



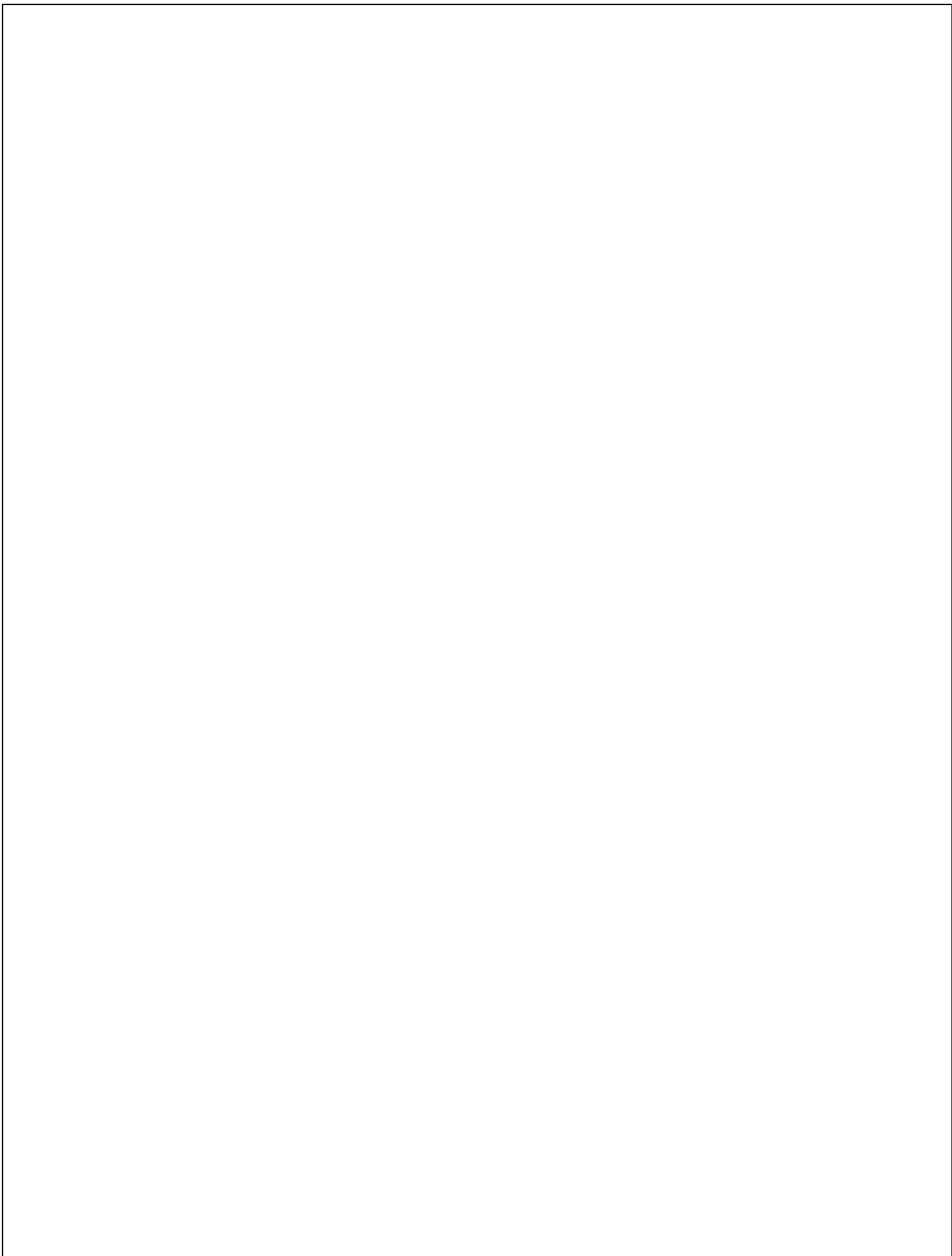
GURGAON FIRST
RECHARGE REFLECT RESOLVE

D4/29 Ground Floor, DLF Phase I
Gurgaon-122002, Haryana, India

www.gurgaonfirst.org



Gurgaon's Power Distribution Sector Assessment Report - 2013



Objective of the Report:

Gurgaon produces almost 99% of all automobiles in Haryana. The annual revenue from sales and purchase of property is about Rs 900 crore, way ahead of other cities. Gurgaon attracts 78% of the Foreign Direct Investment that flows into Haryana. Nearly 300 of the Fortune 500 companies have a corporate presence in Gurgaon. Almost all of Haryana's IT and BPO business resides here, touted as the best city to work and live in India by Business Today in 2011. Despite all this, the millennium city's electricity standards by way of quality or reliability of supply are nowhere in comparison to adjacent Delhi where residents enjoy reliable power and better customer service.

The objective of this report is to

- a) Research key statistics pertaining to DHBVN's Gurgaon circle electricity distribution business.
- b) Highlight major issues confronting Gurgaon's electricity distribution sector
- c) Propose initiatives and announcements of Improvement in Gurgaon's electricity transmission & distribution network
- d) Throw light on the status of solar power projects and its implementation in Gurgaon.
- e) Suggest possibilities for revamping Gurgaon's electricity sector and steps for successful adaptation of solar power in Gurgaon.

