



# Impact assessment of the Electricity Act 2003 on the Indian power sector

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## Abstract

This paper analyzes the likely impacts of the major policy reforms unveiled by the Government of India for revamping the country's power sector. The provisions of the new enactment have recently come into force and seek a paradigm policy shift in the form of the Electricity Act 2003. The paper details out the key features of the Act and the likely power industry changes being brought about in the new regime. These changes comprise the structural changes in the power industry as well as the policy issues related to generation, transmission and distribution of power. Also discussed are the other major areas where transformation is sought and impacts are expected: power trading, role of regulator in the new regime, issue of open access, empowerment of the consumers and the environmental issues.

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## 1. Introduction

The Indian Electricity sector remained a complete State monopoly with social objectives till the year 1991. The social objectives did help to serve the under-privileged domestic and the agricultural class but the results were undesirable in the long run as continued cross subsidies spelled disaster for the overall economy. The electricity prices rose in the industrial sector that bore the brunt of the subsidies provided to the domestic and agriculture sectors and by 1999–2000 the tariffs for the industrial sector became 15 times that in the agriculture sector and 2.1 times that in the domestic segment (Planning Commission, 2002a), forcing the industry to set up its own captive power plants. This resulted in dwindling power sales to the industrial sector (Industrial consumption going down from 67% in 1960 to 40% only by 1991 (TERI, 1993) and to nearly 30% by the year 1998–1999 (Planning Commission, 2002a)). The result was that the State Electricity Boards accumulated huge losses (Fig. 1) as the recovery of

average financial cost of supply through average revenue realized has declined from 76.7% in 1996–1997 to 68.58% in 2001–2002. In 1995–1996 while 9 of the 19 SEBs incurred losses, by the year 2000–2001, all of them were in the red (IEA, 2002). SEBs were increasingly unable to pay for the electricity they purchased from the central public-sector power companies, or from independent power producers (IPPs). This coupled with the policies such as unmetered charges in agriculture (flat rates charged based on pump capacities) and often in the domestic sectors coupled with large scale thefts, resulted in deteriorating O&M status reflected in mounting T&D losses that became very high (Fig. 1). The power supply position as on March 2002, indicated a peak deficit of 12.6% and energy deficit of 7.5% at the All India level as against a peak deficit of 18% and energy deficit of 11.5% during 1996–1997 while the gap between average financial cost of supply and average revenue realized increased from a level of 50 paise/kWh in 1996–1997 to 110 paise/kWh in 2001–2002. (Planning Commission, 2002a).

Reforms in India, introduced since 1991, did not result in significant improvement in the financial creditworthiness of the SEB's and could not induce capacity addition in the sector. For example, there were

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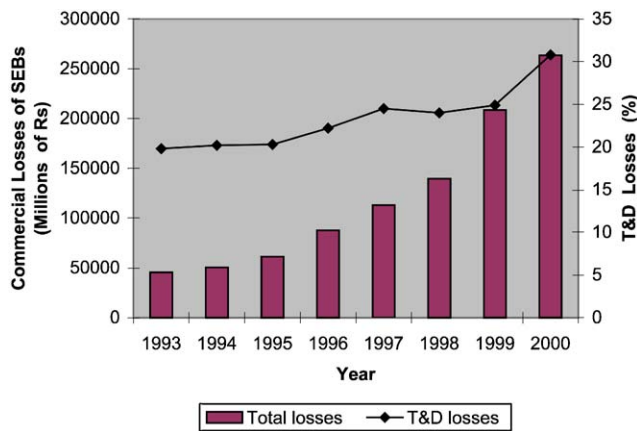


Fig. 1. Performance of SEBs.

significant capacity slippages from the 5-year Plan targets both in VIII and IX Plans (to the extent of 46% and 53%, respectively) (Planning Commission, 2002b). This was despite the fact that reforms have been very comprehensive and have achieved significant progress with respect to the following aspects:

- Separation of policy, regulatory and operational aspects including set up of independent Regulatory Commission at the Central and the State level.
- Increased commercial autonomy to distribution companies.
- Unbundling for focused benchmarking across entities and transparent administration of unbundled entities.
- Institutional reforms and capacity building initiatives including development of organizational capabilities.
- Transparent governance of the sector including better subsidy administration and well defined enabling legal, policy, regulatory and commercial frameworks.

The issue before the government was not the achievements per se, but concerns with respect to the pace of reforms and whether they fulfilled stakeholder's initial expectations. The government was therefore, inclined to take steps that would expedite the reforms and would revamp and restructure the power industry. It was with this aim that the Electricity Act, 2003 was recently enacted "to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected there-

with or incidental thereto" (The Gazette of India, Extraordinary, 2003).

The Act aims to provide the paradigm shift by progressive introduction to competition and choice. The intent of the Act is to provide complete commercial autonomy to buy and sell power. The provisions of the act have come into force since June 10, 2003 and the Act consolidates and augments the previous Acts of The Indian Electricity Act 1910, Electricity (Supply) Act 1948 and Electricity Regulatory Commissions (ERC) Act 1998.

