



24X7 POWER FOR ALL

A JOINT INITIATIVE OF GOVERNMENT OF
INDIA AND GOVERNMENT OF HARYANA



DECEMBER 2015



Government of India



Piyush Goyal

Minister of State (Independent Charge) for Power, Coal and New & Renewable Energy

Foreword

Electricity consumption is one of the most important indices that decides the development level of a nation. The Government of India is committed to improving the quality of life of its citizens through higher electricity consumption. Our aim is to provide each household access to electricity, round the clock. The 'Power for All' programme is a major step in this direction.

Haryana is one of the high per capita electricity consumption states in the country and is one of the states that has already achieved 100% village electrification. However, it has to make a time bound program to supply 24x7 power in the rural areas as well.

This joint initiative of Government of India and Government of Haryana aims to further enhance the satisfaction levels of the consumers and improve the quality of life of people through 24x7 power supply. This would lead to rapid economic development of the state in primary, secondary & tertiary sectors resulting in inclusive development.

I compliment the Government of Haryana and wish them all the best for implementation of this programme. The Government of India will complement the efforts of Government of Haryana in bringing uninterrupted quality power to each household, industries, commercial business, public needs, small & medium enterprises & any other public needs and adequate power to agriculture as per the state policy.



Government of Haryana



Manohar Lal

Chief Minister of Haryana

Foreword

Power sector is a critical infrastructure element required for the smooth functioning of the economy. An efficient, resilient and financially sustainable power sector is essential to stimulate growth and prosperity in the state. The availability of reliable, quality and affordable power can ensure growth of all sectors of economy including agricultural, industrial and others.

Haryana is a prosperous state with 100% electrification. However, there is need for strengthening the system and enhance the average hours of power supply to consumers coupled with the need to control the cost of power and keep the power companies also in pink of financial health. AT & C loss reduction and application of energy efficiency measures would go a long way in achieving these objectives.

It is at this juncture that “**24x7 Power for all**” programme play a pivotal role. Conceived with the objective of providing 24x7 quality, reliable and affordable power for all, this programme takes a holistic approach for addressing the concerns across the value chain in Power sector.

On behalf of Government of Haryana, I would like to thank Government of India, Hon’ble Prime Minister and Hon’ble Minister of Power for implementation of this programme.



सत्यमेव जयते

Government of India

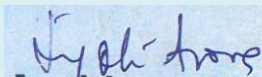


Government of Haryana

Joint Statement

The State of Haryana is committed to provide quality life to people of state. Electricity supply serves as an important means to achieve this. The programme of "24x7 power for all" is an important step in this direction and this programme will be implemented by Government of Haryana (GoH) with the objective to connect the unconnected in phased manner by FY 2018-19 to ensure supply of quality, reliable and affordable power to all category of consumers on 24x7x365 basis.

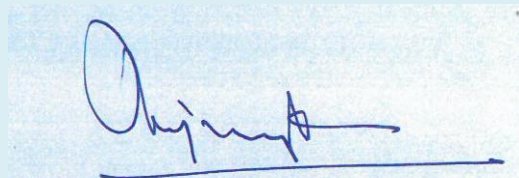
Government of Haryana would ensure that all the necessary steps outlined in the PFA document are taken up in terms of capacity addition, power procurement, strengthening the required transmission and distribution network, encouraging renewable, demand side management & energy efficiency measures, undertaking customer centric initiatives, reduction of AT & C losses, bridging the gap between ACS & ARR, and following good governance practices in implementation of all central and state government schemes.


Jyoti Arora, IAS
Joint Secretary
Minister of Power (GoI)

Government of India (GoI) would supplement the efforts of Government of Haryana by fast tracking resolution of key issues pertaining to generation, expediting the additional interstate connectivity and ensuring optimum allocations in various distribution schemes, as per the provisions of applicable policies.

Government of Haryana would endeavour to implement the programme within the targeted time frame of FY 2018-19 or even earlier than the targeted date.

The central and state governments would meet regularly to review the progress of the programme over the next four (4) years and would strive to achieve the objectives of the programme by taking the necessary steps as envisaged in the PFA document.


Rajan Kumar Gupta, IAS
Addl. Chief Secretary
(Power & Renewable Energy)
Government of Haryana(GoH)

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EXECUTIVE SUMMARY

24x7 Power for All (24x7 PFA) is a Joint Initiative of Government of India (GoI) and State Governments with the objective to make 24x7 power available to all households, industry, commercial businesses, public needs & any other electricity consuming entity and adequate power to agriculture consumers by FY 2018-19 as per the State policy.

This roadmap document aims to meet the above objectives for the state of Haryana. Haryana stands at 10th position with approximately 3.53% of total installed capacity in the country. Haryana has achieved 100% electrification during the year 1971-72 and the per capita consumption of power in Haryana has been 1909 Units which is much higher than the National Average of 1010 during FY 2014-15.

GROWTH IN DEMAND

Haryana has shown no peak power shortage and less than 1% energy shortage during last two years. In order to achieve the objective of 24 x 7 power supply to all, the state would see an increase in peak demand from 9,152 MW at present (FY 2014-15) to 12112 MW in FY 2018-19 with corresponding increase in energy requirement from 46,615 MU in FY 2014-15 to 66,821MU in FY 2018-19.

The future demand has been derived by estimating the urban and rural household consumption taking into account the growth in number of electrified households on the one hand and the growth in average consumption per household on the other. Considering combined growth rate based on five (5) years CAGR (from 2008-09 to 2012-13) and the future growth potential of industrial & commercial activity, average CAGR of 10% per annum has been adopted to project the consumption other than domestic category consumers.

SUPPLY ADEQUACY

The present availability of power in the state from various sources is 11124.54 MW. In order to meet the increasing demand, the state has already planned additional capacity availability

of 1484.56 MW through own generating stations, renewable energy sources, central generating stations and long Term/ medium term PPAs through competitive bidding in a phased manner by FY 2018-19.

Even with the availability of additional capacity, the state will still be facing a shortfall of 2.03% (during FY 2015-16) in terms of peak demand, which is likely to increase to 17.71% during FY 2018-19. However, during the same period the state shall have surplus availability of energy ranging from 35.92% to 12.39%.

It is worth mentioning that Haryana State has a typical demand variation between paddy season (from June to September) and rest of the year. During paddy season the demand touches its maximum but reduces to less than half during rest of the time.

In order to mitigate the situation, the state will have to progressively plan to tie up additional power on short/medium/Long term basis. Considering the uniqueness of the situation, the state will have to plan procurement of power in a measured way so that peak demand is met while surplus in energy availability is minimised i.e. with right kind of generation mix, by giving more preference to the RES & Hydro projects. Government of Haryana may also arrange additional power during paddy seasons through banking of power with other states having different seasonal load pattern. At the same time, the deficit in peak demand can be effectively reduced through proper implementation of DSM & Energy efficiency measures in the state. In addition, the state is required to firm up plan for selling surplus energy and earn revenue during the periods when surplus energy is available.

The state has planned coal based projects of capacity 1600 MW in the state which includes 800 MW each at Panipat by PTPS and at Yamuna Nagar by DCRTTP which are very important and to be executed expeditiously for meeting the expected power demand of the state beyond FY 2018-19.



ADEQUACY OF TRANSMISSION NETWORK

The state is well served by a network of Inter-state transmission lines at 400kV, 220kV levels. The existing ISTS transmission system capacity is adequate for meeting the present power requirement.

In ISTS system, Power-grid has undertaken/planned a number of transmission works for further strengthening the connectivity of Haryana state grid with national grid and it shall be adequate to meet the projected power demand of Haryana by FY 2018-19 for 24x7 PFA in the state.

The existing Intra-state transmission capacity at 220 kV level is 16790 MVA to cater the current maximum demand 9152 MW of the state. As per the state's transmission plan, the Intra-state transmission capacity will be increased to 29000 MVA at 220 kV level by FY 2018-19 which will be adequate to meet the projected Power demand of 12112 MW of the state by FY 2018-19 to cater 24x7 PFA requirements.

The Intra-state transmission system has been planned with an investment of Rs 4,620.16 Crores from FY 2014-15 to FY 2018-19 towards capacity addition in the state to meet the requirement as envisaged for 24x7 PFA.

ADEQUACY OF DISTRIBUTION NETWORK

As per the information, Haryana Discoms are serving about 53.81 Lakhs consumers including 41.36 lakhs domestic consumers in the state. As per the survey undertaken by the state, still there are about 2.85 lakhs rural un-electrified households in the state which are proposed to be electrified during next four (4) financial years.