CONTENTS

- 1. Executive Summary and Key Recommendation**
- 2. Chapter1: Gurgaon Circle Distribution Statistics**
 - a. Population : Key Trends
 - b. Electricity Overview
 - c. Executive Setup at DHBVN
 - d. Contribution in DHBVNL Pie
 - e. Consumer Profile and Growth Pattern
 - f. Load & Revenue Profile
 - g. Tariff Structure
 - h. Captive Power Growth
 - i. How DHBVN gets its Power Supply?
 - j. Distribution Infrastructure
 - k. Operational Performance
 - l. R-APDRP
 - m. Some Recent Announcements.
- 3. Chapter2: Status and Implementation of Solar in Gurgaon**
 - a. Renewable energy
 - b. Solar City
 - c. Projects - Utility Scale/Grid Connected & Roof top/Off Grid
 - d. SWH & Small Scale Applications of Solar in Gurgaon
 - e. Conclusion
- 4. Chapter3: Way Forward**
- 5. Chapter4: Key Indicators & Comparative Analysis vis-à-vis other circles**
- 6. Contact details: DHBVN**

Executive Summary

- **Gurgaon is facing acute power shortages:** The total electricity demand of Gurgaon circle during peak time is around 1000-1100 MW. Average demand and supply of electricity for Gurgaon stands at 800 MW-900 MW and 650MW -750MW. Each year Gurgaon's power demand is growing at the rate 15 percent to 20 percent thereby increasing the peak demand as well as the power deficit. It is estimated that the peak demand deficit is in the order of 30 percent and the average power deficit will be around 15 per cent. Gurgaon is facing an average power cut of 2-3 hrs/day with a peak cut of 7-8hrs/day during peak seasons.
- **The city's load profile is dominated by commercial and industrial segments:** Gurgaon circle contributes one third of the total load of Dakshin Haryana Bijli Vitaran Nigam (DHBVN). The notable aspect is 72 percent of commercial load under DHBVN comes from Gurgaon circle alone. Gurgaon's peak load consumption stands at 18 million units and off peak load consumption stands at 15-16 million units. The load profile of Gurgaon circle is as follows, 31.6 percent of load coming from domestic segment, 32.9 percent from commercial segment, and 30.9 percent comes from industrial segment and 3.9 percent from the agriculture segment and 0.7 percent from others.
- **Gurgaon's contributes handsomely to overall revenue:** Gurgaon circle contributes 40.4 per cent of DHBVN's total revenues. The revenue profile of Gurgaon circle is as follows -- 20.9 per cent of revenue comes from domestic segment, 32.4 per cent from commercial segment, 44.9 per cent comes from industrial segment and 0.4 per cent from the agriculture segment and 1.4 per cent from others. Revenue realization of entire Gurgaon circle stands at 100 percent which indicates that DHBVN able to realise whatever revenue it assessed.
- **Gurgaon witnesses moderate losses:** Gurgaon circle as a whole has the AT&C losses of 12.8 per cent, while Line losses stand at 15.88 per cent. In contrast DHBVN's average AT&C and Line loss are 22.85 per cent and 23.47 percent respectively. AT&C losses for Gurgaon circle as a whole looks very impressive figure but one of the division within the circle faces AT&C losses as high as 83 per cent.
- **Gurgaon has poor distribution level metering:** In terms of metering, Gurgaon circle has 100 per cent coverage at the feeder level as well as domestic and industrial consumers. For agricultural consumers, with 17079 meters installed, the coverage is 60 per cent. However, the metering for distribution transformers is poor at 8.67 per cent. Out of the total meters installed the proportion of electronic meters stands at 84.4 percent and electromechanical meters stands at 9.85 percent
- **Power theft is a key concern:** Theft in Gurgaon circle is a major concern, out of 7517 connections checked during the month of April-August 2012, theft was detected in 1920 cases. That means in 26 percent of cases theft was detected. Penalty of Rs 780 lakhs was imposed and Rs 334.30 lakhs was recovered. The percentage penalty recovery stands at 42.85 percent

- **DG sets make up for inadequate supply** : There is around 2000 MW of DG capacity is installed in Gurgaon circle, almost 20% of the total capacity installed is in the residential group housing sector whereas commercial & industrial comprises of 80% of the total DG capacity installed.
- **Solar is yet to make its mark**: Till 2012, the total installed solar power capacity in Gurgaon is around 3.28 MW in which 3 MW is grid connected and 0.28 MW is off- grid. As per solar experts, the city's potential for roof top solar installations will be 200 MW. Much attention has to be paid to improve the utilization of solar power in Gurgaon.

Key Recommendations:

