



Survey related to Power Quality Issues in Indian Electricity Market

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ABSTRACT: Electricity is the catalyst in reducing social and spatial inequities by creating options and opportunities for better livelihoods, education, health system and other allied activities. It is vital to the sustenance and sustainability for faster and more inclusive growth. However, this growth strategy largely depends on affordable, accessible and available electricity to the consumers. In last two decades, the situation in India has improved drastically. Still according to World Energy Outlook (2010), the electrification rate in India is 66.3 percent; still 403.7 million populations are without electricity. Compared to China where only 8.1million populations are without electricity. In this regards, the turnaround in Delhi Power Sector Reform makes a case of special interest for India and other developing countries facing similar challenges. In this paper, in order to assess the level of consumer satisfaction with the services offered by the Distribution Companies viz. BSES Rajdhani Power Ltd. (BRPL), BSES Yamuna Power Ltd. (BYPL) and North Delhi Power Ltd. (NDPL), a Consumer Satisfaction cum Consumer Awareness Survey has been carried out among commercial consumers in Delhi. In this survey, 27 commercial consumers being serviced under Single Point Delivery (SPD) system were covered.

Key Words: Power Quality, Electricity market, consumer satisfaction, Consumer Awareness

I. INTRODUCTION

Delhi with per capita electricity consumption and domestic product of 1486.68 Kwh and Rs. 54821respectively is among the states having lowest BPL population. and Rs. 8167 , it is not surprising that Bihar is second only to Orissa with BPL population of 41.4 %. That is why annual per capita energy consumption is frequently used by economists to compare countries on the development scale. India has added more than 164508.80 MW over the installed capacity of 1362 MW at the time of independence and electrification of more than 480000 villages has been completed. In absolute terms the progress is impressive yet there are lots of grounds to be covered. The annual per capita electricity consumption in India is about 671.89 Kwh which is among the lowest in the world. Further, large number of villages still remains un-electrified. Even in the electrified villages the power supply is marred by frequent unscheduled power cuts there by stymieing the economic as well as socio growth.

Midnight of June 30th 2002, the management of three electricity distribution companies of Delhi was devolved to private management, was the culmination of the journey which had started with Government of NCT of Delhi bringing out a strategy paper on the

power sector reforms in Feb 1999. The gigantic process of privatization, crystallized in 28 months, was expedited by the newly elected Government of Delhi. The pivotal electoral impact of power situation was explicit during the run up to the election, when city witnessed widespread agitation in summers of 1998 on account of poor performance of Delhi Vidyut Board. But this reform would bring in the envisaged results, was a big question to be only answered by the passage of time. After seeing eight springs, the time is ripe to look at the decisions made in the past, evaluate them on the actual scale of performance so that the future course can be better planned.

The main stakeholders of the distribution sector can be broadly classified into six categories. These are (i) Consumers, (ii) Regulators, (iii) Government, (iv) Employees, (v) Society, (vi) Business associates (suppliers & other outsourced agencies).

The interests of each stakeholder are different from that of the other and are often inter-dependent. The consumers' major concern is reliable and quality power at competitive rates, error free billing, easy payment options & efficient complaint handling mechanism. Regulator (DERC) is interested in compliance with the regulations of DERC relating to billing, metering, tariff and performance standards.

Government wants success of the reforms. Employees aspire to have best working conditions & empowerment at all levels, develop & capitalize on the competencies and in the process contribute to the business. Society wants the business enterprise to be a responsible citizen and contribute towards community development and the business associates (suppliers & other outsourced agencies) can deliver to the chain if there is proper liaison with the agencies & compliance with terms & conditions of the agreement prompt payment mechanism & ensuring the best working environment, investor's safety. Business can be successful only when it addresses the concerns of each of the stakeholders adequately.