A scheme for Smart City at Gurgaon has been proposed to go for 33 kV distribution system instead of upgradation of existing 11 kV system to resolve ROW problem & to cater the future load growth. The work shall be carried out in phased manner giving priority to highest revenue earning areas with an approximate

expenditure of Rs. 1200 Cr. The work shall include 33 kV underground cabling, replacement of all 11/0.4 kV distribution transformers with 33/0.4 kV distribution transformers, SCADA & OMS, AMI & provision of RMUs & RTUs, etc. for ensuring 24x7 power supply.

Both UHBVN and DHBVN has proposed a capex plan of Rs 4,664.58 Crores and Rs 4089.11 Crores respectively during FY 2015-16 to FY 2018-19 towards capacity addition in the state to meet the requirement as envisaged for 24x7 PFA.

The state has proposed a requirement of capital expenditure of Rs 1883.87 Crores in DDUGJY and Rs. 1113.73 Crores in IPDS for feeder segregation, providing electricity access to all rural households, system strengthening & network up -gradation in rural & urban areas through a planned capacity addition of 7496 MVA at 132/11 kV, 66/11kV & 33/11 kV, 6632 MVA at DT level and creation of 33 kV, 11kV ABC & Bare conductor lines, U/G cables, LT lines, Electronic consumer meters, Capacitor bank etc.

The proposed distribution network with projected addition through GOI/State schemes (RAPDRP-B, JICA, IBRD, DDUGJY, IPDS, RGGVY and MGGBY) would be adequate under projected peak load addition.

The AT & C losses of the state are projected to be reduced from 22.2 % to 17.1% by FY 2018-19 as per state data.

FINANCIAL POSITION

The accumulated losses of both the discoms of Haryana have increased from Rs. 23357 Crores during FY 2012-13 to Rs 24621 Crores during FY 2013-14.

The heavy financial losses and cash deficit currently faced by the distribution utilities of Haryana are attributable to the compounded effect of several issues like non-revision of tariff between 2001 -2010, increased cost of short-term power purchase & unscheduled interchange, delayed as well as under-recovery



of FSA, increase in employee cost, inadequate RE subsidy and outstanding receivables from sundry debtors (amount ranging between Rs 4000 Crores and Rs 5000 Crores).

However, various measures have to be taken by

Government of Haryana to bring down the losses of discoms which may include optimization of power purchase cost, measures to reduce AT&C losses including reduction of theft and achieving 100% metering, billing & collections efficiency etc.



Access to electricity on 24x7 basis for all its citizens has become synonymous to cause of social equality. It means much more than merely an act of infrastructure development to any nation and thus this issue has acquired significant dominance on the national as well as state agenda. Endeavour to perk-up the growth in electricity consumption to stay in pace with national/global benchmark therefore are to be taken up with top most priority.

Under the Indian Constitution, electricity is a concurrent subject and distribution of electricity falls under the purview of the respective State Government/State Power Utility. As per Electricity Act 2003, it is the duty of a distribution licensee to develop and maintain an efficient, co-ordinated and economical distribution system in his area of supply and to supply electricity in accordance with the provisions contained in the Act. The State Electricity Regulatory Commission (SERC) shall specify or enforce standards with respect to quality, continuity and reliability of service by licensees. Accordingly, State Electricity Regulatory Commissions (SERCs) have notified the Standards of Performance specifying maximum allowable time for restoration of supply due to forced breakdowns and Supply Code specifying the supply voltages & frequency etc, to be followed by Discoms. SERCs also monitor the performance of distribution companies on the basis of notified Performance of Standards.

OBJECTIVES OF THE 24X7 POWER FOR ALL – JOINT INITIATIVE

To supplement the efforts towards achieving this objective, Government of India and Government of Haryana have taken a joint initiative to provide 24 X 7 power in the state to all consumers. The hours of adequate supply to agriculture consumers will be decided by the state Government. This initiative aims at ensuring uninterrupted supply of quality power to existing consumers and providing access to electricity to all unconnected consumers by FY 2018-19.

The initiative of 24x7 Power supply to all encompasses mainly the following:

- i. Reliable & quality 24X7 power supply to the existing consumers in a phased manner within a period of three years from the date of commencement of the programme.
- ii. All unconnected households to be provided access to electricity in a time bound manner ultimately by FY 2018-19. States have the liberty to hasten the process by taking accelerated steps, if required.
- iii. To ensure adequate capacity addition planning & tie ups for power from various sources at affordable price to meet the projected increase in power demand for future.
- iv. Strengthen the Transmission and Distribution network to cater to the expected growth in demand of existing as well as forthcoming consumers.
- v. Monitoring the timely commissioning of various generating plants, transmission and distribution infrastructure to meet the expected growth in demand.
- vi. Put in place a strategy to ensure reduction of AT&C losses as per the agreed loss reduction trajectory and methodology & steps required to be taken at every level of distribution in this regard.
- vii. Overall Power Supply Improvement to be achieved by undertaking measures such as energy mix optimization, reduction in power operational in efficiency of state generation plant(s) and optimal fuel procurement policy.
- viii. Financial measures including investment rollout plans and undertaking necessary balance sheet analysis to assess the financial strength/ weaknesses in the utility finances.
- ix. Introduce modern technologies to monitor reliable supply like sub-station automation, providing adequate communication infrastructure, GIS, Reliability, Centralised Network Analysis and Planning tools, SAP driven ERP systems, DMS (Distribution Management Systems), OMS (Outage Management System), etc.



- x. To take essential measures for meeting the performance standards as laid down by SERC.

An Action plan would be drawn to achieve the above aims and objectives. The plan will be executed by the State Government with the support of Government of India, wherever necessary, as per their approved plans, schemes and policies. This joint initiative of Government of India and Government of Haryana aims to enhance the satisfaction levels of consumers, improve the quality of life of people, and increase the economic activities resulting into inclusive development of the state.

METHODOLOGY FOR PREPARATION OF THE ACTION PLAN FOR THE 24X7 POWER FOR ALL

Accordingly the methodology adopted to prepare the 'Action Plan' for 24x7 PFA includes inter-alia:

- 1) Projection of average per day consumption of rural and urban households based on respective historical compounded annual growth rates (CAGR) during the past years and considering the aspirational growth perspectives.
- 2) Projection of demand of consumers encompassing commercial, industrial, agricultural and all remaining consumers have been carried out under others category based on past data and historical CAGR recorded for the state during the past years after discussing with state and factoring in the aspirational growth perspectives.
- 3) Assess the power requirement of un-electrified households and draw up a time bound plan for electrification of all households.
- 4) Project the annual energy requirement and maximum demand by aggregating the requirement of all consumer categories and applying an appropriate load factor.
- 5) Prepare a broad plan to meet power demand in future through additional generation capacity proposed in the state and quantum for additional procurement required.
- 6) Assess the financial implications on utilities and per unit implication on tariff for procuring additional energy to meet the energy requirement of all segments of consumers. Assess the adequacy of the network - both inter-state and intra-state transmission as well as distribution so as to meet the increased / expected / projected power requirement of all consumer categories of the state.
- 7) Conduct sensitivity analysis on various parameters namely average purchase price of energy, AT&C loss reduction, etc.
- 8) Set monitorable targets to achieve the goal of 24x7 PFA in a cost effective manner to the consumers of the state.



CHAPTER – 2: FACTS ABOUT HARYANA



Haryana is the 20th largest state with an area of 44,212 km² and the 17th largest by population (as per census 2011) with total population of 25,351,462 (13,494,734 male and 11,856,728 female). Haryana boasts to have highest number of affluent rural population. It is one of the wealthier states of India and had the second highest per capita income in the country in FY 2013-14. It is bordered by Punjab and Himachal Pradesh to its north and by Rajasthan to the west and south. It also borders country's capital Delhi on three sides, North, West & South. The sacred Yamuna River flows along its eastern boundary. Haryana has forest area of 1,553 km², which is about 3.5% of its geographical area.

The brief profile of Haryana State of India is as follows:

Table-2.1

Brief Profile of Haryana

Sl. No.	Description	Unit	
1.	Area	Sq. Km.	44212
2.	Population (Persons as per 2011 census)		
	- Rural	Nos.	16,510,978
	- Urban	Nos.	8,842,103
3.	Per Capita income	Rs.	133427*
4.	No. of Districts	Nos.	21
5.	State GDP growth rate (FY 2013-14)	%	13.80**
6	Total Urban Households (FY 2014-15)	Nos.	2129713
7	Total Rural Households (FY 2014-15)	Nos.	3199395
8	Total Electrified Urban Households	Nos.	2129713

Sl. No.	Description	Unit	
	(FY 2014-15)		
9	Total Electrified Rural Households (FY 2014-15)	Nos.	2914194
10	No. of un-electrified Households (FY 2014-15)	Nos.	285201

*Economic Survey of Haryana FY 2014-15

**Wikipedia

Haryana power establishments have been a forerunner in terms of growth in comparison to national capacity creation. On the one hand, state boasts to have surplus electricity which is distributed by two state-owned power utilities i.e. Uttar Haryana Bijli Vitran Nigam (UHBVN) and Dakshin Haryana Bijli Vitran Nigam (DHBVN). On the other hand, it suffers from inability to sell power at compensatory rates in the market. Haryana stands at 10th position with approximately 3.53% of total installed capacity in the country.

