choice but to take this gamble. The existing gap between revenues and costs was so large that no credible private company would have bid for DVB's assets without some government commitment to a subsidy.[43] And if some private company had come forward and bid without the commitment of a guarantee, the government and regulator would probably have faced considerable pressure to raise retail tariffs to close the cost-revenue gap after privatization to avoid having the discom walk away from its investment (as happened with AES in Orissa). Regardless of when and how the subsidies are delivered, Delhi consumers will ultimately pay for the subsidies either in the form of higher taxes or in reduced government services. But the major political advantage of subsidies is that these costs (higher taxes and reduced public services) are generally not perceived as being connected to the government subsidies. Therefore, it should not be surprising that governments throughout the world are usually inclined to give subsidies to new discoms to avoid post-privatization "rate shocks."

- Almost every recent privatization of distribution in developing and transition economies has involved a government commitment to subsidize the new distribution companies for several years. As in Delhi, the most commonly used mechanism for delivering the subsidy is a discounted price for the bulk power that the discom purchases from government owned generators or transcos (Hungary, Moldova and El Salvador) or from privately owned generators that have purchased a government owned generator but with an obligation to sell power to a discom at a specified price for a certain number or years (Argentina, Brazil and Panama).[44]

- Subsidized power purchases seems to be the delivery mechanism of choice for two reasons:
    1. it is simple to administer because the subsidy is delivered to a single entity rather than to thousands of customers; and
    2. the subsidy is hidden from view.

  It avoids the need for the government to give money directly to the private discom, which would be politically embarrassing in most countries. [45]

- The fact that the Delhi government was willing to give such subsidies to the private discoms channeled through the Transco is a key difference from Orissa. In Orissa, the state government did not provide any post-privatization subsidies to its discoms.

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[43] It was estimated that revenues covered about 70 percent of average costs prior to privatization.

[44] The mechanism used for subsidizing the Baku electricity distribution company in Azerbaijan is very similar to the Delhi approach. The operator, Barmek, a Turkish company, has to pay 50% of the bulk power bill in year 1. This payment then increases to 60% in year 2 and on until in year 6 when 100% of the bill is paid. Technically this is a loan to the distribution company to be repaid over many years once the company is paying the full cost of bulk power. In contrast, the Delhi loan is a loan to the state owned transco.

[45] In addition to the power purchase subsidy to the discoms, the Delhi government announced that it would provide an additional subsidy of Rs. 52 crores to subsidize the tariffs of residential customers who consume less than 400 kWhs per month. The government made the announcement just before the commission issued its first post-privatization tariff order.

In fact, the Orissa government's actions caused the discoms to pay more for power after privatization.

- The key question is whether other states in India have the financial capacity to give such subsidies. Many states are facing major budget deficits that suggest that they will not be able to fund such subsidies. An alternative source of funding would be to seek a loan from a multi-lateral organization to pay for the subsidies.[46] Another potential source of funding would be to require state-owned generators to sell some or all of their output to the new distributors at a price that just recovers their variable cost of generation. If a state opts for this second approach, it has the advantage of avoiding the need for out of pocket payments from the state government. The disadvantage is the state owned generating units will become run down, will probably then suffer reduced availability and will ultimately attract lower prices if the state government tries to privatize them. Also, the level of potential subsidies may be inadequate if a state purchases much of its power from out-of-state suppliers. In these states, it will probably be necessary to use both sources of subsidies.

- The subsidized price in Delhi is **not** a fixed price. Instead, the price paid by the discoms for power purchased from Transco is calculated as a residual using a three step calculation. The steps are:
    1. DERC estimates the amount of revenues that a discom will collect from its customers. This estimate of total revenues is based on the retail tariffs allowed by the commission and the disco's expected sales and collections.
    2. DERC determines the discom's allowed costs excluding power purchase costs. The allowed costs are capital and operating costs for providing distribution and retail supply services. The Delhi government's policy directive required that the discom's capital costs include a 16% return on the discom's invested capital (equity and reserves).
    3. DERC calculates the amount of money that remains to pay the Transco for power purchases. It is this residual amount of money divided by the number of kWhs that the discom is allowed to purchase from the Transco (based on the losses that it committed to achieve in its bid) that determines the price that the discoms pay for power purchases.

Therefore, the price for power is based on the disco's "ability to pay" rather than the Transco's costs of supply.[47] In effect, the burden of the subsidy is shifted back to the Transco which has been mandated to supply power to the discoms at a loss.

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[46] An example of World Bank support for a phased reduction of subsidies is provided by the case of the water sector in Guinea. This is discussed in Chapter 3 of *Contracting for Public Services: Output Based Aid and its Applications*, Brook and Smith, 2001, World Bank.

[47] A similar approach known as the "distribution margin" has been proposed by consultants to the Government of Karnataka. Under this proposal, the payment for power and transmission services provided by power enterprises owned by the state government would, as in Delhi, be a residual. In other words, the discoms would first reimburse themselves for their distribution and retail supply expenses (subject to pre-specified performance targets) and any remaining money would go to GoK suppliers. Arguably, the same thing was done informally in Orissa. The private discoms in Orissa first used their collected revenues to cover their own expenses and, if they had any money left over, they paid the Orissa grid company. In both Delhi and Karnataka, the discoms are explicitly are being given the first "rights" to the retail revenue

- **The design of the Delhi subsidy delivery mechanism raises five possible problems.**