- **Making organisational Changes at DHBVNL:** If Gurgaon cannot be given under franchisee system yet, its organisational effectiveness must improve. The current systems and operating management style are quite old and need improvement. The staff motivational levels also have to be improved to improve performance and reduce theft.
- **Adopting Right Technologies:** DHBVN shall deploy technologies like Distribution management systems in “Gurgaon-City division” and “Gurgaon-Sub urban division” to improve the quality and reliability of the power supply. Besides, **Demand side management (DSM)** will help in reducing the peak demand, enhancing the quality of the power supply and improves consumer satisfaction. Some of the initiatives like SMS based fault management system, Outage management systems, Unmanned grid substations & Geographic information systems(GIS),Automatic meter reading (AMR) for high revenue consumers shall be implemented in Gurgaon-City division and Gurgaon-Sub urban division in order to improve reliability and customer satisfaction. Implementation of High voltage distribution systems (HVDS) and LT ABC (Aerial bunched conductor) will help in theft reduction
- **Controlling theft and other losses:** These problems can be reduced by improving HT:LT mix, by improving metering, strengthening infrastructure and by reducing billing errors. To reduce losses and theft, DHBVN can think about franchising some of the divisions or some of the division’s operations to private players.
- **Augmenting power supply:** DHBVNL has to tap more sources of power into its supply. Besides, captive power generators in factories and apartment complexes can be asked to sell additional power to the grid supply power during peak demand. In order to facilitate this, new policy framework need to be crafted and Distribution infrastructure need to be strengthened.
- **Encouraging Solar:** Gurgaon’s public offices (MCG, HUDA etc) get an additional subsidy of 40 per cent on top of a 30 per cent subsidy from MNRE for putting solar projects. They should put up some “show case” projects to promote solar. There must be policies that mandate new commercial buildings and residential complexes in Gurgaon to mandatorily have some part of their electricity needs met by solar. Energy auditing has to be made mandatory for these buildings, so that efficient usage of electricity will be made as a practice. Lastly, the state government can introduce net metering scheme for grid connected rooftop projects. This will enable the captive power consumers to feed excess energy (if any) into the grid and help distribution utilities in reducing their demand-supply deficit and benefit customers through reduction in energy bills.

Chapter1: Gurgaon Circle Distribution Statistics

Gurgaon's Population : Key Trends

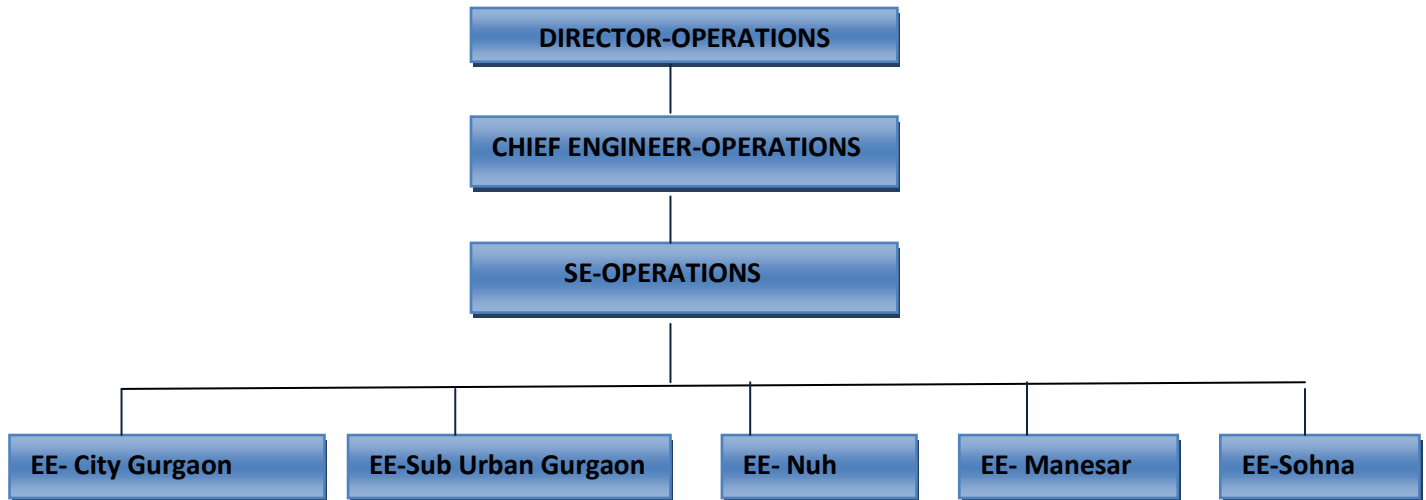
- Gurgaon's total area is about 1215 sq.km. It has a total population of 1.51million which is 5.97% of Haryana's population. Gurgaon's population comprises 68.82% urban population and 31.18% rural population, exactly opposite to Haryanas's population pattern (excluding Gurgaon).
- Gurgaon's population has grown by 73% in 2011 from 2001; growth rate in urban area is more than the rural population growth rate.
- During the same period- from 2001 to 2011, the population density witnessed a dramatic rise from 717people/sq.km to 1,217people/sq.km.

Gurgaon's Electricity Overview

- After the restructuring of the Haryana State Electricity Board in1998, Gurgaon gets its electricity supply from Dakshin Haryana Bijli Vitaran Nigam Limited (DHBVN) which supplies to the entire South Haryana comprising of Sirsa, Fatehabad, Hisar, Bhiwani, Mahendragarh, Rewari, Gurgaon, Mewat, Palwal and Faridabad districts. Rest of Haryana gets its supply from Uttar Haryana Bijli Vidyut Nigam Limited (UHBVN). Dakshin Haryana Bijli Vitran Nigam Limited is a 100% Government of Haryana owned and controlled company
- DHBVN covers two electricity distribution zones namely Delhi Zone and Hisar Zone. Delhi Zone comprises of four distribution circles which includes Gurgaon.
- The Gurgaon circle comprises of five major distribution areas:
 - City Gurgaon
 - Sub-urban Gurgaon
 - Manesar
 - Nuh and
 - Sohna

Executive Setup at DHBVN

- The superintending Engineer of Gurgaon circle is responsible for the entire distribution operations of Gurgaon area who in turn reports to Chief Engineer of DHBVN. Refer below for detailed organization structure.