Haryana has shown 0% peak shortage and less than 1% energy shortage during last two (2) years and have achieved 100% electrification but there are still 2.85 lakhs rural un-electrified households in the state which are proposed to be electrified by FY 2018-19 in phased manner.



CHAPTER – 3: CONSUMPTION PATTERN AND ELECTRIFICATION STATUS

As per Census 2011 data, there were about 47.2 lakhs households in the state, out of which 29.7 lakhs were in rural areas and balance 17.5 lakhs were in urban areas. Out of 29.7 lakhs rural households, 25.9 lakhs (87.2%) were electrified and balance 3.8 lakhs (12.8 %) were un-electrified. In urban areas, out of total of 47.2 lakhs households, 42.7 lakhs (90.5 %) were electrified and balance 4.5 lakhs (9.5 %) were un-electrified. Haryana registers a strong foothold in terms of electrification with

around 90.5% households as electrified. The details are at Annexure-II.

The projection of total number of households in FY 2014-15 has been carried out based on census figures of 2011 and considering CAGR of the past 10 years. However, the data for total number of electrified households in urban and rural areas in FY 2014-15 is also compared with state data and the latest data of the state has been considered for projecting the future household consumption.

The details of households in the State of Haryana based on Census figures and as per GoH are as under:

Table-3.1

Nos. of Households in Haryana in FY 2014-15

Particulars	Census 2001	Census 2011	CAGR	As projected from Census figures	As per GoH	Finally Adopted
Total Households	3529642	4717954	2.94%	5329108	As per Census	5329108
Rural Households	2454463	2966053	1.91%	3199395		3199395
Urban Households	1075179	1751901	5.00%	2129713		2129713
Total Electrified Households	2926073	4271727	3.86%	4969707	5043907	5043907
Rural Electrified H/H	1926753	2586398	2.99%	2909666	2914194	2914194
Urban Electrified H/H	998841	1685329	5.37%	2077591	2129713	2129713
Total Un-electrified H/H	603569	446227	-2.98%	395827	285201	285201
Rural Un-electrified H/H	527710	379655	-3.24%	332803	285201	285201
Urban Un-electrified H/H	76338	66572	-1.36%	63025	0	0

Presently, there are about 50.44 lakhs electrified households in the state (Rural 29.14 lakhs and Urban 21.29 lakhs). Thus there are total of around 2.85 lakhs un-electrified households in rural area whereas the state has achieved 100% urban electrification. At present, out of the total consumption in the state, domestic category of consumers consumes about 22%, industrial 31% and agricultural around 28%. The category

wise Growth in consumers from FY 2009-10 to FY 2013-14 is furnished in Annexure-I.

Load Projection

Based on the urban & rural consumption data provided by GoH, present per household consumption has been assessed as 2.24 units/day in rural area and 6.14 units/day in urban area as shown in Table 3.2.



Table-3.2**ESTIMATION OF EXISTING PER HOUSEHOLD CONSUMPTION FOR FY 2014-15**

Sl. No.	Particulars	Unit	As per State data (FY 2014-2015)
1	Total Households in State	Nos.	5329108
2	Total Urban Households	Nos.	2129713
3	Total Rural Households	Nos.	3199395
4	Total Electrified Households	Nos.	5043907
5	Total Electrified Households - Urban	Nos.	2129713
6	Total Electrified Households - Rural	Nos.	2914194
7	Balance Un-electrified Households	Nos.	285201
8	Balance Un-electrified Households - Urban	Nos.	0
9	Balance Un-electrified Households - Rural	Nos.	285201
10	Electrification of houses under 12th Plan RGGVY	Nos.	0
11	Annual energy sold in the State during FY 2014-15	MU	32878
12	Annual Domestic energy sold in the state during FY 2014-15	%	21.79
13	Annual Domestic energy sold in the State during FY 2014-15	MU	7164
14	Average Annual Energy Consumption per household during FY 2014-15	kWh	1420
15	Average Daily Energy Consumption per household during FY2014-15	kWh	3.89
16	Annual Total Rural Consumption	MU	2388
17	Annual per household rural consumption	kWh	819
18	Annual Total Urban Consumption	MU	4776
19	Annual per Household Urban Consumption	kWh	2243
20	Daily per household rural consumption	kWh	2.24
21	Daily per household Urban consumption	kWh	6.14

The daily per household Rural and Urban consumption as worked out above has been considered for projection of Annual energy requirement in the state from FY 2015-16 to FY 2018-19

CHAPTER – 4: DEMAND AND SUPPLY SCENARIO

Since long, Haryana has been a leader in taking initiatives in its power sector achieving 0% peaking shortage in FY 2013-14 & FY 2014-15.

During FY 2014-15, Haryana has experienced 0.39 % shortage in energy. The Power Supply Scenario in Haryana (as per state data) from the FY 2009-10 to FY 2014-15 is as under-

Table-4.1

Power Supply Scenario

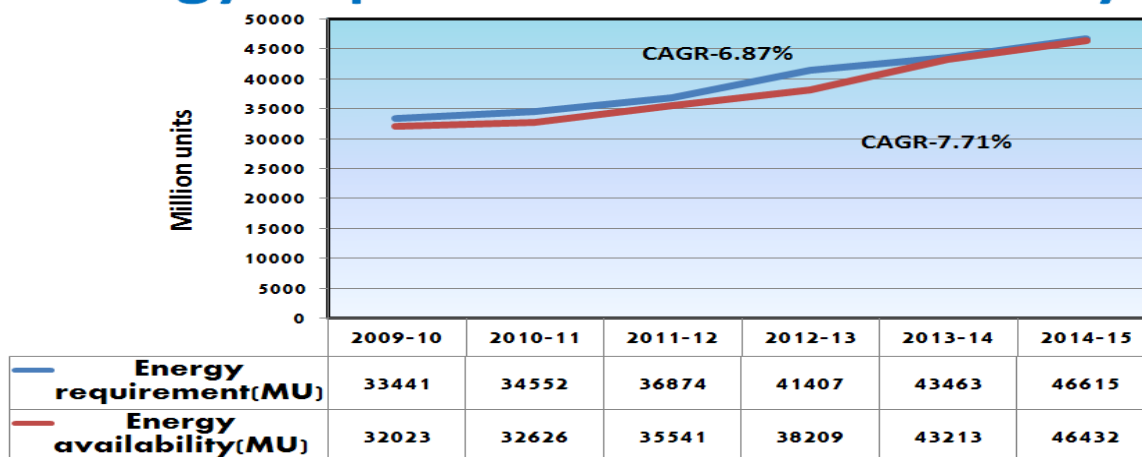
Period/Items	Unit	FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15
Peak Demand at state periphery	MW	6133	6142	6767	8086	8114	9152
Peak Met at state periphery	MW	5678	5554	6443	6725	8114	9152
Peak Deficit (-)/ Surplus (+)	MW	(-)455	(-)588	(-)324	(-)1361	0	0
Peak Deficit (-)/ Surplus (+)	%	(-) 7.42	(-) 9.57	(-) 4.79	(-)16.83	0.00	0.00
Energy Requirement at state periphery	MU	33441	34552	36874	41407	43463	46615
Energy Availability at state periphery	MU	32023	32626	35541	38209	43213	46432
Energy Deficit (-)/ Surplus (+)	MU	(-)1418	(-)1926	(-)1333	(-)3198	(-)250	(-)183
Energy Deficit (-)/ Surplus (+)	%	(-)4.24	(-)5.57	(-)3.62	(-)7.72	(-) 0.58	(-) 0.39

Source: State Power Utilities/CEA

The reduction in shortages in energy during last 2 years is mainly on account of the fact that percentage increase in availability of energy for the state is more than the increase in energy requirement, which has led to better scenario in the state during FY 2014-15.

The energy requirement including all categories of consumers has posted a Compound Annual Growth Rate (CAGR) of 6.87% as against the supply growing at a CAGR of 7.71% based on data from year FY 2009-10 to FY 2014-15. The scenario is exhibited below:

Energy requirement and availability



The base year for the purpose of beginning the future assessment has been considered as FY 2014-15 which has an aggregated demand of 46.615 Billion Unit (BU).