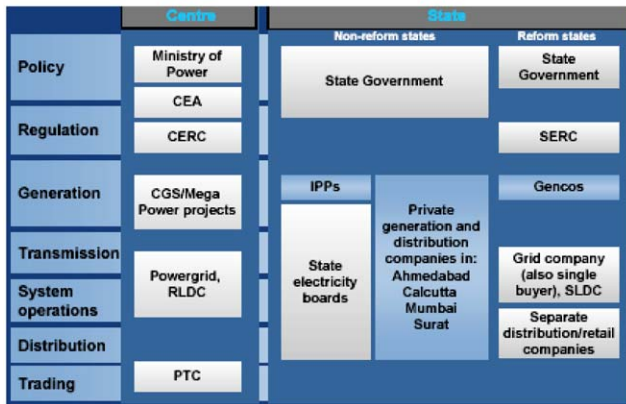
This paper analyses the probable impacts and implications of the Electricity Act 2003, that are likely to have far reaching consequences for the Indian Power Sector.

## 2. Electricity Act: what it entails

The Act is a move towards creating a market-based regime in the Indian power sector and consolidates the laws relating to generation, transmission, distribution, trading and use of electricity. It generally takes measures conducive to development of electricity industry, thereby promoting competition, protecting interests of consumers and supply of electricity to all areas. It also takes care of rationalization of electricity tariff ensuring transparent policies regarding subsidies, promotion of efficient environmentally benign policies, constitution of a Central Electricity Authority and Regulatory Commissions, establishment of Appellate Tribunals, etc., steps that shall entail impacts on every segment of the power sector be it generation, transmission or distribution and shall introduce large scale changes in the current Power industry Structure (Fig. 2). The main features of the Act are illustrated in Table 1.

Provisions in the Act will finally change the present Single-Buyer model to Multi-Buyer model. There would be several players operating at all the different stages of the power industry: generation, transmission and distribution. Open access to transmission and distribution system will create market for power. This will provide tremendous potential for investment in generation, transmission and distribution segments resulting in strengthening infrastructure, which is critical for the Indian power sector. In the medium to long term, competition created among various categories of players will hopefully, lead to improved efficiency and better customer service standards. Wholesale and eventually retail markets shall provide choice for end user in terms of supplier, reliability of supply and competitive tariffs. This will also lead to an environment where the monopolies enjoyed by the SEBs for buying/selling power will cease to exist, thus leading to a market determined tariff structure.

Current power structure



Proposed power Structure

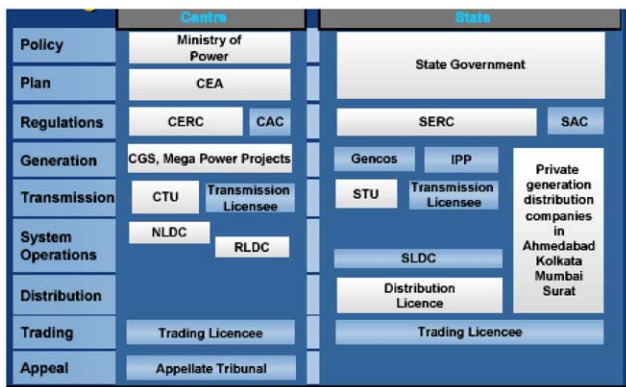


Fig. 2. Current versus proposed Indian power industry structure.

### 3. Impact on generation

Despite undertaking massive expansion projects the Indian Power Sector has not been able to match the rapidly growing demand for reliable and cost-effective supply. The demand has continued to grow at a compound annual rate of growth of nearly 8% (Das et al., 1999) and has outstripped the supply leading to a widening gap. For example, during 2000–2001, total energy shortage was 39,816 million units, i.e., 7.8% and peak shortage was 10,157 MW, i.e., 13% of the peak demand (MoP, 2001). To bridge its future demand–supply gap, India would need capacity addition of nearly 100,000 MW in the coming 10–12 years (Ghosh, 2002). The Ministry of Power (MoP) estimates that the additional capacity requirement to meet these shortages is about 10,000 MW every year. This translates into an investment of about US\$10 billion per annum (IT Task Force, 2003). In this scenario to fulfill the aim of Indian Government to provide power to all by 2012 (MoP, 2001) appears ambitious and practically difficult to achieve. To bridge the gap between investment requirements and available public resources, the active and large-scale participation of the private sector is necessary. Through Electricity Act 1991 Indian power sector

was opened for Independent power producers (IPPs), but the results were not up to expectation—by March 2002, only 11% of the installed capacity belonged to the private sector (Fig. 3). In view of the demand–supply gap, capacity slippages and to ensure greater private sector participation, the Electricity Act 2003 envisages new policy measures in the generation sector.

The Act will permit free entry into generation thereby delicensing generation. However, hydroelectric projects will require usual clearances from the Central Electricity Authority (CEA), besides those from environment ministry and the state government. Any generating company may establish, operate and maintain a generating station and have grid connectivity if it complies the technical standards, laid by CEA. The IPPs companies can access transmission lines without any discrimination or can construct their dedicated lines. IPPS or any generating company would have complete commercial autonomy to sell its power to any entity. (However, as per the Act Transmission Licensee, National and Regional Load Dispatch Centers and Central and State Transmission Utilities cannot engage in trading business.)