EE: Executive Engineer

SE: Superintending Engineer

- Total sanctioned human resources for Gurgaon circle is 1795 people. In reality, 854 work as DHBVN staff while 800 positions are filled by contract staff. There is a shortfall of 141 employees. Total officers sanctioned are 22, out of which 20 are filled and other two positions are vacant.

Gurgaon Circle contribution in DHBVNL Pie

- Overall Gurgaon circle contributes 34% of DHBVN's load; the note able aspect in this load share is the amount of contribution made by commercial customers which is around 72% of total DHBVN's commercial segment load.

Connected Load in KW as on July 2012			
Category	Gurgaon	DHBVN	Gurgn. Share %
Domestic	1088263	2962581	36.7%
Non-Domestic	1061286	1478640	71.8%
Industrial	1069171	3299602	32.4%
Agriculture	134280	2210369	6.1%
Total	3476387	10266278	33.9%

- In 2011-12 Gurgaon circle's pie in the total revenue of DHBVN is 40.4%, Gurgaon circle is also one of the segments which is having the collection efficiency average of 103%. It has the lowest AT&C losses of 12.83%, within DHBVN while Line losses stand at 15.88%. In contrast DHBVN's average AT&C and Line loss are 22.85% and 23.47% respectively. It is also one of the major profitable circles in DHBVN's distribution business because of its high commercial and industrial customers along with very low percentage of agricultural customers.
- However, the total electricity demand of Gurgaon circle during peak time is around 1000-1100MW. Average demand and supply of electricity for Gurgaon stands at 800MW-900MW and 650MW -750MW. Approximately there is average power deficit of 18% and peak deficit of 35%

AT&C Losses and Line Losses		
	Gurgaon	DHBVN
Line losses (%)	15.88%	23.47%
AT&C losses (%)	12.83%	22.85%

- Each year Gurgaon's power demand is growing at the rate 15% to 20% thereby increasing the peak demand as well as the power deficit. It is estimated that the peak demand deficit is in the order of 30% and the average power deficit will be around 15%.
- In 2011, DHBVN supplied around 155-160 lakh units per day to Gurgaon circle in off peak time, during peak time it's around 175-180lakh units per day.
- Currently Gurgaon is facing an average power cut of 2-3 hrs/day with a peak cut of 7-8hrs/day during the peak electricity demand.
- The back- up requirement is met mostly with the help of Diesel Generators. Overall there is around 2000 MW capacity DG installed in the total Gurgaon circle, almost 20% of the total capacity installed is in the residential group housing sector whereas commercial & industrial comprises of 80% of the total DG capacity installed. All the commercial complexes are having about 100 % Diesel Generator back-up while industrial sectors are having more than 100% DG back-up because the load which is not sanctioned by DHBVN is also supplied by DG's along with the back-up power.

Gurgaon Circle - Consumer Profile and Growth Pattern

- The total number of connections under Gurgaon circle until September 2012 is around 4,37,466. The major amount of growth is contributed by domestic connections (17%), followed by Industries (10%) and commercial segment (non-domestic) growth at 2% where as the agriculture and others sector registering a negative growth of -17% and -31% respectively.

Connections Growth Rate- Gurgaon circle						
Category	No. of New Connections added (Y-o-Y)			Total No. of Connections till Sep 2011	Total No. of Connections till Sep 2012	CAGR % (2009-2012)
	2009-10	2010-11	2011-12			
Domestic	18243	21042	29568	321933	344773	17
Non-Domestic	3228	3675	3415	48209	49038	2
Industrial	731	976	977	12074	12407	10
Agriculture	964	218	544	28528	28683	-17
Others	289	118	97	2581	2565	-31
Total	23455	26029	34601	413325	437466	14

Source: DHBVN

Gurgaon Circle – Load & Revenue Profile

- In 2011-12 major portion of the electrical load (or consumption) in Gurgaon circle is attributed by commercial segment which is about 33%, followed by 32% of industrial consumers and 32% by domestic consumers.

Consumers Share in Load and Revenue - Gurgaon Circle						
Category	Connection Share % in 2011	Connection Share % in 2012	Load (KW) in 2012	Load Share % in 2012	Revenue in Rs. Lakhs	Revenue Share (2011-12)
Domestic	77.9%	78.8%	1104506	31.6%	27056.04	20.9%
Non-Domestic	11.7%	11.2%	1148405	32.9%	42054.40	32.4%
Industrial	2.9%	2.8%	1076668	30.9%	58234.46	44.9%
Agriculture	6.9%	6.6%	134700	3.9%	456.09	0.4%
Others	0.6%	0.6%	25671	0.7%	1837.40	1.4%

- Of Gurgaon's total revenue of Rs.1294.6crores, Industrial segment contributes 45% i.e. Rs.583.4crores, followed by commercial connections with 32.4% ,domestic segment of 21% and agriculture customers contributing only 0.4% of the revenue.

Gurgaon Circle – Tariff Structure

- In Gurgaon, even though the consumption or the load among industrial, commercial and domestic customers are in the common level of 30 to 33% there is a vast difference between there revenue contribution.
- One of the major reasons for this skewed revenue share is the variations is the tariff between different type of consumers. The maximum tariff per unit is paid by the commercial customer, then by industries and domestic customers.
- Like most parts of India, in Gurgaon circle too, agriculture power supply is subsidized. The farmers pay around Rs. 2.25/unit. Commercial and industrials revenue are cross subsidizing the domestic and agriculture segments.

