

# Can Delhi Learn from the Competitive Model of Power Distribution in the UK and the US?



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## Table of contents

Abstract.....	2
Introduction.....	3
Delhi's system of state regulated private electric utility monopolies.....	4
Liberalisation of the electricity sector in the United States and United Kingdom.....	6
What enabled retail competition to be possible.....	7
Characteristics of the Retail Competition Model.....	8
Pricing System for Transmission and Distribution Wire Services.....	10
Distribution and Retailing Separation.....	10
Benefits of retail competition model.....	11
Conclusion.....	12
Bibliography.....	14

## Abstract

A reliable and cheap electricity supply is extremely necessary for growth of the manufacturing as well as service sector of any nation. The People's Republic of China built its massive manufacturing capabilities on back of a cheap and reliable power sector enabling the nation to pull out the maximum number of people out of poverty in human history. India desperately needs a system to develop its power and infrastructure sector so as to boost its sluggish manufacturing capabilities if it ever wants to pull its majority of people out of poverty. However its initial plan of developing this sector in a command and control system (similar to that of China) has failed miserably. It did experiment with western style privatisation in Delhi which has been relatively very successful. Now these measures have to be expanded. The goal of this paper is to compare the effectiveness of the Delhi model of private regulated monopolised electricity distribution companies to the retail competition model of developed nations like the UK and US and see how their retail competition model works. The Delhi model of distribution utilities and analysis of how the government privatised the distribution business and how these companies perform today is discussed briefly. The common features of these systems retail competition model employed in the UK and US is discussed, the initial differences in how their energy sector was liberalised is compared. Developments that made competition in power retailing possible and the characteristics of the retail competition model are discussed. The concept of retail being differentiated from traditional distribution services along with the pricing model is talked about. The benefits of this model are discoursed about.

## Introduction

Electricity has a dual character, it is both a good as well as a service, which usually leads to a great level of government involvement and its supply has some unique characteristics. Unlike other goods and services it is not possible, under regular working conditions, to keep it in stock, ration it or have consumers queue for it. Due to the benefits of efficiently management of supply and demand and from higher efficiencies of economies of scale, the power sector is believed to be a natural monopoly. The organisation of the power sector was based both on vertically integrated monopolies and tight regulations that left no room for market forces. The fundamentals of this organization were based on the monopoly nature of the power sector. This meant that electricity generation; transmission and distribution were less costly when carried out by a single integrated firm than when performed by several firms. The scale of economies supported this organisation around vertically integrated utilities.

## Delhi's system of state regulated private electric utility monopolies

To benefit from increased efficiencies from privatisation and private incentive, like reduction in AT&C (aggregate technical & commercial) losses (includes losses due to electricity theft and energy wastage due to heating of wires), in 2002 the Delhi Government privatised the Electricity distribution through 49-51 partnership with Tata Power and Reliance Infra with the private companies getting the 51% and thus companies had the control over the business management but the Delhi Electricity Regulatory Commission (referred to as Regulator) essentially controls the selling price of each unit power they sell and also the price of power they purchase from the power producers.

In 2002 when the sector was privatised the Distribution companies were guaranteed a 16% return on equity according to the selling price and the purchase price prevailing then<sup>1</sup>. Any reductions in AT&C would further add to the profits of these distribution companies. The AT&C losses have been reduced by 75%, from 53.1% to 13.2% for North Delhi Power Limited<sup>2</sup>. BSES Rajdhani has reduced losses from 51% in 2002 to 19% in 2010 while BSES Yamuna has reduced losses from 63% in 2002 to 23% in 2010<sup>3</sup>. However since 2002 the purchase price has increased in much greater proportion to the dictated selling price although there has been a significant reduction in AT&C losses. "Average retail tariff rose by 40%, from Rs 3.84 per KWhr to Rs 5.38 per KWhr, of which a 22% increase was allowed by the regulator just last September. This should be seen together with the increase in average power purchase price over the period, which was at 179.6% (from Rs 1.52 per KWhr to Rs 4.52 per KW/hr). So, while the sale to purchase price ratio during the Delhi Vidyut Board reign was a whopping 2.53, it reduced dramatically to 1.19 at the end of the 8 years since then"<sup>4</sup>.