    1. the amount of subsidy received by an individual discom will depend, in part, on its internal operating efficiency. A less efficient discom will be eligible to receive a larger subsidy. As a general principle, it does not seem like a good idea to create a subsidy systems that rewards inefficiency with a higher subsidy. Moreover, there is a second incentive that may exacerbate this outcome. The Delhi discoms can earn higher profits if they beat their annual loss reduction targets. So if they are allowed to pass through all capital and operating costs to beat the annual targets, a discom could gain in two ways: it earns higher profits if it beats its annual loss target and the higher costs incurred to beat the target will lower the price that it pays for power purchased from the Transco. It should be pointed out that the recovery of higher costs is not automatic. DERC has the authority to disallow some of the costs and, in fact, has done so in its first post-privatization tariff order. [48]
    2. the subsidy delivery mechanism requires that each discom's revenue requirement continue to be measured on an annual basis. This is different from the approach used to deliver subsidies in most of Latin America. In Latin America, the subsidized price for power paid by new private is generally fixed and known in advance. [49] In almost all the Latin American privatizations, the amount of the subsidy does **not** depend on the discom's operating efficiency and an annual calculation of a revenue requirement. Instead, government subsidies to discoms are delivered through a "vesting contract" which is, in effect, a power purchase contract assigned to a new private discom with a price that is fixed for several years below prevailing market prices (or full cost recovery). Therefore, unlike Delhi there is no need for Latin American regulators to calculate the subsidized price because it is fixed in a advance rather than calculated annually as a residual.
    3. it is unclear what will happen if the fixed pool of subsidy money turns out to be insufficient to last for the five years of the transition period. Since none of the discoms have asked for a tariff increase in their first year of operation after privatization, it is conceivable that the amount of subsidies promised by the Delhi government may prove to be insufficient. [50] The Delhi government's policy directive is silent on what the government or regulator will do if the subsidy money runs out. In any privatization that involves a subsidy, there is always a risk that the private companies will come back after a year or two and assert that they need a larger subsidy because their costs are higher or their revenues lower than

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stream. In Orissa, they assumed this right on a *de facto* basis by not making payments to the Orissa grid company.

[48] It appears that the Commission disallowed about 31 percent of the discoms non-power purchase expenses in its June 2003 tariff order. See DERC(2003, p.50).

[49] Or alternatively, the pricing formula is fixed by contract. But in both instances, a fixed price or a fixed pricing formula, the price charged to the discom is not influenced by the discom's operating efficiency.

[50] In addition to this subsidy to the discoms, the Delhi government has agreed to provide an additional subsidy of Rs 52 crores to subsidize the tariffs of residential customers who use less than 400 kWhs per month.

anticipated. Governments are naturally reluctant to accede to such requests because they understandably do not want to be in the position of writing a "blank check."

4. there is always a risk that that the Delhi government will fail to provide the subsidy money that was promised. In other words, there is no guarantee mechanism that a future Delhi government will honor the commitment of the previous government. There have been proposals that any government commitment to provide a subsidy be backed up by some type of guarantee. However, such guarantees come with a cost. If the guarantee is made or backed by the Government of India, it will be viewed as a contingent liability and will reduce the Government of India's overall borrowing capacity in international capital markets.
5. there were no publicized annual caps on the subsidies. When the Delhi government informally communicated additional annual caps to the Delhi regulator, it did not publicly announce these annual caps. As a consequence, it left itself open to the charge that the total pool of money available for subsidies would be exhausted in the first two or three years. With the clarity that comes only with hindsight, a better approach would have been to publicly announce both the maximum amount of subsidies for the full five year period as well as the annual cap in each year of the five year period.

Regulation

The Government Versus The Regulator: Who Decides What?

- **The Delhi government stated that its policy directive fell within the realm of policy.** The Delhi government, like most Indian state governments, has the right to issue policy directives to their state regulators. And "policy" can include the elements of tariff setting because tariff setting is not excluded from the definition of policy. But this was a sensitive issue in Delhi because the government did not want to give the impression that it was infringing on the commission's tariff setting authority. Yet, the government's directive required that the commission adopt policies or take actions that were tariff setting in nature because they directly affected the retail tariff levels. For example, the directive specified that the regulator must adopt certain tariff policies such as a specified method for calculating the bulk supply price paid by the discoms, automatic pass through of these power purchase prices and a 16 percent return on a specified capital base. It also required that the Commission set tariffs using certain specific parameters--the loss level improvement trajectories bid by the discoms. Though DERC was still legally responsible for setting retail tariffs, its discretion was clearly limited by the government's directive. [51] And if the New Delhi government decides that

[51] The Commission has clearly accepted the Delhi Government's authority to issue these policy directions. In its first post-privatization tariff order, the Commission stated that: "The policy formulated and Directions issued thereto by the Government of NCT of Delhi in exercise of its power under section 12 of the Act are binding on the Commission. The Commission, therefore, does not have any further view in the matter." DERC (2003, p. 48).

the Commission has failed to implement its directives, it would presumably step in and override the Commission's actions.

Recommendation 8: Subsidies to the New Discom

If a government decides that it must subsidize a disco's power purchase costs, the characteristics of the subsidy delivery mechanism should be specified prior to privatization. Ideally, the subsidy should be :

- **fixed in amount and duration;**
- **independent of the discoms's operating efficiency;**
- **accompanied by some credible guarantee that it will actually be delivered;**
- **independent of annual regulatory determinations;**
- **linked to some measurable event to make the subsidy "output" or "performance" based'; and**
- **encouraging the discoms to seek retail tariffs that recover their costs.**

Observation: The Delhi privatization satisfied only the first of these six criteria. In contrast, the vesting contract approach used in Latin America typically satisfies four of the six criteria: the discom will know the price that it will pay for its bulk power purchases for a specified period of time; the subsidy will not increase if the discom operates inefficiently in the future; it eliminates the need for annual calculations by the regulator that are likely to be disputed and; it creates a strong incentive for the discom to seek tariff increases that will eliminate any pre-existing revenue-cost gap. But even if these conditions were satisfied, there would still be uncertainty that the government will honor the commitment to sell at a subsidized price. Another subsidy delivery alternative (which has been discussed in Andhra Pradesh) is to fix each discom's annual power purchase price as a specified percentage of the Transco's annual bulk supply tariff. The percentage, which would be fixed on a one time basis, prior to privatization, would vary across discoms. It could be lower (e.g. 85% of the BST) for a discom serving a less desirable service area and higher (e.g., 115% of the BST) for a discom that has a more favorable service area. However, a disadvantage of this approach from the perspective of the discoms is that if the BST goes up significantly, this will place a financial squeeze on the discoms unless there is full and timely pass through of these higher power purchase costs in the discom's retail tariffs.