Gurgaon Circle Electricity Tariff as on April 2012				
Category	Domestic	Commercial	Industrial	Agriculture
Rs./unit	4.82	5.45	4.88	2.25

Contribution of Gurgaon Circle (Apr-Mar 2011-12)				
	Units (in Crores)		Revenue (Rs. Crores)	
	Received	Billed	Assesed	Realised
Gurgaon	520.21	437.61	2039.32	2133.24
DHBVN	1786.24	1366.93	5233.64	5276.28
Gurgaon's Contribution	29.1%	32.0%	39.0%	40.4%

Captive Power Growth

Huge power deficits lead to the installation of captive Diesel Generators primarily in high rise housings, commercial buildings and Industries. As on 2010, the total installed DG capacity in and around Gurgaon-Manesar is 2000 MW, of which almost 70% is in industries and commercial establishments.

How DHBVN gets its Power Supply?

- Apart from DHBVNL, the other entities in Haryana's power sector are for the Generation of Power Haryana Power Generation Company Limited (HPGCL) and Haryana Vidyut Prasaran Nigam Limited (HVPNL) for the Transmission.
- The HVPN procures power on behalf of DHBVN from central generating stations and other external sources apart from the power made available by the HPGCL from state generating stations. The shortage in supply due to excess demand is met through various short-term sources- Power Trading Corporation and other trading sources. The total projections from external and internal sources of Haryana have been projected to be at 53854.07 MU for FY 2012-13.

Chief Sources	DHBVN
Internal Sources	a. PTPS, Panipat b. DCRTP, Yamuna Nagar c. RGTPS, Khedar (Hisar) d. WJCPSC, (Hydel)
External Sources	(a) NTPC, (b) NHPC, (c) NPCIL , (d) Co-generation, (e) Short-term power arrangements: PTC, NVVNL, ADANI, TATA, REL etc.

Distribution Infrastructure: Gurgaon Circle

- As of October'12, Gurgaon's distribution line length stood at 1581. km. Nearly 56 per cent was at the LT level and 43 per cent at the HT level. Line length increased by a marginal 1.68 per cent over the previous year.
- Transformer capacity stood at 1154046KVA in 2012-13, registering an increase of 3.36 per cent as compared to the previous year. The network has 39 substations as of October 2012, all of which are at the 33 kV & 66kV level. Number of substations has increased by a marginal 3 percent over the previous year.

Distribution Line Length(In Km)

Voltage level	2011-12	2012-13	% Change
33 kV	38	48.6	23.25
11 kV	6672	6902	3.45%
LT	8899	8921	0.25%
Total	15609	15871	1.68%

Number of Substations

Voltage level	2011-12	2012-13	% Change
33 kV	4	4	0
66 kV	34	35	3%
Total	38	39	3%

Transformer Capacity

	2011-12	2012-13	% Change
33 kV	49.5MVA	49.5MVA	0
11 kV	1116MVA	1154MVA	3.36

Operational Performance

Distribution Losses

	2011-12	2012-13
Distribution losses (%)	15.88	13.78
AT&C losses (%)	12.83	11.58

- Gurgaon's AT&C losses during 2012-13 stood at 11.58 per cent while the distribution loss alone was 13.78 per cent. AT&C losses declined marginally by 1.25 percentage points in 2012-13 while distribution loss fell by 2.1 percentage points lower than in the previous year.

Metering & Theft

- In terms of metering, the DISCOM has 100 per cent coverage at the feeder level as well as domestic and industrial consumers. For agricultural consumers, with 17079 meters installed, the coverage is 60 per cent. However, the metering for distribution transformers is poor at 8.67 per cent.

Category	Total number of meters installed	Metering percentage (%)
Feeders	804	100.00
Domestic Consumers	393555	100.00
Industrial Consumers	12665	100.00
Agricultural Consumers	17079	60
Distribution Transformers	1380	8.67

Type	Number of meters in network	Percentage share (%)
Electronic meters	383318	84.4
Electromechanical meters (or others)	44723	9.85

Detection of Theft in Gurgaon circle					
Period	No. of Connections Checked	Theft Detected	Penalty imposed (Rs. Lakhs)	Penalty Recovered (Rs. Lakhs)	%age Recovery
April-Aug' 12	7517	1920	780.17	334.30	42.85%

R-APDRP

- Restructured–Accelerated Power Development and Reforms Programme (R-APDRP) was launched by the Ministry of Power as a central sector scheme for improving the urban power distribution sector in the country with Power Finance Corporation (PFC) as the nodal agency for its operationalisation and implementation.
- A total of 36 towns are eligible from Haryana, 20 from UHBN and 16 from DHBVN. Total sanctioned cost for implementing Part-A(IT), Part-A(SCADA) and Part-B implementation is Rs.840 Cr but as of now 50 crores has been disbursed for Part-A(IT) implementation. Though the PFC has sanctioned the amount February '09 but DISCOMS are not willing to take from PFC.
- Haryana is one of the few states that got amount sanctioned and approved. The Contract for implementing IT has been awarded to HCL Tech. on 23.11.12, that is after a period of 4 years from the date of sanction. As per R-APDRP guidelines if Part-A is completed within three years from the date of sanctioning of the project the sanctioned amount would be converted into grants from loans, which DISCOMS failed to avail this provision because of the delay in awarding the project IT implanting agency.
- Out of total Rs.166 Cr. Sanctioned for Part-A (IT) only Rs.12.5 Cr. has been sanctioned for Gurgaon, out of this amount only Rs.3.75 Cr. has been disbursed so far. Gurgaon is not eligible for Part-A(SCADA) funding and Part-B funding.