To improve the quality of supply, Delhi's Dis Coms have developed and implemented various initiatives like Outage Management System, Automatic Meter Reading System, Geographical Information System, SCADA and DMS. The customer care centers are fully networked with availability of total consumer records through online databases for improved consumer care. Consumer complaints and grievances are routed through automated workflow based service handling procedure. 100% Consumers bills are generated through online energy billing system resulting in timely and accurate bills delivery to consumers. Multiple payments modes have been generated at many touch points for the convenience of the consumers. Dis Coms are regularly complying with statutory requirements of Regulator for billing, metering, tariff, performance standards and aggregate revenue return reports. Investors' concerns have been taken care by improvement in billing efficiency and monthly collection and reduction in AT & C losses. Total IT enablement of HR and administrative functions including payroll, organizational management, handling all requests and grievances have helped in the employee satisfaction.

II. THE BENCHMARKING OF STANDARD OF PERFORMANCE

The DERC has successfully introduced the Standard of Performance to ensure the quality of service provided by the companies by setting the minimum standard. As found in the consumer survey, the companies have made improvement in quantitative terms but there exists variation in the achievement among the Dis Coms. The benchmarking of Standard of Performance would promote uniformity and peer learning across the distribution companies in the service and facilities, complaints resolution, such as billing cycle/single window complain process (one common complain number for Delhi), information dissemination to the consumer and timely bill delivery among other.

The benchmarking will enable appropriate dissemination and utilization of services and facilities by the providers and consumers. A time frame based two pronged approach as implemented in the reduction of Aggregate Technical and Commercial losses with incentive on exceeding and huge disincentive on non-performance based Standard of Performance model need to be implemented. For this regulatory commission would be needed to develop capability to scrutinize the performance of the service providers.

III. CONSUMER PARTICIPATION

The informed consumers make a better choice and are indispensable if the distribution sector is to be opened to the competitive markets. A serious lacunae in the present electricity frame work is the absence of many, strong, well informed & research based consumer groups who can argue before the Electricity Regulatory Commissions on equal terms with the large operators in the sectors. This is evident from the findings of consumer survey; awareness of the consumers about the Standard of Performance of Dis Coms is appalling. The 84% of the Delhiites are not aware of the existence of Consumer Complaint Redressal Forum. It is necessary that there are multi disciplinary (such as engineering, finance, public policy, environmentalist, sociologist, economist, etc) researches cum training cum educational centers in the regions that provide strong research & information support to the consumer groups. These groups must be supported for their efforts by the Regulatory Commissions. There is need to put in special effort for the consumer awareness program.

V. SURVEY RESULTS OF CONSUMER SATISFACTION AND AWARENESS

In order to assess the level of consumer satisfaction with the services offered by the Distribution Companies viz. BSES Rajdhani Power Ltd. (BRPL), BSES Yamuna Power Ltd. (BYPL) and North Delhi Power Ltd. (NDPL), we got a Consumer Satisfaction cum Consumer Awareness Survey carried out among commercial consumers in Delhi. In this survey, 27 commercial consumers being serviced under Single Point Delivery (SPD) system were covered.

The objective envisaged to be achieved from the survey were to ascertain the performance of the electricity distribution companies in Delhi on the following parameters:-

- (i) Specific problems pertaining to supply of power including voltage fluctuations, load shedding, metering, billing, time taken to give new Connection / disconnect /load enhancement/reduction etc.

- (ii) Awareness of Consumer on Complaint Redressal Mechanism and consumer Grievance forums.
- (iii) Effectiveness of Complaint Redressal Mechanism and Consumer Forums for Grievance Redressal.
- (iv) Perception of consumer on the quality of the existing Grievance Redressal Mechanism.
- (v) Overall satisfaction among consumers on the whole range of services provided by the DIS COM in the process of power distribution
- (vi) Opinion of the consumers about tariff in New Delhi.
- (vii) Awareness in consumers about Electricity Act 2003 and Standards of DERC.