The 2000 Delhi Electricity Reform Act gives the Delhi government wide latitude to issue policy directives to the regulator that cover tariff matters. The Delhi government had a legal right to issue a policy directive that dealt with tariff matters. This seems to be generally true in other Indian states as well though this may change with the passage of the new Electricity Law. As a general proposition, we think that state governments should have tariff setting authority if it is on a one-time basis and exercised in conjunction with a privatization transaction. Our reasoning is that the state government will be in ongoing discussions with private investors and the state government, therefore, is in a better position than the regulator to know the elements of a tariff regime that are necessary to achieve successful privatization. Indian regulators, who give more

emphasis to their "quasi-judicial" role than their counterparts in other countries, seem unwilling to participate in such discussions with potential private investors, possibly out of the reasonable concern that it will raise concerns about their independence.

- **In many countries that have successfully privatized distribution, the government will openly and completely specify the entire tariff setting regime for the first multi-year tariff setting period and with fairly detailed principles and procedures for setting tariffs in subsequent multi-year tariff periods**. What the Delhi government did in its policy directive is actually the norm in many countries that privatize distribution. In these countries, when a government privatizes its distribution assets, it is the government and not the regulator that establishes the tariff setting system that will apply to the new distribution companies. Usually, the government establishes both the general tariff setting system as well as the formulas and actual values of tariff parameters for the first tariff setting period. And the government does this prior to privatization. There is no expectation that the regulator will perform these tasks because the regulatory agency usually does not exist until privatization occurs. After the government creates the tariff system, it is handed over to the regulator to administer. One important implication of this approach is that it is clear that the tariff setting system and the specific formulas and values for the first tariff setting period are legal commitments of the government because they are included as specific provisions of the privatization agreement and in the license or concession agreement that accompanies the privatization agreement.

- **While the worldwide norm is that a government will create the tariff system that it believes is needed for successful privatization and the regulator administers this system, this approach poses some problems for India.** With the encouragement of the World Bank, state electricity regulatory commissions have been created in 12 states.[52] Moreover, these commissions have operated, until recently, under a statute that clearly promoted tariff setting based on an annual cost of service review rather multi-year tariff setting. While these commissions have had some success in establishing transparent regulatory regimes, they have had less success in getting the government owned enterprises to comply with their tariff orders.[53]

  State governments are now in an awkward position if they wish to privatize and have concluded (as did the Delhi government) that the existing tariff policies of their state regulatory commission are an impediment to privatization. It is understandable that a state government will not want to give the appearance that it is infringing on the tariff setting responsibilities that had been previously granted to the state regulatory commission. The solution, in our view, is to modify existing statutes to give state governments the option to establish, on a one

[52] It was thought that the new commission would regulate the state owned power enterprise for a short period prior to privatization but, as privatization has been delayed or taken off the table in many states, the commissions find themselves with the difficult task of trying to regulate state owned enterprises.
[53] Prayas (2003), p. 29, 52, 78-79

time basis, the tariff setting system that they believe are necessary to attract private investors while protecting consumers.

This may seem like a strange recommendation when so much time and effort has been spent trying to get governments out of the business of setting electricity tariffs. This recommendation seems to go in exactly the opposite direction. It is true that it would give state governments the opportunity to set up a tariff system, an opportunity that is currently not available to them. We think that this option needs to be made available because the state government will usually be more sensitive than the regulator as to the tariff elements required to attract private investment. And the key distinction is that this involvement would be a one-time action rather than an ongoing involvement. It might be argued that this would compromise the independence of the existing state electricity regulatory commissions. We think not. If there is any one lesson learned from other developing and transition economy countries, it is that the fact that a regulator is "independent" does not imply that the regulator must establish the tariff setting system that it independently administers. The real world experience in almost every instance of successful distribution privatization is that the government establishes the initial tariff system and the regulator administers it. We think that state governments in India should have access to the same policy option.

This is not, however, the only viable solution. Where regulatory commissions have been established and are willing to introduce a multi-year tariff framework, it may be possible for the State Government and the regulatory commission to work together in creating an environment that is conducive to private investment. This approach was adopted recently in the attempt to privatize KESC in Pakistan.[54] In our view, the proposed National Tariff Policy envisioned in the Electricity Act 2003 provides a golden opportunity for the Government of India to explicitly promote one or both of the approaches. Then individual states could decide which of the two options is more appropriate for their circumstances. Given the importance of this issue it is surprising that the draft NTP provides no guidance to the States.

The Delhi Government Policy Directive: Was It Sufficient?