These companies are in a very serious financial and liquidity crunch and are heavily indebted on costly borrowings from the banks. The total debt of Delhi Distribution companies is around Rs 6000 crores. Only recently has the electricity tariff been revised so that these companies can break even and repay their creditors.

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<sup>1</sup> Power: From Privatisation to Competition, Delhi Citizens Handbook 2003, Center for Civil Society, 2003

<sup>2</sup> <http://praja.in/en/blog/murali772/2011/12/24/delhi-power-distribution-privatisation-model-all-cities-follow>

<sup>3</sup> <http://www.powertoday.in/News.aspx?nid=bNYn3zmFmERvCzdk2MdOUg==&PageLength=Full>

<sup>4</sup> <http://praja.in/en/blog/murali772/2011/12/24/delhi-power-distribution-privatisation-model-all-cities-follow>

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Though this system of control of prices through regulation keeps the prices in check as well as delivers efficiency of privatisation. The inability of market forces to automatically determine price in the present system keeps the future financial health of these distribution companies in danger as they heavily depend on the Regulator to regulate the prices effectively otherwise just as seen recently the inability of BSES to pay the generation companies (National Hydro Power Corporation and Damodar Valley Corporation) would have led to massive power cuts in the summer of 2012.

According to the Times of India, the Ministry of Power will amend the Electricity act 2003 by 2013. This amendment will allow multiple suppliers of power in any licenced distribution area. The limit on unrestricted access to distribution network for retail or consumption purposes of 1MW would be removed and full open access would be enabled so as to allow other distribution companies transport power through network owned by one company. Thereby creating competition amongst the existing distribution companies. This means that Tata Power Delhi Distribution limited (NDPL's new name) would be able to sell power to BSES areas and BSES would be able to sell power to TPDDL areas by paying a cross subsidisation charge or a wheeling charge (charge for using network owned by other distribution company)<sup>5</sup>.

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<sup>5</sup> Verma, R. 2012, Unhappy with power supplier? Pick another one. Times of India, July 18

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## Liberalisation of the electricity sector in the United States and United Kingdom

In the US, the power industry was made almost entirely of private investment and traditionally property rights enjoy strong protection. Regulations that protected competition were ineffective when applied to the monopolies resulting from past regulations. Hence the electricity sector was liberalised with much more alertness of and provision to counter the problem that too much influence of a single company could lead to consumer exploitation<sup>6</sup>. Liberalisation in the US has always tried to safeguard the affordability of resulting power tariffs. A careful relaxation of regulatory controls has been done with significant awareness of the problems that misuse of the market power can result in.<sup>7</sup> Regulatory failure to reduce costs was the primary cause of liberalisation of the sector toward retail competition in the US. Economic considerations were the driving force in the process towards retail competition. Specifically, high mean prices indicated of potentially large welfare gains from competition.

In the United Kingdom, restructuring and privatisation of the power industry among many generation companies competing was done to form a wholesale market. Every consumer was then allowed the right of choice of supplier, inducing retail competition. Distribution and transmission continued to be regulated activities, replacing return on investment with regulation (Similar to Delhi), by incentive and

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<sup>6</sup> Nunez, A. Liberalisation of Electricity Sector in European Union: Present State and Some Open Questions.

<sup>7</sup> Dar, V. 1995. The Future of the U.S. Electric Utility Industry. The Electricity Journal, July.

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market forces. While the transmission business remained in the hands of a single company, distribution was fragmented into a number of companies<sup>8</sup>.

Common features in many countries like US, UK or India are :

- Distribution companies, large customers and generators have free access to transmission and distribution networks.
- A spot market and also futures market in electricity is well established in some countries.
- Deregulation of wholesale power prices paid by large consumers Small and medium consumers are captives of the licensed distribution companies. They cannot change their supplier in case of low reliability or poor quality service.
- The lack of competition among retailers and choice for small and medium consumers leads to regulation that is needed to protect them.

### What enabled retail competition to be possible?

Consumers (commercial, industrial or residential) have had little influence on the purchase of electricity and have no price information. Regulation has been unsuccessful in delivering low electricity prices. For decades in many countries including India and US, electricity has been delivered to consumers by a group of utility monopolies (state owned or private). When small-scale energy generation became feasible, the existing monopolies began to lose their large consumers because using new technology gas

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<sup>8</sup> Nunez, A. Liberalisation of Electricity Sector in European Union: Present State and Some Open Questions.