Future Investments in Sprucing Generation and Distribution: Some Recent Announcements.

Transmission & Distribution:

- It was announced in 2012 that under the World Bank project DHBVN plans to spend Rs.150 crores in Gurgaon by March 2014 on **capacity addition in the distribution systems** on bifurcation/trifurcation of overloaded feeders and addition of distribution transformers. Also it is planning for the augmentation of transmission lines by adding 156.65km and substations by spending Rs.431.15crores in the next 02 to 03 years.
- Dakshin Haryana Bijli Vitran Nigam (DHBVN) has decided to set up 5,000 **distribution transformers** within six months from January 2013 to ensure uninterrupted power supply to its consumers. The transformers will be installed under a programme for maintenance and renovation of power distribution system. DHBVN expects to spend about Rs 5 billion under the programme by June 2013. Besides DHBVN, Uttar Haryana Bijli Vitran also plans to install new transformers in the state. The two DISCOMS identified 4,200 villages for the same. Around 800 transformers will be installed in urban areas, including 100 in Gurgaon.
- In February 2013, it was announced that Haryana Power Distribution Corporations would be spending Rs 500 crore in installing over 11,000 new **distribution transformers** and **erect 80,000 poles** in all the districts, including Gurgaon. Special maintenance programme for strengthening the system covers the works like tightening the loose conductor, replacement of all iron poles, erection of additional poles and conductor as per requirement, replacement of old and torn out conductor, maintenance and augmentation of transformers
- In November 2012 it was announced that in order to cut the huge **power theft and improve revenue realization** Haryana power utilities have decided to allot four electricity feeders in each operation circle to private parties called as 'Feeder Distribution Associates' (FDAs) on franchise model. Haryana has 20 power operation circles across the state. This step assumes significance in the wake of power utilities facing heavy amount of power theft that has affected their revenue realization. As per estimates, the power utilities are facing power theft to the tune of Rs 4-5 crore per day and 30 per cent of aggregate technical and commercial (AT&C) losses
- DHBVN launched a **call centre** in Gurgaon on October 2012 in order to enhance its efficiency in promptly redressing complaints of its consumers in Gurgaon and the entire DHBVN.

Generation:

- There will be an investment in the generation capacity by Haryana Power Generation Corporation Limited to set up a **gas powered power station (2x750MW) at Faridabad** and a super critical based thermal power generation unit (1x660MW) at **Yamunagar**; both projects are expected to be commissioned in the 12th plan, which will cater the growing demand for power in Haryana. There is also a proposal to setup a nuclear power plant (4x700MW) by NPCIL, in which the first phase (2X700MW) of work is expected to start in 2017-18.

Chapter2: Status and Implementation of Solar in Gurgaon

Gurgaon's Renewable energy

- The state government had set itself a target to achieve a minimum of 500 MW power generation through renewable energy projects by 2012. However, the actual figures achieved by the end of the previous year were just over 164 MW.
- Specifically for government agencies, schools and other public facilities, the centre was giving 30% financial assistance on solar power and the state is offering an additional 40%, making in effect these solar projects comparatively cheaper by 70%
- The state is generating around 7.8 MW of solar electricity at the moment, and another 6.5 MW have been commissioned under various projects, carried out in partnership with private firms.

Gurgaon as a Solar City

- The “Solar Cities” programme was launched by MNRE when in order to promote renewable energy usage in cities. Under this programme 48 cities got approval in principal; sanctions have been given to 31 cities for developing solar projects in their areas. Gurgaon and Faridabad also covered under this programme, Rs.47.45 lakhs and Rs. 48.75lakhs respectively was allocated for these two cities.

Sr. No.	Activities	Amount sanctioned (Rs. in lacs)
		Gurgaon
1.	Preparation of Master Plan	7.45
2.	Oversight of implementation during five years	Upto 10.00
3.	Setting up of solar cell & its functioning for a period of five years	Upto 10.00
4.	Other promotional activities during five years	Upto 20.00
	Total	Upto 47.45

- MC of Gurgaon released its work order to M/s ICLEI, NOIDA regarding preparation of Solar city Master Plan for Gurgaon at a cost of Rs. 7.45lakhs and Gurgaon city's Action Plan is also under preparation. MC's have constituted the stakeholder committee and solar city Cells and proposal for releasing the funds for Gurgaon City has been submitted with MNRE/GOI.