Demand Estimation Methodology

For the purpose of estimation, power consumers have been broadly classified into the domestic consumers and others (commercial, industrial, agriculture etc.). The demand projection has been done taking into account the demand for 24X7 power supply under following heads:

- a) Demand growth to a targeted value of already electrified households (both Urban and Rural).
- b) Demand growth from electrification of un-electrified rural households.
- c) Demand from electrification of newly constructed households (both Urban and Rural).
- d) Demand on account of consumers other than domestic consumers including agricultural consumers.

Considering the expected rapid growth of electrification in the state in the coming years, all the un-electrified households have been considered to be brought under electrification at the rate of 25% per year for the consecutive four years from FY 2015-16 to FY 2018-19.

The assumptions for projection of demand under different categories are described below:

- Based on the urban & rural consumption data provided by GoH, present (FY 2014-15) per household consumption has been assessed as 2.24 units/day in rural area and 6.14 units/day in urban area.
- Energy requirement for rural & urban households have been computed based on the latent demand growth observed in past. The daily per household rural consumption is estimated to increase from the current levels of 2.24 units/day to 3.3 units/day by FY 2018-19 and daily per household urban consumption is estimated to increase from the current levels of 6.14 units/day to 9.0 units/day by FY 2018-19.



- Demand projections for consumers other than domestic have been done after discussions with State officials. 10% constant growth in energy requirement per annum has been taken keeping in view the rapid growth in industrial and commercial activities due to assured power availability.

PROJECTIONS OF ANNUAL ENERGY REQUIREMENT OF THE STATE

The annual energy requirement at state periphery works out to be around 51.90 BU in FY 2015-16 which is scaling up to around 66.82 BU in FY 2018-19 after considering the following.

a) Demand of already electrified households

The annual energy consumption for existing households works out to be 10.5 BU in FY 2018-19.

b) Demand from electrification of un-electrified households

According to the state data there are around 285201 un-electrified rural households which are assumed to be electrified at the rate of 25% per year from FY 2015-16 to FY 2018-19. The annual energy requirement on account of un-electrified households after electrification is estimated as 0.342 BU in FY 2018-19.

c) Demand from electrification of newly constructed households

To account for energy requirement of new houses which are likely to be constructed in the coming years, projection have been done considering CAGR of 5.00% (census of 2001 & 2011) on number of urban households and CAGR of 1.91% in number of rural households based on census data. The projected energy consumption of this category works out to 1.81 BU in FY 2018-19.

d) Demand on account of consumers other than domestic consumers.

The annual energy requirement for consumers other than domestic has been calculated after discussion with state officers assuming that such segment of consumers are expected to

grow at a constant CAGR of 10% per annum. The energy consumption of consumers other than domestic consumers works out to be 41.41 BU in FY 2018-19. The summary of energy calculation during the next four years is given in the table hereunder.

Table-4.2

SUMMARY OF ANNUAL ENERGY REQUIREMENT PROJECTIONS (in MU)					
Sl. No.	PARTICULARS→ ↓	YEARS			
		FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
1	Annual Energy Requirement including additional energy requirement for existing electrified households	7881	8669	9536	10489
2	Annual Energy Requirement for Electrification of un-electrified Household	64	141	233	342
3	Annual Energy Requirement for newly constructed Household	318	715	1207	1810
	TOTAL DOMESTIC	8263	9525	10976	12641
4	Total Annual Energy Requirement including additional energy requirement - Other than Domestic Consumers (with 10% growth per annum)	31114	34226	37648	41413
	GRAND TOTAL	39377	43751	48624	54054

Annual energy requirement at state periphery:

The table below shows values of projected energy requirement at the state periphery

considering distribution losses and intra-state transmission loss trajectory as informed by state for the FY 2015-16 to FY 2018-19.

Table-4.3

ANNUAL ENERGY & PEAK DEMAND REQUIREMENT AT STATE PERIPHERY					
PARTICULARS	Unit	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Energy requirement as per demand projections	MU	39377	43751	48624	54054
Distribution losses*	%	22.20	20.40	18.80	17.10
Intrastate transmission losses**	%	2.48	2.46	2.44	2.42
Energy requirement at state periphery	MW	51901	56350	61380	66821
Peak Demand at 0.6298 Load Factor (LF) (LF taken as per 18 th EPS)	MW	9407	10214	11126	12112

*As per state power utilities

**As per tariff order FY 2014-15

The load factor of 62.98% has been considered based on the data furnished in 18th EPS report for the year FY 2018-19.

The detailed calculation of energy demand under different categories in the state up to FY 2018-19 is given in Annexure-III.

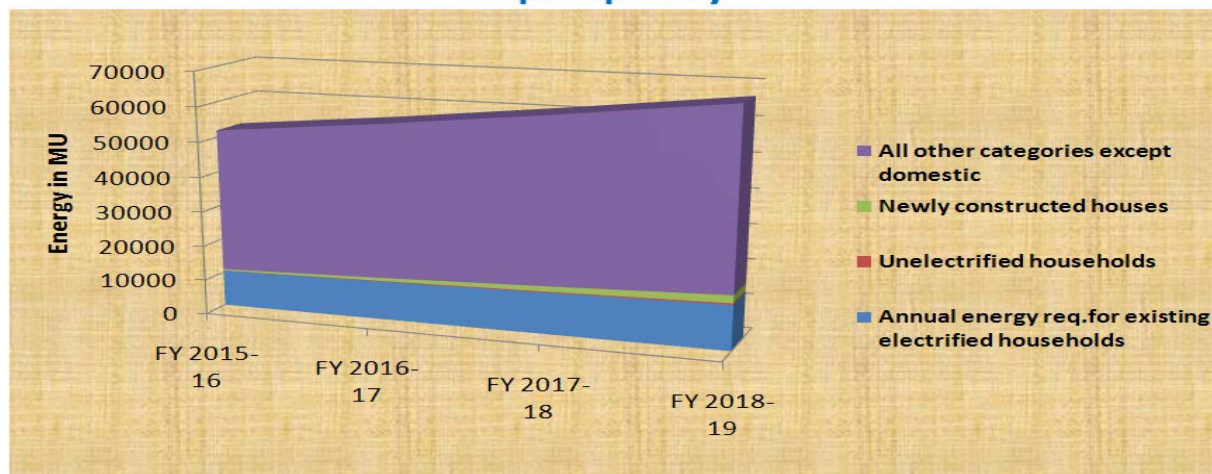


Keeping in view the unrestricted demand, the energy requirement at consumers end is estimated as 54.05 BU which corresponds to 66.82 BU at state periphery (considering distribution losses and intra-state transmission loss trajectory as informed by state) for all categories of consumers by FY 2018-19. The maximum demand requirement of the state is projected to increase to around

12112 MW by FY 2018-19.

As per projections made in 18th EPS of CEA, the projected energy demand and peak load for the state of Haryana would be 64.8 BU and 11749 MW respectively in FY 2018-19 as against the now calculated energy demand of 66.8 BUs and peak load of 12112 MW in FY 2018- 19.

Projected annual energy requirement at state periphery



As against energy demand of 66.82 BU in FY 2018-19 at the state periphery, the energy availability projections from all possible sources as per State Generation Plan by FY 2018-19 works out to 75.102 BU (shown in next chapter) indicating a surplus of 8.281 BU.

The adoption of various energy efficiency measures like energy efficient agricultural/irrigation pump-sets, energy efficient lighting (use of LEDs), adopting demand side management

initiatives like introduction of Time of Day (TOD) tariff etc., or by adopting accelerated AT & C loss reduction targets would help in reducing the peak demand and energy requirement of the state.

However, an assessment of the adequacy of Generation, Transmission and Distribution infrastructure has been made in the subsequent chapters to meet the projected demand of about 12112 MW of the state by FY 2018-19 and the same are covered in the subsequent chapters.