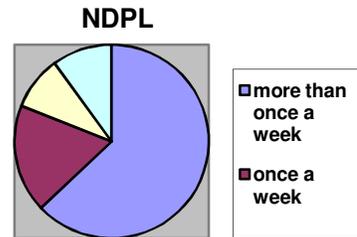
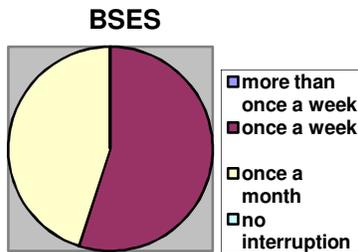
The survey was carried out in following area
 (i) Bawana, (ii) Narela, (iii) Magol Puri, (iv) Udyog Nagar, (v) Mundka, (vi) Rani khera and (vii) Mayapuri

A. Performance of Distribution Company

Through this survey we also tried to measure the quality of power supplied by the distribution companies in Delhi. India is yet to develop its power sector to meet international standards. None of the distribution companies in Delhi provide advance information about power cuts or shut down. Participants were not much satisfied with the performance of their Power Supplying Utility. The 150 participants were classified as follows

(a) Do you get interruption free electricity supply during summer season?

Dis Com	More than once a week	Once a week	Once a month	No interruption
BSES	0%	55%	45%	0%
NDPL	63%	18%	9%	10%



Our survey has revealed that performance BSES is better than NDPL. Consumers of BSES have less power interruption.

Now days in many countries the government is encouraging consumers to use Pre-paid meters. Studies have shown that consumers can be encouraged to use electricity judiciously and reduce wastage by prepaid metering. To charge the meter, consumer needs to buy electricity in advance according to his/her requirements. The consumer can buy electricity through various vending options. The vend results in a token with a code printed on it. The consumer punches the code into the meter either directly or through an in-home display using a key pad. The meter is credited with the amount

of credit bought and supply is switched on automatically at load side.

In Delhi, distribution companies are offering prepaid meters to consumers at Rs2600. BSES is offering a 5% discount on electricity bill if the consumer is using prepaid meter.

But in this survey most of the people were still unaware of prepaid meters. Most of the participants were using Electronic meters. 90% of the participants were using Electronic meters while 10% were using conventional electromechanical meter. DERC is planning to make prepaid metering mandatory during peak load (day time).

(b) Do you receive advance information about power cuts/shut downs?

Dis Com	Yes	No
BSES	0%	100%
NDPL	52%	48%



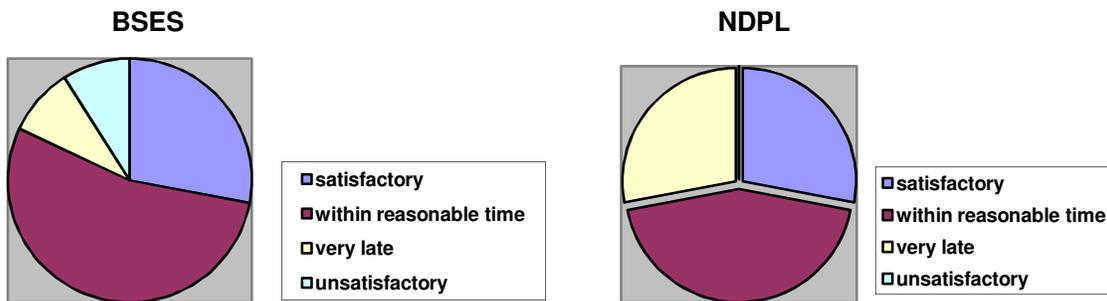
The electromechanical meter has had predominance in the metering of energy consumption using AC supply system. Electronic meters have gained popularity because of the possibility of remote reading and controllable non uniform rate of billing. The performance of electronic meter is better than electromechanical energy meter for light loads. The consumer satisfaction with the meter installed is an important criterion for the development of the power sector and achieving stability in Power Sector.

In this survey most of the people were partially satisfied with the meter installed at their locality. Around 90% people were partially satisfied with the meter they are using while 8% were fully satisfied and remaining 2% were unsatisfied.

Our survey revealed that NDPL takes lesser time to clear the fault and restores supply to the consumer premises at a faster rate than BSES.