The Delhi government directive established a partial multi-year tariff setting system. It is "partial" in the sense that only some of the performance elements (loss improvements) and cost elements (bulk supply costs) were specified on a multi-year basis prior to privatization. However, other elements such as operating expenses and capital expenses will continue to be reviewed and approved by the regulator on a

[54] In March 2002, the Ministry of Water and Power on behalf of the Government of Pakistan issued a guideline, as allowed under the 1998 Tariff Rules, that proposed to the National Electric Power Regulatory Authority (NEPRA) that tariffs could be fixed on a multi-year basis for a privatized Karachi Electric Supply Corporation. This proposal was reviewed by NEPRA and accepted on the grounds that it would facilitate privatization. NEPRA proposed a seven year tariff regime. This review and the original guidelines provided are discussed in Tariff Determination in Case No. NEPRA/TRF-14/KESC 2002. NEPRA's tariff order and KESC's submission are available on the NEPRA website (www.nepra.org.pk).

year-to-year basis using general criteria rather than specific formula. The policy directive is silent about how DERC should conduct these reviews. It is also "partial" system in another respect. Two key regulatory elements, the distribution and retail supply license and quality of service standards, were not specified prior to privatization.[55] Yet these, too, are critical elements of any regulatory system. Therefore, although the Delhi system is an important first step towards a multi-year tariff system and is a clear improvement on what happened in Orissa at privatization, it is still an incomplete system.[56]

[55] This is not totally true because the Delhi discoms inherited a license that previously applied to DVB. But it was widely recognized that this license was too general to be useful in regulating the three new discoms. Therefore, in August 2002 DERC initiated a proceeding to create a new license for the discoms. In other countries, the license is almost always in place prior to receiving bids so that potential bidders will have a clearer idea of their rights and obligations.

[56] Some of this lack of completeness appears to already be having an impact. The regulator's first tariff order after privatization rejected a provision for the recovery of deferred tax liability, significantly reduced the allowed rate of depreciation and disallowed a significant share of the discoms' operating expenses. Under a more complete multi-year tariff system, these tariff setting issues would have been pre-specified at the time of privatization.

Recommendation 9: State Government's Initial Regulatory Authority[57]

If the state government thinks it is necessary, amend the existing state electricity reform act to give the state government the clear legal authority to establish on a one time basis a complete multi-year tariff system to promote privatization. Once the system is established by the state government, it should be administered by the state regulatory commission.

Observation: When the state government believes it must create the specifics of a regulatory system in order to create an environment conducive to private investment, it must be explicitly granted this authority by law. The alternative would be for the state government to try to create some, or all, the elements of the regulatory system through a policy directive (the approach taken in Delhi). The obvious problem with this approach is that policy directives can always be changed by the next government. As a consequence such directives do not have a high degree of credibility with private investors. In our view, a better strategy for India would be for the President of India to give his assent to any state that wishes to amend its existing state electricity reform acts to give the state government the explicit authority to establish on a one time basis the tariff system that the state government believes is needed to achieve sustainable privatization.

The fact that this legal authority would be granted to the state government does **not** mean that the state government would necessarily have to exercise the authority. For example, a state government may choose to hand over the responsibility for creating such a tariff system to its state regulatory commission where the commission, on its own initiative, is already moving to create such a system. This appears to be the case in Andhra Pradesh and Orissa. But even in these situations, there will still be a cloud of legal uncertainty. The recently enacted Electricity Act 2003 provides greater opportunities for pricing than were afforded under the 1948 Act. However, the impact of the Electricity Act 2003 in this area will depend on the National Tariff Policy (NTP) that is yet to be finalized. The initial draft of the NTP offers little development of the pricing rules and through the specific figures for items like the return on capital it actually seems to provide even more prescription than the previous acts. As long as legal and policy uncertainty exists, India will be at a competitive disadvantage in attracting international capital relative to the many other countries that have clearly given this authority to their governments.

- **It is a shared regulatory system**. In the first post-privatization tariff setting period, there are effectively two regulators: the Delhi government through its policy

[57] One issue that arises is whether the State Government should be able to provide a new initial phase if a privatization were to fail. For example, when CESCO in Orissa is resold, would it be appropriate for the Government of Orissa to provide a new settlement to make the resale easier? The answer to this is far from clear and depends in part on the causes of the failure of private sector participation. It is probably better handled through ad hoc arrangements between the Government and the regulator rather than mandating that one or other of the agencies would always take the lead in this type of situation. Major renegotiations of contracts should also be treated this way.

directives and DERC through its annual review of operating expenses and capital expenditures. However, the Delhi government's policy directives did not give any policy guidance on how to integrate operating expenses and capital expenditures with the tariff elements specified by the government. It is conceivable that the Delhi government could step back in and issue a new directive if it does not like what DERC is doing. But this would be an awkward situation that could lead to unnecessary conflicts between DERC and the government in the future. In our view, the better approach would be to pre-specify all (rather than just some) of the major tariff setting policies in advance of privatization. This has been the norm in most of the successful Latin American disco privatizations.

- **It is a temporary system that disappears after five years.** Unless a future Delhi government issues a new policy directive, the tariff setting system will revert back to the annual cost of service approach embedded in current Indian law at the end of the transition period. At the end of the five years, it appears that there is nothing to preclude DERC from making major adjustments in numbers that would affect tariffs. For example, DERC could suddenly shift from an allowed 40% loss to 20% loss in setting tariffs in year 6. A good regulatory system must make provisions for continuity in regulatory policies beyond any initial tariff setting period. This has not been done in Delhi and therefore the tariff setting system runs the risk of "falling off a regulatory cliff at the end of five years."

- **The Ministry of Power could commission model documents**. It must be acknowledged that implementation of this type of comprehensive checklist can be difficult. The problem is that once a government decides to privatize, there is often political pressure to do it as quickly as possible. Consequently, there may not be enough time to prepare all the regulatory elements in the above checklist. The new Electricity Act gives the national government the clear authority to establish tariff guidelines in a new NTP. But, in addition to these guidelines, it might also be useful if the Ministry of Power commissioned model (though non-binding) documents covering the key items in the regulatory checklist that would then be available to state governments. There are precedents for this approach in other countries. For example, the French government has promoted the creation of a "model" concession document to facilitate private sector participation in the water sector. While the document is not binding on municipal governments, it has effectively become the "de facto" model for such agreements.