Progress of Solar Power Generation in Haryana as on 15.08.2012		
Year	Grid Connected Solar PV (MW)	Off Grid Solar Power PV (MW)
2009-10	0	0.2
2010-11	0	0.09
2011-12	7.8	0.28

Solar Projects Implemented in Gurgaon as on 15.08.12		
Type of Projects	Commissioned MW (No. of Projects)	Under Execution MW (No. of Projects)
Grid Connected Solar PV	3 (3)	1 (1)
Off Grid Solar Power	0.2502 (2)	0.287(7)

Total Solar Power Projects Implemented in Haryana as on 15.08.12		
Type of Projects	Commissioned MW (No. of Projects)	Under Execution MW (No. of Projects)
Grid Connected Solar PV	7.8 (8)	6.50 (1)
Off Grid Solar Power	0.57 (30)	0.434 (19)

- Utilization of Solar energy can be one of solutions to tackle the power deficit problem in Gurgaon, but so far there are not much solar energy installations in Gurgaon. Even solar power development in entire Haryana itself is in a very nascent stage.
- As on 2012 the total installed solar power capacity in Gurgaon is around 3.28MW in which 3MW is grid connected and 0.28MW is off- grid. In Gurgaon the installation of solar power started in the 2009-10 and the growth of solar power in Gurgaon circle is also very negligible may be due to policy negligence or due to cost of solar power installations or there is less awareness regarding solar power.

Solar Projects - Utility Scale/Grid Connected & Roof top/Off Grid:

- Land cost in Gurgaon is the major deterrent for these projects to come up, so far only 3MW of grid connected solar power is installed around Gurgaon. The commercial attractiveness of these projects are coming down day by day due to substantial rise in land cost and expansion of Gurgaon's urban area landscape.
- Gurgaon's potential for solar roof top projects needs proper assessment, till now the exact potential and growth rate of this potential in Gurgaon is unknown. As per the rough assessment made by the solar industry people; presently Gurgaon's potential for roof top solar installations will be 200MW, which will be useful in captive power consumption.
- Despite good potential, the projects were not taken up due to unclear government policy, lack of awareness and support from consumers.

SWH & Small Scale Applications of Solar in Gurgaon:

In 2009, Gurgaon's total demand for Solar Water Heating (SWH) systems is 31.5mn lpd but only 0.266mn lpd was met, which is an evidence for very low penetration level of SWH in Gurgaon. In 2010 the demand is 35mn lpd, 2014 the demand is expected to reach 45mn lpd. 70% of the demand for SWH is from residential segment.

The potential for solar powered street lights is around 12000, till date only 500 solar powered street lights are installed. Implementation and penetration of domestic solar systems like solar lanterns, LED home lighting system, box & dish type solar cookers are in the same state as solar street lighting systems.

Reason for this poor situation is lack of awareness among people on solar power and its usage; even a graduate is unaware of the solar appliances/applications present in market, schemes and the subsidies he/she can avail if he/she implements solar powered appliance. improve the penetration of solar power in households.

Conclusion:

- Although utility scale solar projects have a very low or nil potential in the Gurgaon, solar rooftop projects have good potential followed by the small scale applications. But this potential can't be tapped fully without providing stimulus. Some of the steps that are needed to be taken for the off take of such projects are :

- **Net metering scheme for grid connected rooftop projects:** This will enable the captive power consumers to feed excess energy (if any) into the grid. This will help distribution utilities in reducing their demand-supply deficit and benefit customers through reduction in energy bills.
- **State govt. policy:** Central Govt. has provided the needed policies and funds to reduce the initial capital investment, state government also need to develop a clean energy fund through which it can further subsidize or incentivize solar projects for faster implementation.
- **Solar Purchase Obligations - Demand Side:** State govt can enforce Solar power obligations on commercial and industrial energy consumers. The SPO should state a specific percentage of their total energy needs to be procured from a renewable resource.
- There is a legislation that mandates buildings that have plot size of 500 sq yards and above to adopt solar water heating systems. Such sized plots constitute less than 10% of the total residential plots. In order to have a significant impact mandatory provision should apply to all plot sizes of 200 sq yards and above.
- Solar PC as well as LEDs can be used for traffic lights, street lights, blinkers on roads and parking lights. Schools and Hospitals should be encouraged to have solar roof top panels.
- Solar power should be made compulsory for malls, housing societies, and commercial establishments. Malls are power guzzlers. Especially with the large amount of glass in their building structures, they trap a lot of heat. Through legislation, it should be mandatory for malls to have some solar structures to take care of atleast some part of their power requirement.
- Regular visits of RWAs should be arranged to Solar Energy Centre (Guwal Pahari) as well as Rajiv Gandhi Renewable Centre (at Leisure Valley) to improve awareness levels about use of solar and the fact that price of solar PV is reducing.
- These initiatives will encourage usage of solar power realize its full potential in a mutually beneficial format for both the distribution utility and the consumer; providing a green and clean environment which is much needed, especially in cities like Gurgaon.