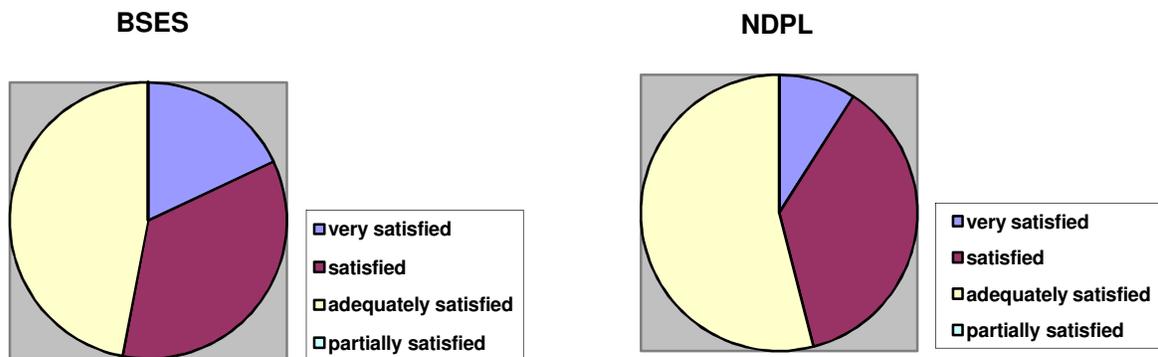
(c) What response do you get from the power supply company in case of power failure at you location?

Dis Com	satisfactory	Within reasonable time	Very late	unsatisfactory
BSES	28%	54%	9%	9%
NDPL	28%	44%	28%	0%



(d) Are you satisfied with the performance of the meter installed in you locality?

Dis Com	Very satisfied	satisfied	Adequately satisfied	Partially satisfied
BSES	18%	35%	47%	0%
NDPL	9%	37%	54%	0%



In this survey participant's having higher sanctioned load seemed to be more unsatisfied with the performance of meter. Therefore it is advisable to get meter tested at regular intervals. DERC has also fixed standards for meter testing which includes specifications which the meter must satisfy along with cost of testing to be charged by the distribution company for meter testing. Any domestic consumer can get his/her meter tested on any day by paying Rs. 25.

It is the duty of the distribution company or the licensees to get meters tested by themselves at regular intervals and submit report of the performance of meters to the DERC. The licensee shall observe following time schedules for regular meter testing. Though DERC has made standards and regulations but in this survey most of the participant's complaint and were not satisfied with the performance of the meter and also complaint that the distribution company did not perform meter testing at regular interval as per norms laid down by DERC.

In case meter is found burnt at the consumer premises then as per DERC norms the distribution company shall restore connection within six hours of receiving the complaint and a new meter shall be restored within 3 days. After inspecting the site if electrical inspector finds that the meter was burnt due to tampering of wires by consumer or due to falling water in the consumer premises etc, then the consumer shall bear the cost of the new meter. If the meter is burnt due to voltage fluctuations, transients etc then Distribution Company shall bear the cost of installing the new at the consumer premises.

B. Complaint and Grievance Handling

Distribution Company should conduct public awareness campaigns to make people aware of the grievance handling forums and should educated people about modes by which they can submit a complaint. Participant's also believed that personal visit to the office was most effective way of submitting a complaint as compared to the email, calling on toll free number etc.

(a) Have you ever registered a complaint with the utility about meter?