CHAPTER – 5: GENERATION PLAN

The generation plan will ensure adequate capacity addition planning & tie ups for power from various sources at affordable price to meet the projected increase in power demand for future. The generation plan includes:

- a. Existing Generation.
- b. Future Generation Plans (Projects under construction and future projects).
- c. Generation capacity required to meet Peak Demand.
- d. Power procurement costs.
- e. Fuel Requirement.
 - Coal requirement based on linkage with CIL.
 - Coal Imports to meet shortfall of Coal.
 - Issues regarding coal procurement plan.
 - Coal requirement based on coal blocks allotted for ongoing projects.
- f. Year-wise capacity addition plan from renewable source (separately for Solar, Biomass, Bagasse etc.).
- g. Action plan of the state.
- h. Fund Requirements.
- i. GoI/ State Government Interventions

Existing Generation Capacity / Availability of Power (as on March' 2015)

The details of existing generating capacity available as on 31.03.2015 for the state of Haryana are shown in Table-5.1 below:

Table -5.1

Existing Generation Capacity/ Availability of Power

Ownership / Sector	MODE WISE BREAK UP (MW)							Grand Total(MW)
	Thermal				Nuclear	Hydro	RES (MNRE)	
	Coal	Gas	Diesel	Total				
State / Partnership	3167.8	0	0	3167.8	0	828.97	62.4	4059.17
IPPs, UMPPs Projects/ Purchase	4645.5	0	0	4645.5	0	250	92	4987.5
Central	729.29	673.14	0	1402.43	100.93	574.51	0	2077.87
TOTAL	8542.59	673.14	0	9215.73	100.93	1653.48	154.4	11124.54

Source: State Power Utilities

As shown in above table, the total generation capacity / availability of power as on 31.03.2015 for the state of Haryana is 11124.54 MW. Out of which 76.79% is from Coal based Thermal, 6.05% is from Gas based Thermal, 0.91% is from Nuclear, 14.86% is from Hydro and balance 1.39% is from Renewable Energy sources.

In terms of ownership, IPPs/UMPPs/purchase has the largest share of 44.83% followed by State Sector/Partnership projects which is about 36.49%. The share of Central Sector Allocation is about 18.68%.

Future plan for augmentation of generation capacity / availability of power:

As per generation Plan of State of Haryana, capacity of around 1484.56 MW is expected to be added by FY 2018-19 (from new projects as well as from allocation from central sector & IPP projects). Out of this, about 549 MW shall be from non-conventional energy sources and about 935.56 MW from conventional sources. As such the total available capacity by FY 2018-19 is expected to be 12609.1MW (11905.7 MW- Conventional and 703.4 MW – Renewable).



Year wise Summary of Generation Capacity / Availability of Power up to FY 2018-19 are indicated in Table-5.2 below:

Table -5.2

Particulars	Year wise existing & likely capacity to be added (MW) – Cumulative				
	As on March 2015	As Planned			
		FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
STATE SECTOR					
• State Thermal	3167.8	3167.8	3167.8	3167.8	3167.8
• State NCE/RNES					
➤ State Small Hydro	62.40	62.40	62.40	62.40	62.40
➤ Solar PV	-	-	20	42	72
CENTRAL GENERATING STATIONS SHARE					
• CGS Thermal	1402.43	1502.43	1533.26	1533.26	1608.63
• CGS Hydro	574.51	676.51	928.51	971.51	1019.91
• CGS Nuclear	100.93	100.93	100.93	100.93	144.93
IPPS PROJECTS/PURCHASE					
• Thermal	4645.5	4645.5	4645.5	4645.5	4645.5
• Hydro incl. 10.8 MW of small hydro	260.8	260.8	300.8	500.8	500.8
JV / PARTNERSHIP PROJECTS					
• Thermal	-	-	-	-	-
• Hydro	828.97	828.97	828.97	828.97	828.97
NCE / RNES (Private/IPPs)					
• Biomass	32.4	39.4	39.4	39.4	39.4
• Bagasse	36	61	61	61	61
• Solar PV	12.8	132.8	457.8	457.8	457.8
TOTAL :	11124.54	11478.54	12146.4	12411.4	12609.1

Source: State Power Utilities

Details break up and details of existing likely to be added year wise is indicated in **Annexure-IV**.

Peaking & Energy Availability to Meet Peak & Energy Demand

Year wise peaking availability has been worked out based on the peaking availability & auxiliary power consumption norms of each plants as per National Electricity Plan (Vol-I) for 12th five year Plan. However 99% contribution (considering 1% withdrawal loss) from capacity added through competitive bidding route (IPP projects-case-I & power purchase through PTC) and 8% from solar

installed capacity has been considered for estimation of Peak demand. Similarly the energy availability in each year has also been worked out based on the PLF & auxiliary power consumption norms of each plant as per National Electricity Plan (Vol-I) for 12th five year Plan and as per the information made available by the State. The availability of peaking capacity and energy availability projection from all possible sources have been worked out up to FY 2018-19 and shown in Table 5.3 below:



Table-5.3

Financial Year	Total Capacity (MW)	Estimated Peak Availability at State Periphery (MW)	Estimated Energy availability at State Periphery	
			Energy from all sources (MU)	Energy from renewable energy sources (MU)
FY 2015-16	11478.54	9216	70543	690
FY 2016-17	12146.40	9479	72426	1380
FY 2017-18	12411.40	9780	73872	1417
FY 2018-19	12609.10	9967	75102	1467

Further, GOH has planned expansion of PTPS, Panipat and DCRTTP, Yamuna Nagar (1X800MW unit at each location) which are very important and are required to be executed expeditiously for meeting the expected power demand of the state beyond FY 2018-19.

Based on the deliberations in the previous text, the scenario in the state emerges as shown in the Table-5.4a below. It could be seen from Table 5.4a that the peak demand of Haryana would be about 12112 MW by FY 2018-19 considering the additional power requirement for providing 24x7 power supply to all in the state. The expected energy requirement at state periphery for FY 2015-16 is about 51901 MU which is likely to increase to 66821 MU by FY 2018-19. It is also observed from Table 5.4a that the state will be facing a shortfall of about 2.03% to 17.71% in terms of peak demand from FY 2015-16 to FY 2018-19. However, during the same period, the state shall have availability of surplus energy in the range of 35.92% to 12.39%. It is worth mentioning that Haryana state has a typical demand variation between paddy season (from June to September) and rest of the year. During paddy season the demand touches its maximum but reduces to almost half during rest of the time.

In order to mitigate seasonal load variation, Government of Haryana would have to effectively plan through comprehensive power procurement initiatives on short term, medium term & long term basis and look for procurement of power either through competitive bidding or through other sources. Government of Haryana may also arrange additional power during paddy seasons through banking of power with other states having different seasonal load pattern. At the same time, the deficit in peak demand can be effectively reduced through proper implementation of DSM & Energy efficiency measures in the state. The state is also required to give more preference to Hydro & RES while procuring power in order to improve the hydro-thermal generation mix. This will not only help in eliminating the peak shortage of the state but will also balance the energy supply & demand scenario. The generation mix as per the proposed generation plan of the state is shown in Table-5.4b.

Table -5.4a

Sl. No.	Power Supply Position	Unit	Year wise Figures			
			FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
1	Peak Requirement at state periphery (L.F. = 0.6298)	MW	9407	10214	11126	12112
2	Estimated Peak Availability at state periphery	MW	9216	9479	9780	9967
3	Surplus(+) / Deficit(-)	MW	(-) 191	(-) 735	(-) 1346	(-) 2145
4	Surplus (+) / Deficit(-)	%	(-) 2.03	(-) 7.20	(-) 12.09	(-) 17.71
5	Energy Requirement at State Periphery	MU	51901	56350	61380	66821
6	Estimated Energy Availability at State Periphery	MU	70543	72426	73872	75102
7	Surplus(+) / Deficit(-)	MU	(+) 18642	(+) 16076	(+) 12492	(+) 8281
8	Surplus(+) / Deficit(-)	%	(+) 35.92	(+) 28.53	(+) 20.35	(+) 12.39

Table -5.4b

Generation Mix				
Financial Year	Thermal (%)	Hydro (%)	Nuclear (%)	RES (%)
FY 2014-15	82.84	14.86	0.91	1.39
FY 2015-16	81.16	15.29	0.88	2.67
FY 2016-17	76.95	16.86	0.83	5.36
FY 2017-18	75.31	18.45	0.81	5.43
FY 2018-19	74.72	18.55	1.15	5.58

Issues Regarding Coal Procurement Plan:**Coal Requirement:**

Generating Stations in Haryana are required to perform at higher PLF (ideally at 80 to 85% (Gross generation) enabling state of Haryana to

achieve “24 x 7 Power for All” for which there should not be any constraint of coal supply. The current coal scenario and the projections for next 5 years have been presented below in Table-5.5.