#### 3.1. Importance of captive power generation for India

Another area in which the Act is likely to have an impact is the captive power generation. The installed captive power plant (CPP) capacity in India as in July 2002 was 24,000 MW, i.e., about one-fourth of the total installed capacity. Despite restrictions, captive power growth at over 8 per cent rate has been higher than the 5% growth in total installed capacity (Infraline.com, 2003a). So far the policies for setting up CPPs were not uniform, varying from state to state, and substantial policy differences existed in terms of wheeling and banking charges, third party sales, fuel use and size restrictions on CPPs amongst various states, so that the overall scenario was quite confusing for an investor.

The Electricity Act 2003 endeavors to simplify these procedural hassles. Captive plants will be freely permitted henceforth, not only for captive use in the promoter’s own plants but also for the use of groups of industries, thus imparting new perspectives to the current policies on captive power generation in India. The Act effectively does away with any permission required from the SEBs or CEA for setting up the captive power plant and transmission networks, only the relevant technical details need be provided to the State Government so that it may assess the demand supply position, long term impact of such capacities and formulate policies accordingly. CPPs are also free from surcharge due to the cross subsidy. Any surplus power generated by the plants can be offloaded into the grid. Though, the entry barriers to setting up captive power plants have been eased, the supply of electricity from

Table 1  
Salient features of the Electricity Act 2003

S.No.	Category	Key feature
1	Objectives	Encouraging autonomous regulation with the separation of policy regulation and operational aspects Rationalizing tariff and lowering the cross-subsidization levels Creating competition in the industry Ensuring supply of electricity to all areas Protecting consumer interests
2	Policy	A National electricity plan shall be prepared in accordance with National Electricity Policy every 5 years National policy on stands alone systems for rural areas and Non-conventional energy systems National policy on electrification and local distribution in rural areas
3	Restructuring	Vertical integration instead of horizontal unbundling of State Electricity Boards (SEBs) to make them financially strong State governments will have the freedom to decide the sequence and phases of restructuring, and also retain the integrated structure of the SEB for a limited period Introduction of the concept of power trading as a distinct activity, and the introduction of a spot market for bulk electricity
4	Generation	Removal of captive power plants from the ambit of licensing and other permissions Generators can contract directly with DISCOMs DISCOMs can have embedded generation Captive generation allowed freely—can supply to associates Elimination of Licensing requirement and techno-economic clearances for generation projects except hydel projects
5	T & D	Provision for Private participation in distribution Surcharge for open access to meet current cross-subsidy burden (except for CPP's) Dedicated transmission lines allowed (not regulated) Central and State transmission Utilities (CTU and STUs) not permitted to trade Transmission licensees allowed Multi Year Tariff (MYT) recommended Bidding allowed Provision of Non-discriminatory open access mandatory, Open access in distribution is to be introduced in phases. SERCs will frame regulations within 1 year regarding phasing-in of open access, open access only when allowed by regulator Fixed charges for third party sales for service obligation of incumbent Non-exclusive licensing Parallel networks explicitly allowed Mandatory metering within 2 years (extendable by GoI)
6	Regulation	Gradual (progressive) reduction and ultimate elimination of Cross-subsidization The formation of a State Electricity Regulatory Commission (SERC) in every state to be mandatory
7	Legislation	Provision for appropriate legislation to check power theft Provision of Appellate Tribunal
8	Consumer protection	Consumer protection against failure to meet the standards of performance Mechanism for redressal of consumer grievances

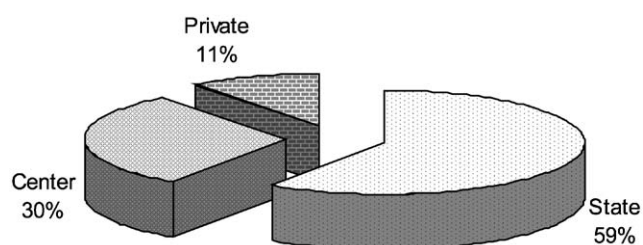


Fig. 3. Contributions of various sectors in ownership of installed capacity (as on 31st March 2002), Source: Planning Commission, 2002 Data.

captive generating plants through the grid shall be regulated in the same manner as the generating stations of a generating company.

#### 4. Impact on transmission

So far the Indian Transmission system has been taken care of by the Power Grid Corporation of India Limited (PGCIL). The Ministry of Power (MOP) had notified the PGCIL as the Central Transmission Utility (CTU)

after the Electricity Laws (Amendment) Acts, 1998. The PGCIL operates over 39,000 Circuit km of EHV transmissions network across the country and has the distinction of being ranked among the top six transmission utilities in the world (Chitkara et al., 2001). For making region-wise demarcation for efficient, economic and integrated transmission and supply, Government of India (GoI) has also constituted Regional Load Dispatch Centers (RLDCs).