Dis Com	yes	no
BSES	8%	92%
NDPL	9%	91%

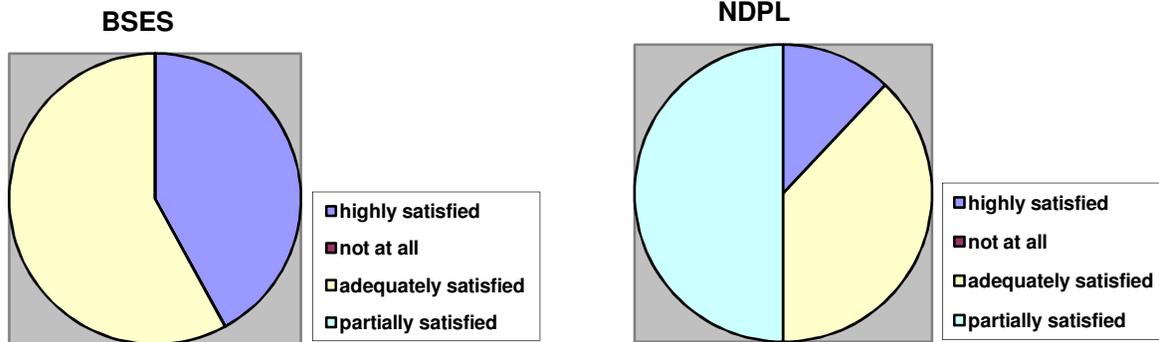


After submitting the complaint 9% of the participants were satisfied with the time and measure taken by Power Utility officials to resolve the issue ,71% of the

participants were partially satisfied while 20% of the participants were not satisfied with the response of the Power supplying Utility officials.

(b) Were you satisfied with the response of Distribution Company?

Dis Com	Highly satisfied	Adequately satisfied	Partially satisfied	Not at all
BSES	42%	58%	0%	0%
NDPL	12%	38%	50%	0%

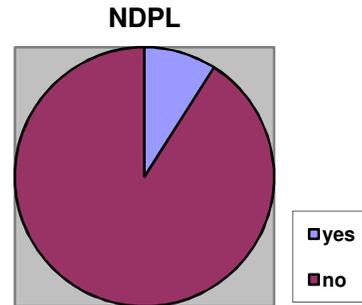
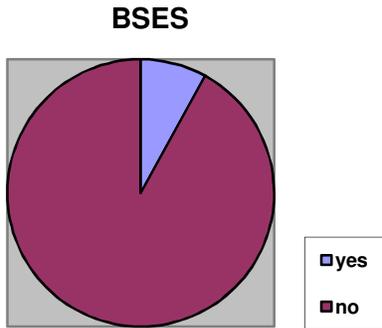


DERC has specified time within which the Distribution Company will have to resolve the issues of consumer based on the nature of complaint.

S. No.	Nature of complaint	Time to be taken by licensee
1	Complaint on billing	Licensee shall acknowledge the complaint immediately, if received in person, or within three days from the date of receipt if received by post. If no additional information is required, Licensee shall resolve the complaint and intimate the result to the consumer within fifteen days of receipt of the complaint. In case any additional information is required, the same shall be obtained, the issue resolved and result intimated to the consumer within thirty days of receipt of the complaint
2	Final bill on vacation or change of premises	The consumer shall make a request to the Licensee for a special reading at least seven days in advance before the premises are to be vacated or change of occupancy and the Licensee shall arrange for a final bill to be delivered, including arrears if any, at least three days before the vacation of the premises or change of occupancy. It is the consumer's responsibility to make the payment before the vacation of the premises.
3	Non payment of dues by the consumer	Licensee to give fifteen days notice to pay the dues and if not paid, the Licensee may disconnect the Consumer's installation on the expiry of the notice period.
4	Consumer for reconnection	Licensee shall reconnect the consumer's installation within two days of payment of past dues along with reconnection charges and Service Line charges, wherever applicable, Dormant connections would be reconnected only after all formalities as required in the case of new connections is complied with.
5	Consumer wanting disconnection	Licensee to carry out special reading and prepare final bill, including all arrears upto the date of billing, within five days of receiving such request.

(c) Are you aware of complaint redressal forums?