Table-5.5

Sl. No.	TYPE	Year wise Domestic Coal Requirement (Million Tonnes per Annum)				
		FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
1	Domestic Raw Coal Requirement					
	PTPS- Panipat	6.60	6.60	6.60	6.60	6.60
	DCRTPP-Yamunanagar	2.80	2.80	2.80	2.80	2.80
	RGTPP-Hisar	6.63	6.63	6.63	6.63	6.63
	Total Requirement	16.03	16.03	16.03	16.03	16.03
2	Coal Linkage					
	PTPS- Panipat	6.60	6.60	6.60	6.60	6.60
	DCRTPP-Yamunanagar	2.80	2.80	2.80	2.80	2.80
	RGTPP-Hisar	4.79	4.79	4.79	4.79	4.79
	Total linkage	14.19	14.19	14.19	14.19	14.19
3	Shortfall in domestic raw coal as per linkage	1.84	1.84	1.84	1.84	1.84
4	Materialization of raw coal from CIL as per existing linkage	84.92%	84.92%	87.60%	87.60%	87.60%
5	Short fall due low materialization	2.14	2.14	1.76	1.76	1.76
6	Total Shortfall in domestic Raw Coal as per requirement	3.98	3.98	3.60	3.60	3.60
7	Additional domestic raw coal requirement to be met with increased domestic coal supplies or through import	3.98	3.98	3.60	3.60	3.60

Source: State Power Utilities

The shortfall in fuel from domestic coal linkage needs to be met through import or through additional coal linkage from GoI on a time-to-time basis.

In addition to above, Haryana state utility

requires imported coal to meet the total coal requirement of state owned power plants. The details of expected import of coal to meet present as well as future requirement/shortfall are given in Table below:

Table-5.6

Sl. No.	Particulars	Imported Coal Requirement (in Million Tonnes Per Annum)				
		FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
	Requirement of imported coal					
1	PTPS- Panipat	1.13	1.13	1.13	1.13	1.13
2	DCRTPP-Yamunanagar	0.40	0.40	0.40	0.40	0.40
3	RGTPP-Hisar	0.94	0.94	0.94	0.94	0.94
	Total Requirement	2.47	2.47	2.47	2.47	2.47

Source: State Power Utilities



Issue related to Coal Block & expansion of PTPS, Panipat and DCRTTP, Yamuna Nagar

- Kalyanpur – Badalpara coal block (at Dumka, Jharkhand), having coal reserves of about 102 Million Tonnes, had been allotted by Ministry of Coal (MoC) in Sept, 2013 to HPGCL and UPRVUNL for joint use (50:50 ratio). However, MoC vide letter dated 31.03.2015 informed its decision to allocate full reserves (102 MT) of Kalyanpur-Badalpara coal block to the Power-Generation company (ies) of Government of Haryana (GoH). GoH has decided to use full reserves of Kalyanpur-Badalpara coal block for meeting the coal requirement of HPGCL's proposed 1X800 MW Supercritical expansion Unit at DCRTTP Yamunanagar. Surplus coal, if any, will be used for meeting the partial coal requirement of 1X800 MW Supercritical expansions unit at Panipat Thermal Power Station, Panipat. Accordingly, MOC has been requested for issue of detailed allotment letter in the name of HPGCL, so that HPGCL may proceed with development of the coal block. HPGCL has also taken up the matter with CMPDI regarding preparation of detailed Geological Report (GR) for this coal block.
- Matter regarding temporary linkage of coal for the intervening period from commencing of the project (expected from

3rd quarter of FY 2020-21) till start of production from coal block (expected from FY 2022-23) has been taken up with Secretary, Ministry of Coal vide ACS (power) DO letter dated 24.12.2014.

- MoE & F's ToR dated 06.04.2010 for conducting EIA/EMP studies for installation of 1 X 800 MW unit at DCRTTP has expired on 05.04.13 due to non – finalization of coal linkage with MoC. MoE&F has advised HPGCL to apply afresh for the ToR. The application for fresh ToR can be applied either after stage-I Forest clearance for Kalyanpur-Badalpara coal block or after temporary allocation of coal by MoC.
- On 23.04.15, MOC has approved transfer of coal linkage of old units 1 to 4 of PTPS (110 MW each, to be phased out), to new proposed 800MW supercritical unit at PTPS, Panipat. MoC has further requested Coal India limited to take further necessary action in this matter. With blending ratio of 70: 30 of Indian and Imported coal, it is expected that requirement of coal for proposed 800MW unit will be almost met with.

Action Plan – State

To complete the generating capacities of State and to monitor the Central Sector & Private Sector Projects as per following Roll out Plan :

Table -5.7

Description	Power for All – Roll Out Plan (MW)				
	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total
Generation (State Sector)	-	-	-	-	-
NCE / RNES including state RES (solar PV)	152	345	22	30	549
JV / Partnership Projects	-	-	-	-	-
Central Sector	202	282.83	43	167.77	695.6
IPP Projects/Purchase	-	40	200	-	240
TOTAL	354	667.83	265	197.77	1484.6

The state is required to:

- Take up the matter of coal linkage / environment clearance with Ministry of Coal and MoEF for the existing as well as expansion projects & development of

Kalyanpur-Badalpara coal block as per requirement.

- To firm up plan for meeting the deficit in peak demand through banking of power



with other states having different seasonal demand.

- To procure more peaking power, if required, from the market to meet the peak shortage for providing 24x7 power in the state.
- To improve the generation mix (Thermal: Hydro ratio) through more tie up from hydro & renewable sources in order to stave off the peak shortage and to balance the energy supply and demand scenario.
- To take the matter with MoP, GoI for more allocation from Central Sector projects (hydro & gas based) to Haryana for meeting the peak demand.
- To firm up plan for R & M of Unit# 5 of PTPS, Panipat.
- To Expedite implementation of future expansion units (800MW each) of PTPS & DCRTTP projects.
- To firm up plan to reduce peak demand through demand side management and energy efficiency measures.
- To firm up plan to meet the shortfall in fuel either through additional domestic coal linkage from GoI or through import on a time to time basis.

POWER PURCHASE PLANNING

The state will work towards institutionalizing and strengthening the Power Purchase Planning and Procurement cell, which will dedicatedly work on the short/medium/long term power purchase planning and work on the procurement of power on cost effective basis.

This cell will also work on the monthly power availability from already tied-up sources (on the basis of annual schedules provided by these sources) and accordingly work out the

requirement for tying up power through competitive bidding route keeping into consideration the huge seasonal variation in availability of energy from various sources across the year. In this regards the power management cell, HPPC has already been constituted and working towards achieve this goal.

Government of India (GOI) Intervention Required

- Ministry of Coal (MOC) needs to be requested for issuing allotment letter of Kalyanpur-Badalpara coal block in the name of HPGCL at the earliest so that HPGCL may proceed with the activities relating to development of this coal block and further activities relating to 800 MW Supercritical Unit at DCRTTP, Yamuna Nagar.
- Ministry of Environment & Forest (MOE&F) to be requested to explore the possibilities of reducing the time period for granting various clearances/approvals etc. in regard to development of Kalyanpur-Badalpara coal block.
- Ministry of Coal needs to be requested for considering grant of temporary linkage for the intervening period from commercial operation of the 1 X 800MW unit (expected from 3rd quarter of FY 2020-21) at DCRTTP, till start of production of coal (expected from FY 2022-23) from Kalyanpur-Badalpara coal block so that activities which are held up for want of coal linkage for this unit could be resume.

Fund Requirement:

The detail of estimated fund requirement of the State Sector Projects and JV Projects where state is a partner is given in tables below:



(a) For State Sector Projects:

Table-5.8

Type	Total Cost of Project	Expenditure up to March 2015	Year wise Fund Requirement (Rupees in Crores)				Tie Ups for Fund
			FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	
Projects under Expansion							
1 X 800MW unit at PTPS, Panipat	4553.40 (*)	NIL (30% equity to be funded)	158.46	302.03	382.76	379.75	70% debt (Rs. 3187.38 Crores) will be arranged through loan from financial institutions. Expected COD 3 rd Quarter of FY 2019-20
1 X 800MW unit at DCRTPP, Yamuna Nagar	4553.40 (*)	NIL (30% equity to be funded)	0	158.46	302.03	382.76	70% debt (Rs. 3187.38 Crores) will be arranged through loan from financial institutions. Expected COD 3 rd Quarter of FY 2020-21
Total	9106.8	2732.04	158.46	460.49	684.79	762.51	

(*) Project cost excluding land as on April 2015 as per DPR.

CHAPTER – 6 : TRANSMISSION PLAN

The present peak power demand and energy requirement for the State of Haryana is of the order of 9152 MW and 46615 MU (for FY 2014-15). The Power demand in the coming years would increase significantly due to various factors i.e. increase in the agricultural consumptions, increase in demand of existing consumers due to increased uses of various appliances, commercial activities and industrialization etc. in the State. Exponential load growth has been experienced in the NCR area. Considering all the above factors into account and with an objective to provide 24x7 power supply to all, the expected power demand of Haryana by FY 2018-19 would be in the order of 12112 MW with annual energy consumption of 66821 MU. To meet this growing demand, a robust and reliable Inter-State & Intra-State transmission network are required. For this, existing transmission system would be strengthened both at Inter State level as well as Intra State level with proper planning to cater the demand in a reliable manner considering 24X7 Power for All.