Recommendation 10: Establish A More Complete Regulatory System

Prior to privatization, the all major components of the regulatory system that will apply to the new private discoms should be specified. A checklist would include:

- **A well-specified retail and distribution supply license that clearly presents the discom's rights and obligations.**
- **Initial values and targets cost and physical parameters for the first multi-year period established either through bidding or negotiation.**
- **Specification of controllable and non-controllable costs and the tariff treatment associated with these different types of costs (especially the pass-through rules for different power purchases).**
- **Procedures for adjustment and true-up of costs.**
- **Any within-period or end of period profit or revenue sharing mechanisms.**
- **Specification of technical and commercial quality of service standards that will be required in the initial and later multi-year periods and the penalties associated with these standards.**
- **The level of subsidies that will be available to the discoms, how the subsidies will be delivered and what recourse is available to the discoms if the government fails to deliver the subsidies that it promised.**
- **Nature of the obligation (quantity, price and duration of the obligation) of the discoms to buy from a government transco or generators and the obligation of these government owned entities to sell to the discom.**
- **Division of service responsibility between the discom and decentralized electricity service providers such as coops, village electricity committees and small private entrepreneurs.**
- **Principles and procedures that will apply to resetting tariffs at the end of the first multi-year period and in future tariff periods.**
- **A statement of the conditions or schedule for the introduction of retail competition.**
- **An efficient and fair dispute resolution mechanism if the licensee disagrees with the commission's implementation of the regulatory system. (The creation of a specialized appellate court in the recently passed Electricity Act (2003) should establish a much improved platform for dealing with regulatory disputes than the previous reliance on regular courts.)**

Observation: No contract is ever complete. This is true of commercial as well as "regulatory" contracts. It is inevitable that that there will always be unanticipated events and ambiguities around the edges of the words. But even if one accepts these realities, it is clearly possible to specify more of the regulatory system than was done in Delhi.

The lack of completeness in the Delhi tariff setting system is already having an impact. DERC's first post-privatization tariff order rejected a provision for the recovery of deferred tax liability, significantly reduced the allowed rate of depreciation and disallowed a significant share of the discoms operating expenses. We will not attempt to make judgments about the merits of the commission or companies' position. But if there had been a more complete multi-year tariff system, these tariff setting issues would

have been resolved at the time of privatization and the disputes would probably not have arisen. The need for a more complete multi-year tariff setting system is neither radical nor theoretical. More complete multi-year tariff setting systems than the one used in Delhi have been adopted or proposed in virtually every major distribution privatization in Latin America, Eastern Europe and Africa. Other Indian regulators have reached the same conclusion. For example, the Andhra Pradesh Electricity Regulatory Commission has proposed a detailed multi-year tariff setting system in its guidelines for long-term setting principles issued in March 2003. However, the Andhra Pradesh commission makes it quite clear that the *quid pro quo* for a multi-year tariff system must be clear quality of service standards that can be monitored and which trigger penalties so that both investors and consumers benefit from the new system.

Revenue Sharing

- Utilization of sharing systems should be handled carefully.[58] By adding another layer of rules to the regulatory regime, sharing systems provide opportunities for regulatory gaming. By lowering the return to the company, they also blunt incentives. Key questions that should be addressed when thinking about including a sharing system are:
  - Is it appropriate – do the concerns of 'excess' profits etc. outweigh the costs of implementing a sharing system?
  - What type of sharing is to be used – profit or revenue? Each has advantages and disadvantages.
  - What are the implications of using the sharing system – what types of regulatory gaming might occur, etc?

- The sharing system that has been established is simple – an advantage over many other systems. This asymmetric sharing would seem to provide:
  - some incentive for the operators to reduce losses faster than established through the bidding for loss targets; and
  - protection for the Government inasmuch as the benefit of under-stating the potential loss reduction that could be achieved is only 50% of revenue.

- However, what is not clear is:
  - whether an allowance of 50% of revenue over a maximum of five years is sufficient incentive to reduce losses; and
  - what happens to these savings at the end of the five years, do all savings then transfer to consumers?

- Since the number of bidders for the companies was low, implying the degree of competitive pressure to reduce losses may not have been as great as would be desired, the inclusion of the revenue sharing arrangement should help limit any fall-out arising from excessive profits for the operators. Addressing this concern may have also

[58] It is not appropriate to review the arguments concerning sharing mechanisms in this paper. A summary of the issues relating to sharing are provided in Alexander and Harris, 2001.

helped explain why the system was made more complex by including the no-sharing band between the negotiated level and the original minimum targets. But why choose revenue sharing rather than more accepted approaches such as profit-sharing?

- Revenue-sharing should:
  - be simpler to implement since it abstracts from the problems of defining and measuring profit (this is especially true since the sharing is limited to the loss question rather than an expansion of sales through new connections etc); and
  - be easier to explain to consumers.

- Further, since all revenue arising a greater reduction in losses is effectively "profit" there is really little difference between operating a revenue-sharing or a profit-sharing system (but this arises because the system is focused on incentives for losses rather than general incentives for the company).[59] Of course, if costs are incurred to achieve the loss reduction then this analogy does not hold (provided that the costs are not captured in the regulatory cost base).

- An issue that does have to be addressed, however, relates to the way that investment for losses should be treated. Incentives for loss reduction should be thought about in two ways:
  - those necessary to achieve the loss targets – which will probably require a mixture of positive incentives for allowed investment to meet the targets and penalties for failure to meet the targets (the risk to the revenue stream of the company); and
  - additional incentives to achieve better than targeted loss reductions – these are likely to focus on revenue impacts of loss reduction rather than the investment necessary. This approach is simpler since it leaves it to the operator to determine whether the revenue saved from reducing losses (and earned if those savings can then be sold) is sufficient to justify the investment necessary to make the savings.

[59] This situation arises because the cost of the bulk power is already included in the revenue calculation (as part of the losses) and the marginal cost of the distribution system is close to zero for existing consumers. Consequently, any revenue generated by additional loss reduction is equivalent to profit.