Dis Com	Yes	No
BSES	8%	92%
NDPL	9%	91%



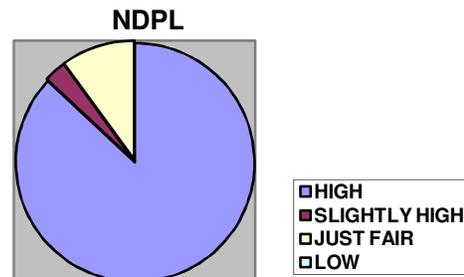
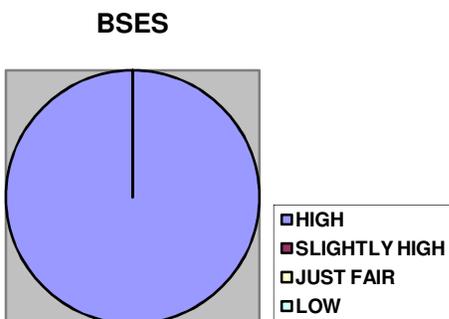
C. Reasonability of Tariff and other Services

Tariff or cost of electricity per KW paid by consumer to the Distribution Company influences his satisfaction to a large extent. In Delhi few years ago Government established DERC to regulated Tariff and withdrew subsidy from domestic consumer which increased tariff.

In this survey, participants complaint that the tariff they were paying was slightly high. DERC has raised tariff in Delhi mainly because of high T&D losses and high cost of generation which was made Distribution Companies to run in loss at previous tariff.

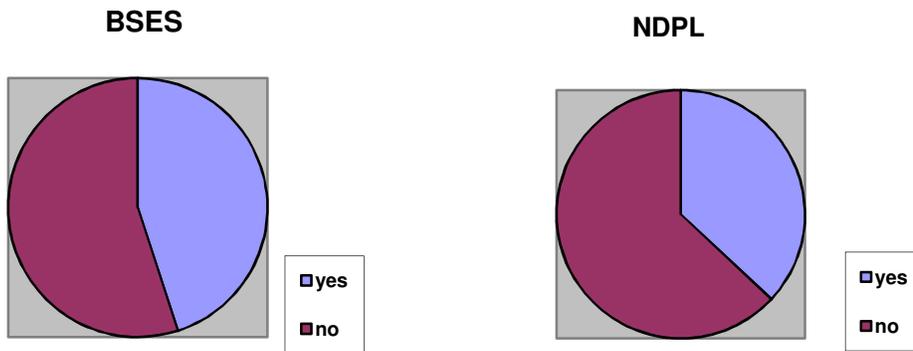
(a) What is your opinion about the tariff you are paying?

Dis Com	HIGH	SLIGHTLY HIGH	JUST FAIR	LOW
BSES	100%	0%	0%	0%
NDPL	87	3%	10%	0%



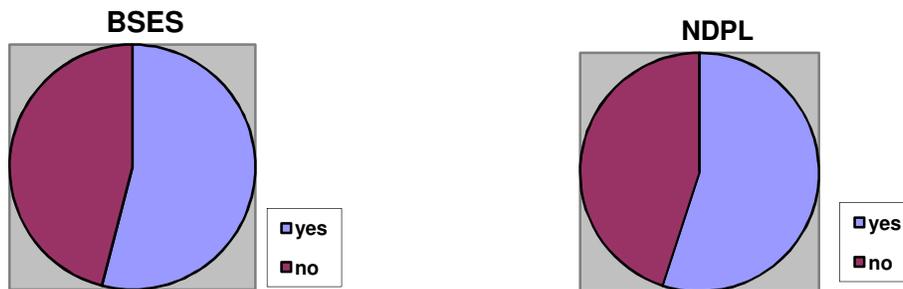
(b) Would you like to consume more electricity if some rebate is given on present tariff?

Dis Com	Yes	No
BSES	45%	55%
NDPL	37%	63%



(c) Are you willing to pay more tariffs for environment friendly produced energy?

Dis Com	Yes	No
BSES	54%	46%
NDPL	55%	45%



- i) Regulatory commissions are empowered to determine the tariff for
 - Supply of electricity(min and max ceilings are fixed)
 - Transmission
 - Wheeling
 - Retail sale(max ceiling alone is fixed)
- ii) Regulatory commissions may determine Multi Year Tariff which rewards efficiency
- iii) There are 2 ways to determine tariffs
 - Based on tariff principle prescribed by CERC
 - Competitive bidding, purely market based.