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turbines they were able to generate electricity more cheaply. Reduction in the optimum size of thermal power plants allowed participation of various firms without a loss of profits made from economies of scale. It also encourages large consumers to generate their own power<sup>9</sup>. Captive power plants came to be used by large industrial consumers in India as a source of reliable and cheap supply.

The ease with which small-scale generators can be absorbed in the transmission network and price effectiveness with larger scale units makes competition in generation segment economically viable.

### Characteristics of the Retail Competition Model

The basic model is characterized by the fact that it permits all consumers to choose their generator, either directly or through their choice of retailer. Generation is deregulated with free entrance and exit, and regulation does not impose capacity requirements on generators.

Similar to other sectors power retailers buy electricity in the wholesale package and market it to meet consumer demands. Their survival and profits depend on their capability to satisfy consumer preferences, consequently, promoting low prices and the development of new products to increase efficiency.

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<sup>9</sup> Black, B. 1994. A Proposal for Implementing Retail Competition in the Electricity Industry. The Electricity Journal, October.

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The unbundling of services usually supplied by a vertically integrated utility is an essential element for electricity markets in which end-users wish to tailor their service purchases to their service needs by choosing the sellers that are most able to provide those services<sup>10</sup>.

The retail model needs open access to all wires, both high voltage (transmission) and low voltage (distribution). The retail competition model separates the providing of wires from power service.

Customers may purchase their power either directly from the spot market or from one or several competing power retailers. The transportation and distribution companies supply wire services to market agents. Therefore, rules for open access to wires need to be established. In practice, however, going directly to the spot market is feasible only for large consumers, able to obtain the information required and to afford the transaction costs involved. Small and medium-size consumers are more likely to either aggregate their demands, if the system allows for this option, or use the services of a retail firm<sup>11</sup>.

Retail companies compete within the service territory formerly served by the local distribution company which remains the exclusive provider of wire services but is not allowed to compete with retail companies in supplying services like power retail and risk management.

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<sup>10</sup> Faruqui, A , and L. Kirsch. 1998. Unbundling Electric Discos Overseas and at Home. Public Utilities Fortnightly, April 1, 1998.

<sup>11</sup> Feunte, C and Baeto, P. 1999, Retail Competition in Electricity, Washington, D.C.

March 1999C N° IFM-118

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Both the generation and retail sale functions are deregulated and open to competition. Generating companies sell power to electricity retailers or directly to customers, instead of to a local distributor with a licensed monopoly. Power retailers or marketers would buy power from generators and sometimes resell it to retail customers, bundled with energy management services.

Licensed companies would provide transportation and distribution services in order to take advantage of economies of scale in these segments. However, these companies must provide open access or common carriage to all consumers, and are regulated to avoid monopolistic behaviour.

The retail model requires a spot market to enable multilateral trading. The spot markets make prices that calculate the marginal cost in absolute time, thus spot prices are variable over time. Consumers, retailers or generators may be ready to pay a premium to decrease price volatility and enter into contracts that mitigate risk<sup>12</sup>.

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<sup>12</sup> Maulding, M. 1997. Retail Risk Management: Pricing Electricity to Manage Customer Risk. The Electricity Journal, June.

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## Pricing System for Transmission and Distribution Wire Services

Competitive retail needs open access to distribution and transmission wires. This in turn requires that prices must be set for both these services. They must also provide appropriate returns to the owners of the wires.

Independent companies should provide distribution and transmission services. This solves the problem of discrimination among different consumers and discourages cross-subsidies, which is a major concern of pure retail companies.<sup>13</sup>

There would be two types of fees, the access fee and the regular fee. The access fee covers the cost of having and accessing the network of wires available, or the right to use the existing transmission and distribution network. The regular fee reflects the marginal cost of transferring electricity through the existing network of wires<sup>14</sup>.

## Distribution and Retailing Separation:

Power retail and power distribution is two separate functions. Power retail is the business of buying power from generators or in the spot market and reselling it to final customers. Distribution is the service of carrying electricity from the transmission and distribution network to the consumer.