Recommendation 11: Sharing Mechanisms

Ensuring political acceptability is important. When significant uncertainty exists about cost elements for which incentives are being created some form of protection for both the operator and the government is necessary. A sharing mechanism of some type offers a solution. Decisions have to be taken as to:

- **the form of sharing;**
- **possible perverse incentives and regulatory gaming that might be created;**
- **whether the system is symmetrical; and**
- **the details of the system, for example, the degree of sharing, the bands for sharing etc.**

Observation: Delhi's approach clearly tries to address some of the concerns arising from the lack of information but also creates some opportunities for gaming which the regulatory commission will need to be aware of during future price reviews. For example, depending on how revenue is counted (when billed or collected?) this could provide some incentive for timing of collections at the end of a financial year. Further, the complexity created by including the no-sharing band could make this intuitively simple approach much more difficult to apply.

Conclusions

While it is still too early to say that the Delhi privatizations have been successful, it seems clear that the design of the Delhi privatizations improved significantly on that utilized in Orissa. The key improvements were in three areas: (i) a more sustainable initial valuation of the enterprises that were to be privatized, (ii) a clear government commitment to provide financial support to the discoms through subsidized power purchases during a five year transition period and (iii) a better specified multi-year tariff setting regime based on more realistic loss targets that can be more accurately measured. The recently enacted Electricity Act (2003) will help to build a legal platform for further reforms elsewhere in India by making it clear that state regulatory commissions have the legal authority to establish multi-year tariff systems and by creating a specialized electricity tribunal to adjudicate regulatory disputes in the power sector and.

Within India, both the Delhi and Orissa privatizations are special cases in that neither jurisdiction had to deal with significant sales to agricultural users. Sales to agricultural users have been a major stumbling block to privatization in other states because agricultural users are heavily subsidized and almost always oppose any reforms that might reduce or eliminate their subsidies. *Despite this key difference, many of the privatization techniques used in Delhi, which were improvements over Orissa, could be used with further refinements in future privatizations in India and elsewhere.* And since the focus of the paper is on the privatization process and the accompanying regulatory system, many, if not all, the recommendations would be equally applicable to future Indian privatizations that involve rural as well as urban areas.

However, it would be naïve to expect that a series of technical and regulatory improvements will produce sustainable discom privatizations. No privatization will be sustainable unless there is serious ongoing political support for the privatization and the new discoms can become economically viable without subsidies after no more than four to five years. *Good performance at the transaction stage is no guarantee of a sustainable privatization.* No privatization will be successful unless post-privatization governments pay the subsidies that were promised, ensure that government entities pay their electricity bills and support basic law and order by enforcing serious anti-theft provisions. A long time observer of power sector in other countries once remarked that the true test of the seriousness of a government's commitment is whether it is willing to prosecute rich people and members of its own political party who steal electricity.

Similarly, the privatization and regulatory reforms recommended in this paper will not matter very much unless the underlying economics of the discom become viable. Specifically, this means that the discom must be able to make a profit within four or five years after privatization. *In any country like India where the starting point are tariffs that do not cover costs and unconscionable levels of technical and commercial losses, any privatization will ultimately be a race to achieve economic viability before any government provided subsidies run out.*

We think that further improvements on the Delhi model are possible. In particular, there is a need to develop a more complete specification of the tariff setting system setting system prior to privatization. This would require specifying a multi-year system for operating expenses and new investments rather than relying on year-to-year determinations by the regulator as practiced in Delhi. It would also entail better specification of technical and commercial quality of service standards that the discoms must satisfy. In addition, better mechanisms have to be developed for how subsidies are delivered to new discoms. The experience of other developing countries in using multi-year vesting contracts could be adopted in India. The best overall strategy would be to specify, as much as possible, regulatory rules in a license that is available prior to privatization so investors, whether Indian or foreign, will have a clearer understanding of their rights and obligations. *The Ministry of Power could help in this effort by developing a non-binding, model discom license that would be available to states that are serious about privatizing distribution.*

The Delhi experience also suggest that there is a need to specify what will happen at the end of the 'transition' period. Implicit in the Delhi transaction is a five year barrier – once the period covered by the AT&C trajectory agreed to at privatization is completed, what will be the new tariff setting system? Some of this may become clearer in the Delhi regulator's annual tariff determinations, the first of which has now been completed and which was partly controlled by the Government's policy directive. But investors need to have greater comfort as to what will be the tariff setting system after this first five year period. This certainty can either be created through a policy directive or by ensuring appropriate obligations are imposed on the regulatory commission through the amendments to the existing reform acts. We think that the second approach is superior since policy directives (even if they can deal with tariff setting which is now uncertain under the new Electricity Act) can always be changed by future governments. In this respect, there is much that can be learned from the Latin American experience. Within Latin America, there have been more than 50 (mostly) successful privatizations of electricity distribution. *The common feature of the successful privatizations is a law accompanied by secondary regulations that lays out the principles and sometimes the details of the tariff setting system for the initial, as well as later, post privatization tariff setting periods.*

Two other issues that should have been given further consideration in the Delhi transaction were:

- the uniform tariff post-2007; and
- the impact of the expiry of the subsidy.

These two aspects could have significant impacts on the distribution companies, especially the financially weaker one. Again, it seems that a precipice has been established five years out and investors were being asked to purchase on good faith. This may help explain why only two local companies were willing to bid on these transactions. As a general rule, national companies are more willing to invest in situations "where key details haven't been spelled out." *If India is serious about attracting international investment, it will have to do a better job of specifying key regulatory and policy decisions.* The NTP envisioned by the new Electricity Act

provides a unique opportunity for the Government of India to give guidance on some if not all these issues, especially relating to what happens at the end of transition periods.