Although the Electricity Laws (Amendment) Act, 1998 had allowed independent transmission service providers to set up transmission lines for interstate and intra-state transactions, but under the direction, control and supervision of the Central Transmission Utility (CTU). Section 27(A) of Part IIA of the Electricity Laws (Amendment) Act, 1998 empowered the CTU to exercise supervision and control over the interstate transmission system. The Regional Load Dispatch Centers (RLDCs), which are mandated to coordinate the integrated operation of the power system in a particular region, are required by the law to be operated by the CTU. Also the Section 27C (4) of the Electricity Laws (Amendment) Act, 1998 further stated that the applicant first obtains the approval of the CTU. Thus CTU has been given extra-ordinary power by the Electricity Laws (Amendment) Act, 1998. This was justified on the basis of the fact that in any retail competition regime the role of transmission licensee is that of being the wires owner. Because of its integrated nature, this business has to be a regulated business, and transmission capacity can be procured on a competitive basis from multiple players by any centralized agency CTU or STU as the case may be. Grid planning function has to remain with CTU or any other system operator for safety, security and reliability reasons.

The Electricity Act 2003 permits multiple licenses in parallel transmission and distribution lines; thereby making a provision for private transmission licenses and in the process provides a fillip to power trading. Thus Act will introduce non-discriminatory open access to network. The CTU and STU are entrusted with the task of undertaking transmission of electricity and planning and coordinating the inter-state and intra-state transmission network in the country. CTU and STU will have right to provide direction, control and supervision of private transmission service providers. For the smooth operation of Transmission sector the Central Government has been entitled to establish a center at the national level, to be known as the National Load Dispatch Center (NLDC) for optimum scheduling and dispatch of electricity among the Regional Load Dispatch Centers (RLDCs). NLDCs shall be operated by Government but shall not engage in the business of trading in electricity. Similarly, RLDCs and SLDCs will take care of regional dispatch and intrastate dispatch respectively, they are also governed by Government and

shall not be engaged in the business of trading of electricity. Pending notification by the governments, the CTU and STU shall operate the RLDC and SLDCs, respectively. RLDCs/SLDCs shall comply with principles, guidelines and methodologies as specified by the CERC/SERCs in the Grid Code.

#### *4.1. Impact on utilities operations due to new transmission system*

Bulk supply business will cease to exist with the State Transmission Utility (STU) as per the provisions of the Act. If the Transmission Company (Transco) intends to continue in trading, the contracts may have to be transferred to a separate trading entity owned by the Government. Alternatively, MBM can be put in place where the Distribution Companies (DISCOMs) contract directly with Generators. The Transmission Companies (Transcos) would need to commence a two-way/three-way separation of business.

In the new regime, the State Transmission Utilities (STUs) have been entrusted with critical planning function to ensure that congestion does not occur. Separation of responsibilities between STUs and System Operator (SO) in terms of functions would need to emerge especially with regard to the planning and implementation parts. In any case implementation of open access conditions would be complex. The SO will need to implement the rules of open access but the ownership could be a contentious issue. The Implementation responsibilities and powers not clearly outlined in the Act and would need to emerge through the regulatory process. Also the settlement arrangements would increasingly become sophisticated and therefore, SOs need to start preparing for the emerging scenario.

The Merit Order dispatch would also need particular attention. The SO will be the primary agency to ensure that there is no abuse of market power. Ideally the market mechanisms should result in an automatic development of Merit Order conditions. However, that may be a long way away considering the realities of the present Indian electricity market.

What needs to be especially noticed and taken care of is the fact that the available transmission capacity currently is almost fully committed to existing generators and there is little surplus capacity. Unless present lines are modified, little electricity will flow directly to bulk users. This may entail considerable financial requirement, planning and commitment.

## **5. Impact on distribution**

Many states are adopting reforms in distribution sector by adopting private participation in this sector. The Act provides solutions to the root problems of the

State Electricity Boards (SEBs), regarding their poor financial health due to continued subsidies (currently 1.5% of GDP) resulting in yawning gap between the national average cost of generation of Rs 3.50 per unit and the average realization of Rs 2.50 per unit. In India the Industrial and commercial sectors have been bearing the brunt of the subsidies provided to the domestic and agriculture sector. Despite continuing reforms cross subsidies have continued to thrive mainly because of political compulsions and as a rationale for serving the underprivileged through universal provisioning. The distortions in the tariff rates are severe: by 1999–2000 the Tariffs for the industrial sector became 15 times that in the agriculture sector and 2.1 times that in the domestic segment (calculations from raw data in [Planning Commission, 2002a](#)).

At the international level it is now a well recognized fact that cross-subsidy regimes prove counter-productive in the long run and that such regimes are sub-optimal. For example, [Chattopadhyay \(2003\)](#), assert from a study conducted in the Indian background that demonstrated cross-subsidies lead to wastage of resources, and rising price elasticity of electricity demand in industry, forcing the industry to seek energy alternatives leading to declining revenues from the industry reflected in the share of industry in the total energy sales. In 2001–2002, it was 29% as against 33% in 1996–1997 ([Planning Commission, 2002a](#)). This apparently forced the government to seek changes in the distribution sector in the Electricity Act 2003.