- Indian Supply Act 1948
- Electricity Regulation Commission Act 1998
- Electricity Act 2003 (replaces all the above acts)

Electricity Act 2003 is an act 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, regulation commissions and establishment of appellate.

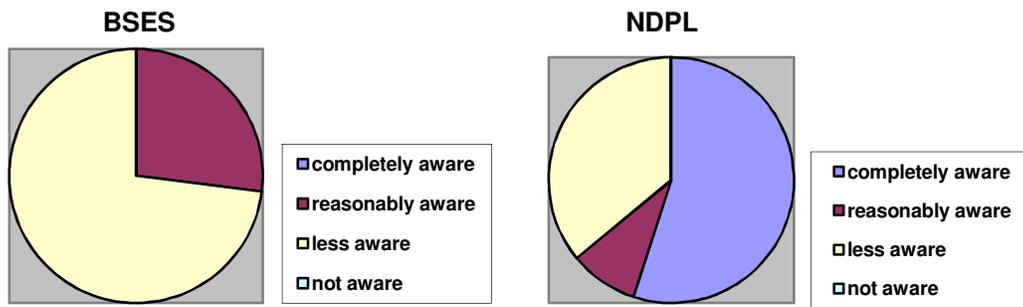
D. Consumer Awareness

From this survey, it can be concluded that almost participants were unaware electricity acts like

- Indian Electricity Act 2010

(a) Are you aware of the unbundling of DVB or other power sector reforms?

Dis Com	Completely aware	Reasonably aware	Less aware	Not aware
BSES	0%	27%	73%	0%
NDPL	55%	9%	36%	0%



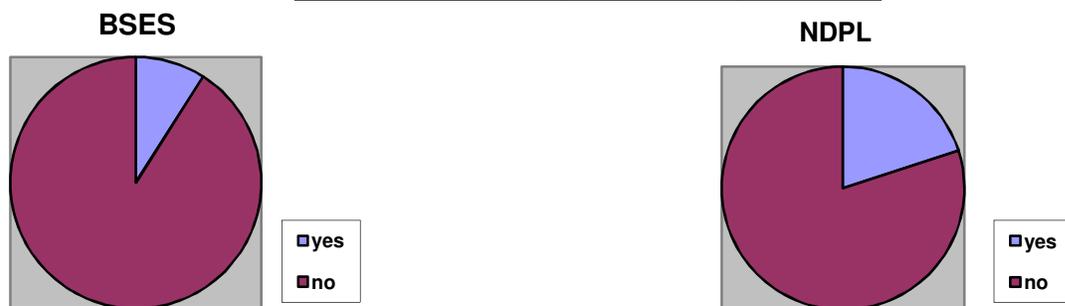
(b) Do you about Consumer Awareness programs?

Dis Com	yes	no
BSES	9%	91%
NDPL	0%	100%



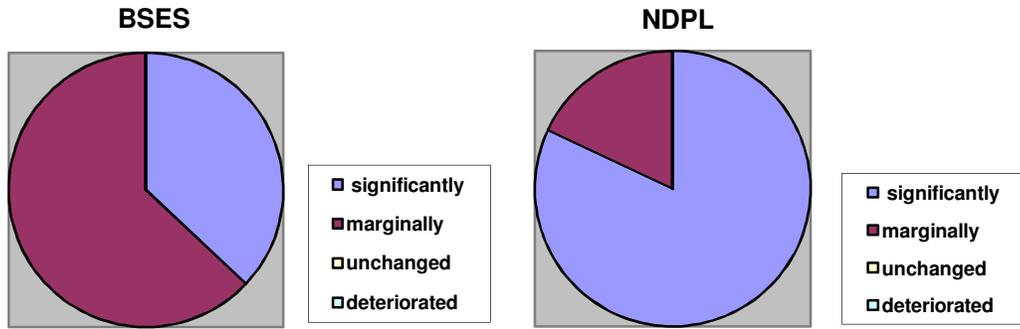
(c) Are you aware of DERC standards for distribution companies?