Chapter 3: Way Forward

Way Forward

- In order to stand up to the expectations of a millennium city, Gurgaon has to improve the electricity standards by providing quality and reliable supply at affordable price. At the national level, full throttle distribution privatization in areas such as Delhi has not been a preferred option. Distribution franchisee, (where the ownership rests with the state and the private player has only operational control and share in efficiency gains), a softer option is prevalent in many cities including Bhiwandi, Nagpur and Agra. Gurgaon could have gone for such a mode of privatization; however lack of political willingness has been the greatest stumbling block. The recent initiatives taken by DHBVN in enhancing electricity situation in Gurgaon are very encouraging. To move forward, some of the options that DHBVN shall consider are:
- **Control theft and other losses:** Gurgaon circle is having 16% gap between total units received and total units billed. This might be due to higher distribution losses or due to theft which can be reduced by improving HT: LT mix, by improving metering, strengthening infrastructure and by reducing billing errors. AT&C losses for Gurgaon circle as a whole looks very impressive at 11.58% but some of the divisions within the circle are facing AT&C losses as high as 83 percent. To reduce this, DHBVN can think about franchising some of the divisions or some of the division's operations to private players.
- **Adopting Right Technologies and best practices:** DHBVN shall deploy technologies like Distribution management systems in "Gurgaon-City division" and "Gurgaon-Sub urban division" which are having AT&C losses of 8.03 percent and 4.08 percent respectively to improve the quality and reliability of the power supply. Besides, Gurgaon's peak deficit is as high as 30 percent during summer seasons. Initiatives like Demand side management (DSM) will help in reducing the peak demand, enhancing the quality of the power supply and improves consumer satisfaction. Some of the initiatives like SMS based fault management system, Outage management systems, Unmanned grid substations & Geographic information systems(GIS),Automatic meter reading (AMR) for high revenue consumers shall be implemented in Gurgaon-City division and Gurgaon-Sub urban division in order to improve reliability and customer satisfaction. Implementation of High voltage distribution systems (HVDS) and LT ABC (Aerial bunched conductor) will help in theft reduction. Lastly, Gurgaon should also be adopted under the centre's smart grid programme.

- **Get Captive Capacity in to the Grid:** Gurgaon circle has captive generation capacity of 2000MW which is twice the peak demand of the circle. Captive power generators in factories and apartment complexes can be tapped to supply during peak demand. In order to facilitate this new policy framework need to be crafted and Distribution infrastructure need to be strengthened.
- **Improve Billing Efficiency:** In order to enhance the customer satisfaction DHBVN should reduce billing errors and enhance its efficiency in promptly addressing the complaints.
- **Improving General Organizational Management:** DHBVN has to be a better run and organized company. It has to change its old working methods and practices and improve employee productivity and motivational levels for better operational performance.
- **Improve Metering:** DT level metering is very low at 8.67 percent, it has to be improved to 100 percent, and this will help in effective Energy auditing
- **Spruce up generation resources:** DHBVN should source more power for Gurgaon. However, delays in implementation of projects due to poor environmental clearances and lack of coal have led to delays. Some of the power plants are more than a decade and in need of immediate retrofitting and revamping in order to cope up with the rising power demand.
- **Real Estate Developers fail to implement their part of infrastructure:** In December 2010, DHBVN introduced a policy to speed up the process of developing & upgrading distribution infrastructure in areas developed by realtors. As per this policy the incurred cost for the development will be shared on 75:25 ratios between realtors and DHBVN. As per DHBVN, most of the realtors who had agreed for and got connections under this scheme still haven't developed the required infrastructure in terms of feeders and substations their areas till now. They need to be handled more strictly. In new colonies, many developers have not put up even basic infrastructure.

Chapter4: Key Parameters & Comparative Analysis vis-à-vis other circles

Key Parameters

- A snapshot of some of the notable parameters is given below which will be helpful in getting the panoramic view of Gurgaon Distribution circle.
- Following table compares Gurgaon circle's performance with other distribution entities in terms of operational efficiency, load density and other parameters.

Performance Indicator	Unit	Gurgaon circle	NDPL	Reliance Infra	Torrent
Sales per square kilometer of the distributed area	MU/Sq.km	3.6	11.37	21.67	3.4
Load density- Sales/Connections/Year	Units	10003.3	4833	3053	12623
Customer Density- No. of customers per square kilometer of an area	000'Connections/sq.km	0.4	2.35	7.1	0.27
Employee productivity	000'connections/No of employees	0.8	3.5	1.56	4.37
HT:LT Mix	%	0.77	0.74	1.08	0.52

Contact details: DHBVN

Designation	Name of the person	Office Address
Chairman & Managing Director	Mr.DevenderSingh, I.A.S.	VidyutNagar ,Hisar:125005 Haryana ,India Ph. No. 01662-223734 Email id:mddhbvn10@gmail.com
Director-Operations	Mr.VijayKumar Chaudhary	VidyutNagar Hisar:125005 Haryana ,India Ph.No:01662-223110,Mobile:9812206666,Fax223334 Email id:diropsdhbvn@gmail.com
Chief General Manager	Mr.S.S.Gupta	011-28313780 Fax-28312866 09540954817 Email id:cedelhi@gmail.com
General Manager	Mr. Sanjeev Chopra	DHBVN, Mehurali Road, Gurgaon Ph.No-0124-2322427 Fax- 2306590 Mobile:09540954930 email id:se.gurgaon@gmail.com
DGM	Mr. J. S. Hooda	OP City GGN DHBVN, Mehurali Road, Gurgaon (0124 - 320971) Email id:xencitydhbvn@gmail.com
DGM	Mr. K.C Agarwal	'OP Sub-Urban GGN', DHBVN, Huda Complex Sec-31, Gurgaon (0124-2384755) xensuburbandhbvn@gmail.com
DGM	Mr. BK Ranjan	'OP Manesar', DHBVN, IDC Sec-14, Near Hero Honda Workshop, Gurgaon (0124-2225392) Email id:xenmanesar@gmail.com
DGM	Mr. T.C.Kansal	'OP Sohna', DHBVN, Sohna (0124-2362344) Email id:xensohna@gmail.com
DGM	Mr. D.L. Hansu	'OP Nuh', DHBVN, Reat House Road, Mewat (01267-274530) Email id:xennuh@gmail.com