Following are the important features of the Act for the distribution sector:

- Non-exclusive licensing. Parallel networks explicitly allowed.
- Mandatory metering within two years (extendable by Electrical Regulating Commission (ERC)) from date appointed by Government. CEA may direct installation of meters at stages/locations deemed proper.
- Compensate consumer for failure to meet performance standards.
- Non discriminating open access to be introduced in phases.
- Such open access may be allowed before the cross subsidies and are eliminated on payment of a surcharge in addition to the charges for wheeling as may be determined by the State Commission. This surcharge shall be utilized to meet the requirements of current level of cross subsidy within the area of supply of the distribution licensee. However the surcharge and cross subsidies shall be progressively reduced and eliminated (as specified by the State Commission). Such surcharge shall however, not be leviable in case open access is provided to a person who has established a CPP for carrying the electricity to the destination of his own use.

- It shall be the “duty” of any distribution licensee to supply on request within a month (period extendable by the regulating commission for certain cases), subject to agreeing to pay the price.
- Where open access is allowed, consumers may enter into an agreement with any person for supply or purchase of electricity on such terms and conditions (including tariff) as may be agreed upon by them.
- Any distribution licensee can enter into generation business.
- Subsidies, if any, would be paid in advance, as prescribed by the regulatory commission. This is a positive development and an assurance to the Distribution Companies (DISCOMs), yet it may not really take away the entire risk that private DISCOMs would be exposed to, since it would depend on the state government’s willingness and ability to service the subsidy requirement.

### 5.1. Implications of the act for power distribution

The Act allows distribution to be separated from supply. Supply circles limited even up to the level of substations could be given to private parties, thus effectively doing away with the requirement of large utilities and business parties. A much wider choice of parties could thus be tapped for privatization of distribution than has been possible in the Orissa and Delhi models.

In the new framework, innovations at various levels will be required to keep supply costs down. These could include adoption of alternative technologies like distributed generation, or alternate arrangements made for high cost energy (example, non-conventional energy being traded through Power Trading Corporation (PTC)).

Isolated grids would need active consideration (as also mandated by the law if enacted in current form) and DSM will become an even more important imperative for maintaining supply standards. The new environment would invariably require effective regulatory management to minimize business risks.

Due to the positive environment provided by the Act competition in the Distribution sector will increase in the medium to long term, especially due to open access condition. The larger consumers will have access to various suppliers. Hence, DISCOMs will have to work on strategies to retain consumers. The players will also have to focus on controlling the costs, and hence will have to concentrate on improving the existing infrastructure.

## 6. Implementation of open access: core issues

Open Access implies that a number of licensees can reach a consumer through a network operated by a DISCOM. The access charges (called the wheeling

charges) to be paid by the licensee shall be determined by the regulatory commission. Such non-discriminatory open access is a prerequisite to competition.

The rules regarding open access are to be decided within a year, hence in the emerging framework the responsibility of implementation and power of jurisdiction are still unclear. In addition a proper, well-defined framework is essentially required, as the implementation of the open access condition will be complex. The success of the open access system would further depend on the proper implementation of the merit order dispatch system. There might also be considerable time lag amongst various States to implement the open access system, as the State Electricity Regulatory Commissions (SERCs) have the discretion to allow open access to retail consumers in the time frame that suits them. Therefore, there needs to be a binding framework for introducing open access to retail consumers with a definite timetable synchronized with cross subsidy elimination path.

The open access system would also call for greater infrastructure investments, as its implementation requires excess available transmission capacity in the system. However, presently several sectors have current transmission capacities fully committed to the existing generators with little surplus. Another important prerequisite for implementing the open access system is electronic and real time metering at all levels of the transmission system. All this would invariably result in additional investment requirement.

Eventually, open access may lead to declining electricity prices in line with the international experiences. For example, electricity prices in UK have fallen by over 30% over the last decade and similar trends have been observed in USA and European countries (Haldea, 2003). In India also there is every chance that prices may eventually fall (after an initial upsurge to adjust to the realistic costs), once private investors start producing more power and are able to sell it directly to the consumers. All this however, may take a long time spanning more than a decade.

The open access system is likely to become fully operational in phases gradually over a long time. Once operational, the bulk buyers may be the ones who may benefit in terms of the choice of suppliers as well as the competitive prices. The implications of the policy change in the form of open access would be large-scale, interesting, shall unfold only in the long run and shall be greatly influenced by the policy frameworks that are adopted by the various empowered state commissions.

## 7. Trading: a new policy perspective

Subsequent to the Electricity Law (Amendment) Act, 1998, the Power Trading Company (PTC) was estab-

lished with majority equity participation by the PGCIL along with the National Thermal Power Corporation (NTPC), the Power Finance Corporation (PFC), and other financial institutions. This structural arrangement was not a very healthy sign for an evolving competitive market, since trading is a service wherein competition is natural and should be provided. Thus this service needed to be opened to more players. The Electricity Act, 2003 allows third party sales, and introduces the concept of trading of bulk electricity. The trading activity will be recognized as a distinct licensed activity. The basic intent is to introduce competitive market in India; there are no restrictions on the number of players in the business of electricity trading. Whosoever qualifies the eligibility criteria (technical & financial) to be set by CERC or relevant SERC, would be eligible for obtaining the trading license. This license will be awarded by ERC, based on the various norms specified by the commission. Distribution licensee and generation companies can engage in power trading. However, NLDC, RLDC, SLDC, CTU and STU and transmission licensees have not been allowed to trade in power. This is again to avoid an undue advantage to these players. ERCs will have the right to fix a ceiling on trading margins in intra-state trading, if necessary.