Dis Com	Yes	No
BSES	9%	91%
NDPL	22%	88%



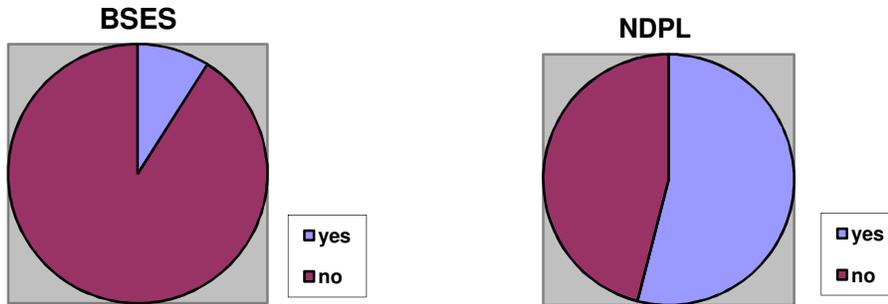
(d) In your opinion has the quality and service of supply of electricity has improved in last 5years?

Dis Com	Improved significantly	Improved marginally	Unchanged	Deteriorated
BSES	37%	63%	0%	0%
NDPL	82%	18%	0%	0%



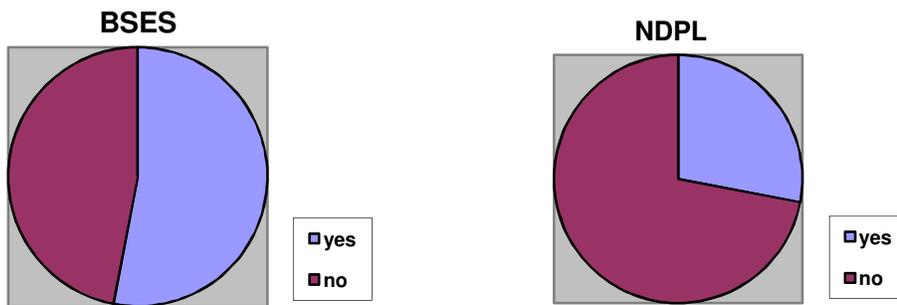
(e) Are you affected by equipment damage due to overload or poor supply?

Dis Com	Yes	No
BSES	9%	91%
NDPL	54%	46%



(f) Do you have reserve units to support the plant or part of the plant?

Dis Com	Yes	No
BSES	53%	47%
NDPL	28%	72%



VI. CONCLUSION

From this survey participants showed disappointment with the current performance of Distribution Companies. Participants were unaware of the complaint forums and were not happy with the overall functioning and decisions taken by complaint redressal forums. Apart from disappointment with the performance of Distribution companies, participants were also unaware

of DERC norms and provisions made in Electricity Acts by the Government of India. To make consumers more aware and satisfied with the performance of Distribution Companies, DERC should organize more and more consumer awareness programs. DERC shall also monitor the complaints submitted by consumers and should set up a body to cross examine the decisions made by these Consumer Complaint Redressal Forums.

Participants showed concerned about the tariff they are paying currently. Therefore measures should be taken to lower down tariff in Delhi. To reduce tariff, technology needs to be upgraded i.e. to reduce T&D losses, thefts and high cost of manufacturing. Providing higher subsidy than that currently given by the government on solar panels can help in reduce tariff and can also help in development of country by making power system of the country more stable. Consumers in Delhi were satisfied with the result of privatization of distribution companies. From this survey, it can be concluded that consumers in Delhi need reduction in tariff. I personally feel that after this survey the norms or regulation formulated by DERC for distribution companies are more consumer friendly but consumer are not aware of their right given by DERC and Government of India in various electricity acts passed by parliament. The results of the survey also revealed that much of the regulation laid down by DERC are not followed by Power Supplying Utilities at ground level, hence DERC must monitor that the Power Supplying Utilities in Delhi follow all rules and regulation of DERC.

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