It is also important in India and elsewhere to clarify the relative roles of state governments and state electricity regulatory commissions. We fully support the need for independent regulatory commissions. However, *a lesson learned from other countries that have successfully privatized distribution is that "regulatory independence" does not necessarily imply that the regulator must establish the tariff system that it is independently administering.* The experience of Latin America suggests that Indian state governments should have the option of establishing a tariff setting system for a first multi-year period that would then be administered by an independent state regulatory commission. The rationale for giving a state government this option is that it will usually be in a better position to know what is required for sustainable privatization than a regulatory commission that is operating as a "quasi-judicial" entity. However, once the principles have been enunciated and the details established for the first multi-year period, then actual implementation should be turned over to the independent regulatory commission and the commission must administer the tariff setting system in an impartial and transparent manner. Building on the Delhi experience, this approach is currently being considered in Karnataka.

What will be important is how this transaction plays out over the next couple of years. The Delhi model seems to have created a credible base for private sector participation. However, we say this with some caution since that was also the general feeling in the period immediately after the Orissa privatization. Whether the rules that were established at privatization are followed and how the regulatory commission undertakes the annual tariff reviews will be critical to the success of the Delhi model. Also, how the five year 'precipice' is handled will be key. Until these events have occurred it will not be possible to determine whether Delhi has been a success.

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Appendix A. Chronology of the Delhi Privatizations

February 1999	Delhi Government issues strategy paper outlining its intention to unbundled DVB, create an independent regulatory entity, and privatize distribution while protecting employee interests.
May 1999	Establishment of the Delhi Electricity Regulatory Commission (DERC). The Commission was initially created under an act of the Central Government and then later notified under the state reform act.
October 2000	Formalization of the strategy through the issuance of the Delhi Electricity Reform Act as an ordinance. In March 2001, the ordinance was given a stronger legal foundation through conversion into an act.
	Tri-partite agreement between DVB, its employees and the Delhi government that protects the employment and pension rights of the employees.
February 2001	Privatization process began with the Request For Qualification.
May 2002	Six bidders were found to be qualified and place on a short-list of potential bidders.
November 2001	Delhi Government issues Request for Proposals. Delhi Government issues a Policy Directive. Delhi Government announces the transfer scheme.
February 2002	DERC issues an order that specifies opening loss levels and the initial Bulk Supply Tariff for purchases made by the discoms from the Transco.
April 2002	Bids were received.
	The Cabinet of the Delhi government considers the bids to be unacceptable “in present form” and creates a “Core Committee to explore alternatives including negotiation.
June 2002	Privatizations documents were signed with BSES and Tata.
July 2002	Date of privatization.
June 2003	DERC issues first post-privatization tariff order.

Appendix B. A Comparison of the Orissa and Delhi Privatizations

Feature	Orissa	Delhi	Observations
Form Of Privatization	Joint Venture—Sale of 51 % of Equity	Joint Venture—Sale of 51 % of Equity	Sale of 51% of the equity was done to ensure management control by the new private owners. But there was a big difference in corporate governance between Delhi and Orissa even though the percentage of ownership transferred to private owners was the same. In Orissa, a government official is chairman of the board. In Delhi, the chairman is appointed by the new private owners. In Orissa, the government has the final say if there are disputes among stockholders. In Delhi, such disputes would go to a court of law.
Pre-Privatization Commitments To Employees	Tri-partite agreement between govt, govt-owned enterprise and enterprise employees that provided employment protections to existing employees	Tri-partite agreement between govt, govt-owned enterprise and enterprise employees that provided employment protections to existing employees	Needed to reduce the opposition of existing employees to privatization but diminishes the ability of the new enterprise to make management changes that reduce losses and enhance quality of service.
Form of Bidding	Investors bid a price for 51 % of equity	Investors bid a 5 year trajectory of commercial and technical loss reductions	In Delhi, the final bids were negotiated because there were an insufficient number of bidders.
Timing of Corporatization	Corporatized prior to privatization	Corporatizated at privatization	
Asset Valuation	Govt increased regulatory capital base.	Govt reduced the asset base by 85 percent	Gov't's key strategy question: Should it try to maximize the price it receives for the equity it sells or accept a lesser amount that will increase the chances that the privatization will be successful?
Pre-privatization Liabilities		Gov't created a	In Delhi, it is not clear how the gov't will deal with the

Feature	Orissa	Delhi	Observations
		relatively clean balance sheet by retaining liabilities in a gov't owned holding company	liabilities that are now "parked" with the Transco.
Form of Tariff Regulation	Annual cost of service with considerable discretion for the regulator	Mix of annual cost of service with pre-specification of some tariff elements (loss reduction trajectory and price paid for power purchases)	Delhi created a partial multi-year tariff system. This could be improved by creating a complete multi-year tariff system created by the government as part of the privatization process. The norm in most Latin American countries is a complete multi-year tariff system created by the government as part of the privatization package and then administered by a newly created regulator.
Specificity of Overall Regulatory System (Tariff and Non-Tariff Regulation)	Low	Medium	Could be improved by specifying prior to privatization: • The distribution and retail supply license • A complete multi-year formula system for retail tariffs. • Technical and commercial quality of service standards. • Schedule for introducing retail competition.
Measurement of Losses	Keyed to the measurement of technical and commercial losses	Keyed to the measurement of technical, commercial and collection losses.	It appears that the narrower loss measure used in Orissa was more susceptible to manipulation. The broader measure used in Delhi appears to be less susceptible to gaming because it is based on two relatively "hard" numbers: kWhs purchased by the discom and monies collected from their customers
Subsidies to Discoms	None	Gov't committed about USD $720 million to subsidize the discoms' power purchases from the govt owned Transco.	This is the most common way for a govt to provide subsidies to a newly privatized discom. The subsidy is usually delivered through a power purchase agreement or a bulk supply tariff. There are no out of pocket costs to government if the it commits to selling at subsidized price from its own generating facilities. But if some of the power supplies are coming from generating facilities not owned by the govt, it will incur out of pocket costs.