## 8. Role of the regulator

Role of Regulator shall be very crucial as happens in any free and open power market structure. The role will be important especially for promoting competition, fixing reasonable charges for transmission, generating tariffs, fixing wheeling and cross-subsidy charges, and in protecting the consumers from the rising prices of electricity, more so in time of shortages. In the regulated markets the role of the regulator shifts from setting prices to keeping vigilance that the markets remains competitive and non-monopolistic and to ensure market development. Table 2 illustrates the role of the regulatory commissions (Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commissions (SERCs) in the new regime that the Electricity Act 2003 ushers.

The testing times for the regulator shall be to see through the transitional period that may take a few years. The smoothness with which the transition period is navigated would depend on the promptness of the regulator and their jurisdiction, which has not yet been completely clarified. Also, for any policy to materialize it is advisable to set time limit for its provisions to come into effect. In this case, however, the Act does not set time frame for the transfer of all functions listed in the Act from federal state governments to respective regulators.

Table 2  
Role of regulatory bodies in the new regime

	Aspect	Earlier role	Role consequent to act
CERC	Generation tariff	Regulating tariffs for Central and Inter-state generating stations	Regulating tariffs for Central and Inter-state generating stations
	Transmission tariff	Transmission tariff setting for Inter-state/region transmission facilities	Determine tariffs, charges for intervening lines in case of disagreement
	Open access	No defined role	Facilitate open access. Determine surcharge for access by consumers
	Cross-subsidy	No role	As above
	Trading tariffs	Concept did not exist	Unregulated. However, regulator <i>may</i> fix trading margins. Bidding allowed
	Load dispatch	No role defined, except for system security aspects	Dispute resolution powers provided to CERC
	Licensing	For transmission facilities	For transmission and trading. License conditions to be determined within 1 yr
	Promoting Competition	Stated objective—however mechanisms not defined	Market development identified as key objective. Caps can be fixed
	Captives/NCE	No role	Dispute resolution powers on access to transmission system
SERC	Generation/Bulk tariff	1. Approving generation tariff 2. Regulating bulk supply tariff	1. Approving generation tariff 2. Regulating bulk supply tariff function is now replaced by trading function in the Act for which margins will be determined by the appropriate commission
	Transmission tariff	Determining transmission tariff on cost-plus basis (Sixth Schedule)	Specify only if Licensees cannot agree upon tariffs. Determine surcharge
	Open access	No defined role	Promote open access with surcharge as deemed necessary
	Cross-subsidy trading tariffs	Objective defined—specifics on	Cross-subsidy mechanism absent
	Load dispatch	Concept did not exist No role defined except that the procurement should be efficient	Unregulated. However, regulator may fix trading margins Dispute resolution powers envisaged
	Licensing	Issuing powers for transmission, bulk supply distribution and retail	Trading included. License conditions to be determined within 1 yr
	Promoting competition	Stated objective—however mechanisms not defined	Market development identified as key objective. Caps/directions can be issued
	Captives/NCE	No role defined	Explicitly recognized. Incentives for NCE. To specify percentage of cogeneration.

The Act leaves a lot of scope for improvement in selection of regulators; the criteria for the qualification for the selection of regulator are very general and leave undefined much that is desirable in terms of proven technical credentials. Furthermore, the regulators shall be appointed initially for the period of three years and their term can be extended by the government for another three years. The implications of all of these are significant and far-reaching; the Act makes electricity regulators subservient to the governments that appoints, renews their term and terminates them, making them vulnerable to political pressures.

The Electricity Act 2003 provides for the establishment of an Appellate Tribunal by notification of the Central Government for the purpose of hearing appeals against the orders of adjudicating officer or the Regulatory Commissions. For the purpose of discharging its functions the Tribunal will have the same powers as a civil court and its orders shall be equivalent to the decree of a civil court. Chairperson of the

Appellate Tribunal shall exercise general power of superintendence and control over the Regulatory Commissions. The Act also defines the Terms of the Office and terms and conditions of the service for the members and Chairperson of the Tribunal. Thus it is hoped that the regulator shall be regulated by an independent forum that shall redress the ultimate grievances.

## 9. The electricity act and rural electrification

Indian economy is predominately agrarian and as much as 72.2% of the population resides in the rural areas (Census, 2001). According to Ministry of Non-Conventional Energy Sources (MNES), 5000 villages would be electrified in the 10th Five-Year Plan starting April 2002 and by the year 2012 all the 18,000 villages would be covered. It is estimated that on an average, an investment of Rs. 2 million (nearly US\$42,550 at the

current level) would be required to electrify a remote village (four hours of power supply per day) (Infra-line.com, 2003b). Thus implications in terms of the massive investment required are significant with minimal possibilities of returns (in terms of revenues). It is not very likely that the private sector will find the task attractive and the only hope would be the international aid in the form of loans etc. With GoI promoting a number of schemes and programmes to accelerate the pace of village electrification, much-needed impetus has in the past, come from the international arena. For example, The United Nations Environment Programme (UNEP) has launched a major new \$7.6 million initiative to offer 18,000 southern Indian households low cost financing for solar generated electricity (Infra-line.com, 2003b).