Inter State Transmission System (ISTS)

Presently about 6190 ckt km EHV transmission line comprising of 765 kV (500 ckt km) 400 kV (5590 ckt km) and 13 nos. of Grid sub-stations (1 no. 765/400 kV, 12 nos. 400/220 kV Sub-station) with total transformation capacity of 12060 MVA are existing in Haryana under Inter-State Transmission system. In Haryana there is one no. Central Generating stations (CGS) i.e. IGSTPP (1500 MW). Out of this 750 MW has been allocated to Haryana and remaining 750 MW has been allocated to NCT of Delhi. The details of Inter-State transmission system, to transfer the power from the existing inter-state generating station (ISGS) are listed below:
IGSTPP Thermal Power plant:

- Jhajjar – Mundaka 400kV D/C (DTL)
- Jhajjar – Daulatabad 400kV D/C

The existing Inter-State Transmission capacity at 400/220 kV level is 10060 MVA consisting of 12 nos. of Substations. The details of existing ISTS Sub-stations in Haryana are as under:

Table-6.1

Details of Existing Grid sub-station (ISTS)

SL No.	Name of GSS	Voltage Ratio	No. of Transformers	MVA capacity	Total Transformer capacity(MVA)
765 kV GRID SUBSTATION					
1	765KV Dhana Narsan (Bhiwani)	765/400 kV	2	1000	2000
Total					2000
400 kV GRID SUBSTATION					
1	Abdullapur	400/220 kV	4	315	1260
2	Ballabhgarh	400/220 kV	4	315	1260
3	Sonepat	400/220 kV	2	315	630
4	Bahadurgarh	400/220 kV	1	315	315
		400/220 kV	1	500	500
5	Sector-72 Gurgaon	400/220 kV	2	315	630
6	Hisar	400/220 kV	3	315	945
7	Kaithal	400/220 kV	2	315	630
8	Fatehabad	400/220 kV	2	315	630
9	Jind	400/220 kV	2	500	1000
10	Panchkula	400/220 kV	2	315	630
11	Manesar	400/220 kV	2	500	1000
12	765 kV Bhiwani	400/220 kV	2	315	630
Total :					10060

Source: State Power Utilities



In order to facilitate the drawl of power by Haryana and to meet the projected peak load of 12112 MW by 2018-19, a robust Inter-State transmission system (ISTS) has been planned. The present ISTS system capacity at 400/220 kV level is 10060 MVA and it shall be increase to 24520 MVA including PGCIL, HVPNL, BBMB Transformation capacity by FY 2018-19 after the implementation of ongoing schemes, which shall take care the increased power demand of Haryana up to FY 2018-19.

The various ongoing ISTS projects are outlined below. :

On-going /Under planning ISTS projects:

New Substations & Transmission lines

- One 800 kV HVDC substation at Bhadson (Kurukshetra) with 3000 MVA (1st phase) capacity along with associated transmission lines are under construction.

- Three (3) numbers of 400/220 kV substations viz. Qadarpur (Gurgaon) (2x500 MVA, 400/220 kV), Sohna Road Gurgaon (2x500 MVA, 400/220 kV) and Prithla (Palwal) (2x500 MVA, 400/220 kV) with associated transmission lines have been approved in 35th Standing Committee on Power System Planning for Northern Region and have been notified for implementation through TBCB route.
- A high capacity 400kV D/C Quad line is under construction from Dehradun to Abdullapur. This line would facilitate Haryana to access hydro power from Uttarakhand area .
- Further thermal power from Eastern region would be accessed through Bareilly-Roorkee- Saharanpur 400kV D/C line of POWERGRID.
 - Dehradun- Abdullapur 400kV D/C (Quad) –240 ckm

The details of proposed planning in the following time frame of new/augmentation of sub-stations are as follows:

Table-6.2

Project	Voltage Level	Unit	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19*
Inter-State Transmission Network	800 kV DC	No./MVA	1/3000	1/3000		
	400 kV	No./MVA	1/1000	3/1815	3/3315	
	220kV	No./MVA				

Source:PGCIL/ State Power Utilities

Note: The detailed break-up of above capacity is given in Annexure-VII-A & B.

Augmentation on existing sub-stations

To meet the growing power demand of Haryana, augmentation of transmission capacity in following substations has been undertaken by PGCIL. This would enable Haryana to draw its share of power from the Grid:

Proposed Augmentation during FY 2016-17

- Augmentation of Transformation capacity at Gurgaon by 2x500 MVA 400/ 220kV Transformer (Total capacity 1000 MVA)
- Augmentation of Transformation capacity at Panchkula by 1x500 MVA 400/220 kV Transformer (Total capacity 500 MVA)

- Augmentation of Transformation capacity at Kaithal by 1x315 MVA 400/ 220kV Transformer (Total capacity 315 MVA)

Proposed Augmentation during FY 2017-18

- Augmentation of Transformation capacity at Fatehabad by 1x315 MVA 400/ 220kV Transformer (Total capacity 315 MVA)

On-going Tariff Based Competitive Bidding (TBCB) Schemes:

Creation of new 400kV substations in Gurgaon area and Palwal area as a part of ISTS has been notified for implementation under TBCB.



The system would strengthen the power supply around Gurgaon and Palwal area and would ensure reliable and quality supply of power.

- Establishment of 2X500 MVA, 400/220 kV substations at Kadarapur & Sohna Road in Gurgaon area and Prithla in Palwal area.
- Creation of 400kV level at Aligarh substation by adding 2x1500MVA 765/400kV ICTs.
- Aligarh – Prithala 400kV D/C Quad line.
- Prithala – Kadarapur 400kV D/C Quad line.
- Kadarapur – Sohna Road 400kV D/C Quad line.
- LILO of both circuits of Gurgaon – Manesar 400kV D/C at Sohna Road S/s.
- Neemrana – Dhanonda (HVPNL) 400kV D/C Quad line.

Inter and Intra State Transmission plan for evacuation of power from existing and upcoming Renewable Energy sources. Balancing Infrastructure envisaged for integration of large scale renewable.

The existing renewable energy generation including small hydro generation of Haryana is of the order of 154.4 MW which would increase up to 433.4 MW by FY 2018-19. The power evacuation from renewable generation shall be evacuated at distribution level of 33 kV and 11 kV from existing 33/11 kV PSS from small scale scattered generation. If high capacity renewable energy evacuation is required in future then 132/33 kV and 66/33 kV GSS spread throughout the State, will take care power evacuation from these renewable generations.

Renewable Energy Management centers proposed for Real time monitoring of Generation from RE sources:

Due to low Renewable Energy Generation, presently there is no Management center is in place.

Adequacy to meet Power Transfer requirement of the State till FY 2018-19

The present ISTS system capacity at 400 kV CTU level is 10060 MVA, 5355 MVA, at 400/220 kV HVPNL substation level and 1400 MVA at 400/220 kV BBMB substation level which makes the total capacity at 400/220kV level to 16815 MVA in the state of Haryana. This shall be increased to 24520 MVA (including HVPNL & BBMB capacity at 400 kV) by FY 2018-19 after implementation of ongoing schemes to cater the peak power demand of Haryana of 12112 MW by FY 2018-19.

In addition to the above, the State ISTS network is also evacuating the power at 220 kV level and below from the following Generating units.

- Panipat TPP, DCR TPP (2X300MW), WYC HEP, Yamunanagar & Kakroi, Faridabad Gas (GT4X130.9 MW & STG 2x154.51 MW),
- Renewable Energy Sources (availability-703.4 MW).

The net power being evacuated from the above units at 220 kV level & below is 1923 MW in FY 2014-15, 1951 MW in FY 2015-16 & 2004 MW from FY 2016-17 onward up to FY 2018-19. The projected power demand of Haryana by FY 2018-19 shall be 12112 MW (13458 MVA). Considering drawl of about 2004 MW (2227 MVA) of power from the state generating units at 220 kV and below, the balance power to be evacuated at 400 kV level shall be 10108 MW (11231 MVA) by FY 2018-19. Considering 70% loading on transformers and overall diversity of 1.2, minimum transformation capacity required is 1.7 times the projected peak demand (MVA) i.e 19093 MVA (=1.7X11231MVA).