Feature	Orissa	Delhi	Observations
			About 80 percent of the Delhi Transco's supply sources are acquired from generating sources not owned by the Delhi government.
Support for Collections and Timely Prosecution of Thefts	Low to Medium	Low	This requires adoption and enforcement of strong anti-theft legislation. Among Indian states, Andhra Pradesh comes closest to meeting these two conditions.
Ability to Collect For Electricity Sold to Government Customers	Low	High	The Delhi discoms can disconnect government customers that do not pay their bills and they can also withhold payments on their loan from the government Transco for non-payment of electricity bills by Delhi government entities.

Appendix C. Major Risks For Distribution Companies

Table 3. Major Risks for Distribution Companies and their Lenders { TC "Table

Risk	*Explanation*
Collection Risk	Risk that the company will be unable to collect its allowed revenues. This might occur for one or more of the following reasons: customers refuse to pay their bills, customers tamper or disconnect meters, company employees receive bribes to make illegal connections or under collect metered or billed amounts, and government officials or courts are unable or unwilling to support disconnections or other actions against non-paying customers.
Power-purchase Risk	Risk that the company will not be allowed to charge tariffs that recover the cost of its power purchases. This could occur if the regulator disallows the prices paid or the quantities purchased.
Demand Risk	Risk that the quantity of electricity sold is less than the amount projected by the company or the regulator in setting tariffs.
Obligation-to-Supply Risk	Risk that the company will collect lower revenues and/or pay penalties because it is unable to meet supply obligations specified in its license or concession. The company's failure to supply may be caused by its own actions (e.g., poor transformer maintenance), actions of others (e.g., inadequate generation or transmission capacity) or acts of God (e.g., a major drought).
Operating Cost Risk	Risk that the company will not be able to recover the costs of operating its distribution system (i.e., the "wires" function) or the costs of retailing electricity (i.e., the supply function) either because the regulator disallows certain operating costs or sets unrealistic performance targets. The allowance for some technical and non-technical losses is sometimes included as operating costs.
Capital Cost Risk	Risk that the company will not be able to recover its capital costs because the regulator sets a low allowed capital base, disallows costs of certain capital expenditures, or sets low rates of return.
Inflation Risk	Risk that company's tariff will not be adjusted for general inflation.
Foreign Exchange Rate Risk	Risk that the company will not receive sufficient revenues from its customers to pay for costs incurred in "hard" currencies.
Foreign Exchange Convertibility Risk	Risk that the government will not give the company access to sufficient foreign exchange to repatriate earnings and to pay for costs incurred in other currencies.
Financing Risk	Risks related to the financial risks borne by entities that have lent money to the company.
Regulatory Risk	Risk that the regulator will reinterpret existing regulations or create new ones that will increase costs or reduce revenues.

Source: Bacovic, Tenenbaum and Woolf (2003, p. 29)

Appendix D. AT&C Losses and Tariffs

Step 1—Calculation of AT&C

a. The Formula

$$AT\ \&\ C = 1 - \left[\frac{Energy\ Units\ Billed\ \ To\ Discom\ \ Customers}{Energy\ Units\ Purchased\ \ From\ Bulk\ \ Suppliers} \times \frac{Collection\ in\ Rupees}{Billing\ \ in\ Rupees} \right]$$

b. Sample Calculation for North Delhi Power Limited (January 2003)[60]

$$AT\ \&\ C = 1 - \left[\frac{219}{442} \times \frac{87}{91} \right]$$

$$AT\ \&\ C = 1 - [.495 \times .956]$$

$$AT\ \&\ C = 1 - .473 = .527$$

The first term in the formula, which is measured in physical units, represents technical and commercial efficiency. The second term, which is measured in monetary units, represents collection efficiency. The product of these two terms is a pure ratio. Concepts similar to the AT &C concept have been adopted in other countries. For example, in a Nigerian micro-privatization, the performance fee earned by the new management is tied to a performance measure which is the product of a "Billing Ratio" and a "Collection Ratio" [which are also the same terms used within the brackets in the Delhi formula]. A similar concept called the "cash recovery index" (CRI) has been proposed in the Dominican Republic.

Step 2—The "gross-up" calculation

a. The Formula

$$Allowed\ Units\ of\ \ Bulk\ \ Power\ \ Purchases = \frac{1}{1 - AT\ \&\ C}$$

b. Sample Calculations of Gross-Up Factor

AT&C = .5

$$Gross\ Up\ \ Factor = \frac{1}{1 - .5} = \frac{1}{.5} = 2$$

AT&C = .3

$$Gross\ Up\ \ Factor = \frac{1}{1 - .3} = \frac{1}{.7} = 1.42$$

[60] These numbers appear in NPDL's March 2003 filing with the commission.

- The gross-up calculation determines the number of units of power purchases that will be allowed in calculating the costs that determine the allowed revenues for purposed of setting tariffs. The gross-up calculation does **not** affect the price that will be charged for these allowed units of power purchases. As described below (see "Subsidies" section), the allowed price for power purchases is fixed through a separate calculation that calculates price as a residual after all non-power purchase expenses are subtracted from allowed revenues. The product of these two calculations, the gross-up calculation for quantity (q) and the residual calculation for price (p), determines the overall allowed costs (p x q) for power purchases, which constitutes 60 to 80 percent of the total costs for a typical discom in India. The percentage of overall costs attributable to power purchases is higher in India than in most other countries because loss levels of publicly owned power enterprises are so high. The issue of how to establish regulatory norms for the pass through of power purchase prices will be the subject of a forthcoming World Bank discussion paper. See Arizu, Maurer and Tenenbaum (2003).