The Electricity Act 2003 envisages a National Policy (to be prepared by Central Government in consultation with the State Governments) on stand-alone systems (including those based on renewable sources of energy and other non-conventional sources of energy) for rural areas. Hopefully, this would make the process of electrification self-sustaining in the rural areas by making it a commercial process. This would also pave the way for the non-conventional producers of power, reinforced by the fact that the Act allows a person (notified by the State Government) to generate and distribute electricity in rural areas without getting a license from the Commission. The new policy will help attract necessary investment in generation as well as distribution from small and medium private players and also help the rural areas grow economically and socially.

The Act also proposes for formulation of a National policy for rural electrification and local distribution in rural areas. This policy would exclusively deal with bulk purchase of power and management of local distribution in rural areas through local Institutions such as the Panchayats (elected village committees), users' associations, co-operative societies, non-governmental organizations or franchisees. The policy is to be formulated by the Central Government, in consultation with the State Governments and the State Commissions. Under the Act, it will be the obligation of the Appropriate Government to supply electricity to all areas including villages and hamlets. This would also help expedite rural electrification programme.

Overall the policy perspective is likely to benefit the smaller private sector enterprises that deal in renewable and non-conventional energy sources. An attempt has certainly been made to introduce private sector participation in rural electrification, as no license would be required for generation and distribution in rural areas. This is a positive development even from the perspective of strategic investors in the DISCOMs. Not only is there greater scope for smaller players in power business now but also there is hope to light the life of every individual

in the country as electrification of remote villages has been an unenviable task so far.

## 10. Consumer protection

The entire Indian power sector has so far been driven by populist measures that have cultivated subsidy regimes. In turn these policies have promoted system inefficiencies in the form of poor power quality and poor service qualities. It is generally perceived in India that both of these will improve in the new restructured set-ups. However, Sharma (2003) refers the studies by Coyle et al. (2000) and Paddon and Small (1999) to drive home the fact that consumer interests in the privatized and restructured regimes may actually not be looked after so well as is generally perceived. Perhaps in line with such apprehensions, the Electricity Act 2003 has spelled "protecting interest of consumers and supply of electricity to all areas", in its preamble as specific policy direction to ensure consumer protection.

The Act provides protection to consumers with reference to standards of performance. If a licensee fails to meet the specified standards then disregarding any penalty that may be imposed or prosecution pronounced, the regulatory commissions will have powers to impose appropriate compensation to be paid to the affected person within the time limit of 90 days. In addition, every licensee will have to furnish information about the level of performance achieved by it to the commission and the ERCs shall arrange for publication of such information at least once every year. Besides the tariffs shall be regulated by the commissions such that safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner, is ensured. Besides the State advisory Committee constituted by the respective SERCs will have consumer protection as one of its objectives.

The Act also provides for establishment of a forum by the distribution licensee, within six months from the appointed date or date of grant of license, whichever is earlier, for redressal of grievances of the consumers. An authority to be known as Ombudsman shall settle the grievance of the consumer in accordance with the guidelines specified by SERC.

To protect honest consumers who pay, the Act also lays out provisions for specific penalties and punishments such as imprisonment for electricity theft or theft of electrical lines, tampering of meters, or deliberate or negligent wastage of electrical energy.

The Act has also made it the policy of the government to endeavor to supply electricity to all areas. Distribution licensee has to supply electricity within one month from the date of request for supply, except where capital works are required for connectivity. Failure of distribution licensees to supply within the said period would

attract penalty. In the urban areas a committee is to be set up in each district to be constituted by the appropriate government to review the quality of power supply and consumer satisfaction. Separate policies for the rural areas where majority (72.2%) of consumers reside, have been envisaged thus giving priority to the social objective of power supply to all.

## 11. Environmental concerns

Environmental impact of the reforms is an area that is of vital concern; however, linkages between reforms and environmental concerns are not yet established. [Khanna and Zilberman \(1999\)](#) demonstrated the potential of institutional and economic policy reforms that provide incentives for adoption of efficiency-enhancing production practices to reduce carbon emissions while increasing net electricity generation. Similarly [Kulshreshtha \(2000\)](#) argues that Coal using technologies might improve (fluidized bed combustion, etc.) resulting in better utilization of poor quality coal, and alternatively, utilities can opt for coal beneficiation or might simply import good quality coal, thereby decreasing emissions. Fuel substitution is another way out for reducing emissions; countries like China are, in fact, actively promoting the policy of replacing coal by other environment benign fuels such as oil, renewable energy and Gas ([Wu, 2003](#)). Other studies subscribe to a conflicting viewpoint. For example, field data from Australia suggest that the reforms have actually led to increasing emissions ([ABARE, 2000](#)). [Sharma \(2003\)](#) also demonstrates that the trends indicate increasing carbon dioxide contributions from the power sector ever since the introduction of the competitive markets. This might possibly be an outcome of benchmarking criteria that often employ short-run marginal costs and other economic and technical parameters to evaluate the performances of the power utilities ([Jamasp, 2002](#)). Market features such as substitution of high cost environment friendly fuels and technologies with the relatively cheaper but not so benign fuel and technologies might tax the environment, but do not form part of the traditional benchmarking process, and hence the potential power producers may not have much incentive (unless forced by regulatory measures) to reduce carbon emissions.