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13,14 Feunte, C and Baeto, P. 1999, Retail Competition in Electricity, Washington, D.C., March 1999C N° IFM118

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Distribution wires must be operated separately from retail because selling wire services (services that allows access to distribution network) will still be a monopolised and a regulated business, whereas retail is open to competition because a distribution utility providing both services may cross-subsidise and discriminate between consumers buying only wires and consumers buying both power and wires.

Allowing distribution companies in retailing may reduce market competition and increase market power of distribution companies as they may subsidise their retail consumers by levying a wire services charge higher than the cost to their captive consumers, or in cases of connection damage, the distribution company will have greater incentives to fix those servicing its own customers first. This sort of situations should be handled by regulators in order to prevent a failure of competition within their distribution territory.

The distribution company may also discriminate between both classes of customers. For example, in cases of wire damage, the distribution company will have greater incentives to fix those servicing its own customers first. This sort of situations should be handled by regulators in order to prevent a failure of competition. Nevertheless, most of the companies being restructured own the wires and sell the electricity at the retail level. This may be the reason that only a few customers seek retailers other than their distribution companies<sup>15</sup>.

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15 Oren, S., and D. Ray. 1997. Services in an Unbundled and Open Electricity Services. Marketplace. In S. Awerbuch (Editor). Allstair Preston.

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## Benefits of retail competition model:

Competition among retailers put an end to the captivity of consumers and the old idea of regulated monopoly, unavailability of choice which compelled consumers to abide by monopoly conditions, both in terms of high prices and low quality.

Retailers would often arbitrage the prices if they see that cost are not effectively reflected in the electricity tariffs, thus improving price efficiency. Arbitrage is taking advantage of the differences in prices of different places and purchasing from lower price area and selling to higher price area obtaining a marginal profit till the point no further profit can be made. The result of arbitrage is that now prices would be totally cost reflective.

Retail Companies would increase the number of different products and services which would increase consumer welfare. Unlike regulated distribution monopolies, these unregulated retail companies can profit from selling power or other products and services to consumers. Retail companies due to competition would differentiate their energy services. They may specialise, like in renewable energy to be sold to environmentally conscious or green consumers ready to pay higher prices in order to protect the environment<sup>16</sup>.

Competition would encourage all, retailers, distributors and generators to develop technologies to increase efficiency to lower costs and increase reliability of supply. Specialisation resulting from competition would further lower costs and raise consumer welfare.

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<sup>16</sup> Feunte, C and Baeto, P. 1999, Retail Competition in Electricity, Washington, D.C., March 1999C N° IFM-118

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As seen in other sectors like agriculture and banking, parties involved, especially the large consumers and power generating companies would be ready to pay a premium to hedge the risks and variability of price in the spot market and would engage in futures contracts to mitigate price volatility. Competition would lead to risk being borne by party who is able to manage it the best. Since the major source of risks are the fuel price fluctuations and changes in consumption patterns many types of derivatives contracts would be offered by companies resulting in effective risk management<sup>17</sup>.

## Conclusion

As seen with almost every other sector, free markets and competition, over the long term reduces costs, increases efficiency through innovation and leads to a lot of consumer welfare. Even in the power sector this has now become possible, however due to the nature of the industry ensuring fair competition is rather tricky and regulation is needed to make market competition work effectively and avoid concentration of market power. Retail competition is extremely feasible in Delhi, with three monopolies already existing in the distribution segment; the government can allow different and competing companies to retail power through the present distribution network. The existence of an active regulator like the Delhi Electricity Regulatory Commission would greatly help in protecting competition when actually applying a similar model as suggested in the study.

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17 Maulding, M. 1997. Retail Risk Management: Pricing Electricity to Manage Customer Risk. The Electricity Journal, June.

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“Imagine the elderly and the poor having a fixed energy bill rolled into their mortgage or rent. Imagine an electric service that could let consumers choose how much of their home power is generated by renewable resources. Imagine farmers negotiating an agreement that ties their electric bill to the prices for their crop. Imagine a business with offices in ten states, receiving a single monthly bill that consolidates all its energy costs. Imagine a meter you can read.”

–J. Skilling<sup>18</sup>.

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<sup>18</sup> Skilling, J. 1997. Testimony before the Committee on Energy and Natural, United States Senate, Hearing on Competitive Change in the Electric Power Industry.



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