Environmental impacts assume significance for India particularly because India, the second most populated country, contributes nearly 5% of global CO<sub>2</sub> emissions and there are possibilities of increasing this share in future. This increasing trend, combined with industrialized countries success in stabilizing their CO<sub>2</sub> emissions, may make its global share even larger ([Reddy and Balachandra, 2003](#)). The power sector is amongst the greatest contributors to the emissions. India is the

world's third largest producer of coal and this coal has high ash content and low calorific value ([EIA, 2002](#)). With coal contributing as much as 59% of the fuel type in the total installed capacity as on June 2002 ([MoP, 2002](#)) and the fact that increased coal consumption over the past 4 decades has led to a nine fold increase in energy related carbon emissions ([EIA, 2002](#)), the implications for the environment might actually be far reaching.

Conspicuously, the Electricity Act 2003 is largely, and almost completely, silent on matters concerning the environment. As a matter of policy, it does however recognize “promotion of efficient and environmentally benign policies” as one of the objectives right in its preamble, but does not spell out detailed policy directives in this regard. It is completely left to the individual regulatory commissions to enact measures that further the said objective and to the usual government clearances for large thermal and hydel projects. Under such a scenario, it is likely that environmental concerns may take a back-seat, more so because the government is preoccupied with the challenge of providing reliable and affordable power supply to all as a matter of priority.

## 12. Shortfalls, limitations and concluding remarks

It is expected that The Electricity Act 2003 will bring about revolutionary changes in the Indian Power Industry and would bring around a transformation that would act as model policy reforms for other developing countries. The Act however, does leave certain policy issues unresolved which have to be decided by regulators in consultation with appropriate government ([Table 3](#)). These issues include:

- Network pricing complexities—resulting in capacity excess or shortage.
- Mechanism for pricing supply till open access is allowed.
- Settlement complexities in context of present cash shortage in system.
- Transmission bottlenecks negating open access.
- Environmental Concerns have not been addressed with reference to the new reform, and
- Restructuring policies.

There is yet another category of Issues that have been addressed only partly in the Act. These issues include:

- Market dominance of few dominant generators that may result in increased prices.
- Mechanism for preventing sharp increase in trading prices—The market may not send appropriate price signal (or security) for new generation capacity.

Table 3  
Major policy issues of concern in the Electricity Act, 2003

S.No.	Category	Policy issues
1	Generation	<p>Will existing Generation Companies directly contract with DISCOMs?            How will the Genco contracts be allocated to DISCOMs?            Will there be a government intermediary (trader) to take over existing contracts?            Can existing Licensees with direct transmission links function without a transmission license? (But with a transmission license they cannot trade/resell)            What is the voltage definition of transmission?            How is capacity to be scheduled and dispatched? What are the Merit Order Implications?            Can Gencos trade among each other? Is reselling to Gencos by traders allowed?            Is group captive capacity going to lead to inefficient generation?            Who sets the detailed rules for group captives?            Can existing contracts be opened up by virtue of generation being a regulated activity?</p>
2	Transmission	<p>How would CTU redistribute cross subsidy surcharge?            Would new consumers bear cross-subsidy burden for open access?            Is merit-order dispatch a role of the LDC anymore? Or do the Discoms/Customers/Traders need to schedule their own generation?            Institutional capacity in the STUs for transmission constrained scheduling and settlements lacking.</p>
3	Distribution	<p>How quickly will cross subsidies and the cross subsidy charges be eliminated?            Will open access and free captive generation lead to rapid erosion of paying consumer base of the DISCOMs?            Will parallel networks lead to cherry picking?            Do regulators fix License areas or intending Licensees define it?            How will the DISCOMs gear up to metering challenges?            How is network access to be priced (form of MYT)?</p>

There are other open ends that might cause concern:

- The Act has not specified the time frame for the regulators to allow open access system and for the Government to transfer all the functions (specified in the Act) to the regulator.
- The Act, while recognizing the fact that cross-subsidies should be eliminated, does not specify any concrete time frame for elimination of the cross-subsidies.

The timeframe and adherence to a strict timetable for implementation of the various provisions of the Act will hold tremendous importance for the policy initiatives to succeed.

It is expected that the proposed Act would provide the much-needed environment for ensuring huge investments in the Indian Power sector. The consumer, too, might benefit in the deregulated regime, except for the low-tension consumers who will almost certainly stand to lose in the short term as the Act prioritizes phasing out of cross-subsidies. But, the act should see capacity addition focusing on viable industrial consumers, and the price of industrial power may eventually come down. The benefits from liberalization of the captive power generation sector and from the increased use of open access option will take time to show. Nevertheless, the industry experts are quite hopeful about the future of the Indian power sector subsequent to the introduction

of Electricity Act, 2003, that promises to usher in a new policy regime in the sector.

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