The year wise generation addition, total available capacity viz-a-viz transmission system available at 220 kV level for Haryana is tabulated as under:

Table-6.3

Year	Generation Within Haryana – Intra state (MW)		Inter state (ISGS) – Generation for Haryana (MW)		Total Available capacity (MW)	Peak Power Demand of Haryana to be evacuated at 400kV level (Peak power demand - Power evacuated at 220 KV level and below.) (MW)	Minimum Transfor mation capacity required at 400kV level (MVA)*	Transmission System existing/Planned at 400 kV level including PGCIL & HVPNL (Interstate &Intrastate) 400 KV GRID S/S (MVA)
	Addition	Total	Addition	Total				
As on July 2015		5685		5439	11125	9152-1923=7229	13655	16815
FY 2015-16	152	5837	202	5641	11479	9407-1951=7456	14084	17815
FY 2016-17	345	6182	323	5964	12146	10214-2004=8210	15508	20260
FY 2017-18	22	6204	243	6207	12411	11216-2004=9212	17400	23890
FY 2018-19	30	6234	168	6375	12609	12112-2004=10108	19093	24520

* Minimum Transformer capacity in MVA = Peak Power Demand at distribution level (in MW/0.9 x 1.7).

As such it is evident from the above table; the existing and planned ISTS System is very much adequate to meet the projected peak demand of Haryana up to FY 2018-19.

Action Plan – CTU

- Ongoing schemes (New Substation & Transmission line) shall be implemented as per schedule by PGCIL/TBCB route for ensuring robust transmission system.
- The Haryana State is part of northern grid at various Extra High Voltage (EHV) level.
- Load restriction presently being imposed by the Northern Regional Load Despatch Centre (NRLDC) during emergency to feed the National Capital Region (NCR). After commissioning of ongoing transmission network such type of the problem may be overcome.

Action Plan – GOI

The GOI has undertaken up a transformative change programme in the power sector so as to ensure affordable 24x7 power for all homes, industrial and commercial establishments and adequate power for all, in the next few years.

Wherever necessary, clearances (Railway clearance, forest clearance etc.) as required shall be expedited at the highest level for timely completion of the project.

Intra State Transmission System:

The existing Intra state transmission capacity at 400 kV and 220 kV level is 5355 MVA and 17040 MVA respectively. Further, at 220 kV level the transformation capacity is (220/132 kV – 10040 MVA, 220/66 kV – 5540 MVA & 220/33 kV – 1460 MVA) including BBMB sub-station capacity.

The ongoing strengthening program of existing Intra-State transmission system is under implementation up to FY 2018-19. After implementation of this plan, the existing transformation capacity shall increase to 29810 MVA at 220/132 kV, 220/66 kV and 220/33 kV level.

Intra State Transmission System (Present):

The transmission network comprising of 384 substations (July 2015) of various voltage levels presently caters to the load demand across the State.



- 7 Nos. of 400/220 kV grid substations (Nawada, Kirori, Daultabad, Deepalpur, Kaboolpur, Nuhiyawali & Dhanonda) and 2 Nos. 400/220 kV grid substations of BBMB (Panipat & Bhiwani) with 6755 MVA (400/220 kV) substation installed capacity and 813.4 km of associated lines.
- 68 Nos. of 220 kV grid substations with 17040 MVA substation installed capacity and 5090.24 ckm of associated lines.
- 181 Nos. of 132 kV grid substations with 11732.5 MVA substation installed capacity and 4472.53 ckm of associated lines.
- 128 Nos. of 66 kV grid substations with 6555.5 MVA substation installed capacity and 2968.30 ckm of associated lines.

Note: List of existing 400 kV & 220 kV substations and transmission lines is enclosed as Annexure-V.

Details of Ongoing / Planned Intra-State Transmission system.

New sub-stations / Transmission lines

- 1 No. of 400 kV substations at Farukhnagar with 630 MVA (2x315 MVA, 400/220 kV) capacity and 10 km transmission lines are planned for implementation during FY 2018-19.
- 33 Nos. of 220 kV grid substations with 7840 MVA capacity and 747.16 km transmission lines is planned for implementation up to FY 2018-19.
- 10 Nos. of 132 kV grid substations with 670 MVA capacity and 637.26 km transmission lines is planned for implementation up to FY 2018-19.
- 23 Nos. of 66 kV grid substations with 1342.5 MVA capacity and 440.6 km transmission lines is planned for implementation up to FY 2018-19.

The year wise proposed plan of new sub-station and Transmission lines are as follows:

Table-6.4

Project	Voltage Level	Unit	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Intra-State Transmission Network	400 kV	No./MVA				1/630
		ckt. km.	5.5	35		10
	220kV	No./MVA	9/2120	5/1340	8/1840	11/2540
		ckt. km.	261.5	385.66	51	49
	132 kV	No./MVA	4/145	1/75	4/375	1/75
		ckt. km.	146	121.46	338.3	31.5
	66 kV	No./MVA	10/490.5	0/79	9/505	4/268
		ckt. km.	87.5	239	104.1	10

Augmentation on existing sub-stations

- 3 Nos. of augmentation at 400/220 kV level with capacity addition of 945 MVA is planned for implementation.
- 49 Nos. of augmentation at 220 kV level with capacity addition of 4930 MVA is planned for implementation.
- 134 Nos. of augmentation at 132 kV level with capacity addition of 3454 MVA is planned for implementation.
- 91 Nos. of augmentation at 66 kV level with capacity addition of 1420 MVA is planned for implementation.



The year wise proposed augmentation plans on existing sub-stations are as follows:

Table-6.5

Project	Voltage Level	Unit	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19*
Intra-State Transmission Network	400 kV	No./MVA		2/630	1/315	-
	220kV	No./MVA	2/200	27/2790	20/1940	-
	132 kV	No./MVA	48/1220	27/660	59/1574	-
	66 kV	No./MVA	39/602.5	21/361	31/456.5	-

*Transmission works for FY 2018-19 shall be reviewed in the forthcoming integrated planning.

Source: State Power Utilities

The details of year wise ongoing/ planned Intra-State transmission system as enclosed as Annexure-VI.

Adequacy to meet Power Transfer requirement of the state till FY 2018-19

The year wise peak power demand of State, viz-a-viz transmission system available at 220 kV level for Haryana is tabulated as under:

Table- 6.6

Year	Peak power demand (MW)		Minimum Transformation capacity required (MVA) *	Transmission System existing/Planned at 220 kV level (MVA)	
	Addition	Total		Addition	Total
As on July 2015		9152	17287		17040
FY 2015-16	255	9407	17768	2320	19360
FY 2016-17	807	10214	19293	4130	23490
FY 2017-18	1002	11216	21185	3780	27270
FY 2018-19	896	12112	22879	2540	29810

* Minimum Transformer capacity in MVA = Peak Power Demand at distribution level (in MW/0.9 x 1.7).

As such, the existing Intra-state transmission system of Haryana is adequate to meet the projected peak demand of Haryana of 12112 MW by FY 2018-19 both at 220 kV level as well as downstream level.

Year wise fund requirement for development of Planned Transmission system:

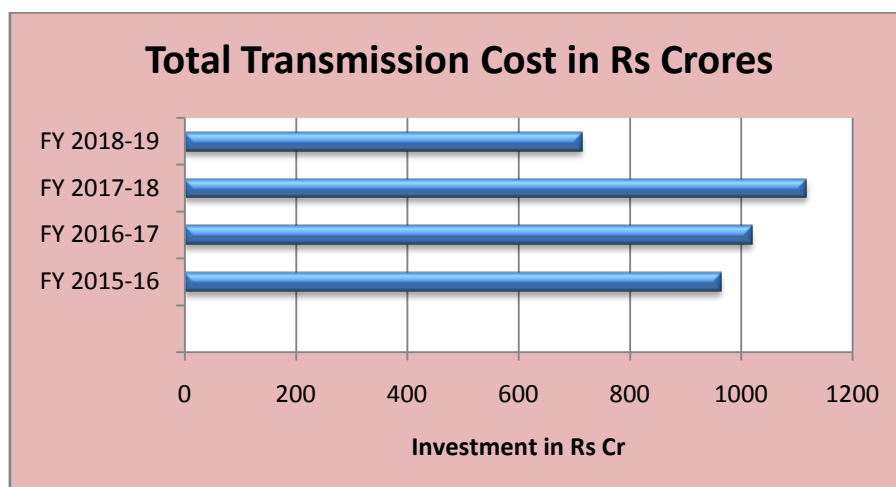
Total estimated investment of about Rs. 3810 Crores from FY 2015-16 to FY 2018-19 has been envisaged for intra State system.

(Details of year wise investment plan for transmission infrastructure for FY 2015-16 to FY 2018-19 is enclosed as **Annexure –VI**.)



Year wise details of Physical targets and proposed investments

Details of tentative investment plan for FY 2015-16 to FY 2018-19 is as below:



Action Plan – HVPNL (STU)

The ongoing scheme needs to be implemented as per proposed plan for ensuring 24x7 power supply in State. Financial tie up for approved infrastructure shall be undertaken timely with the funding agencies and it is envisaged that State Govt. shall provide 20% equity support.

State Government intervention

- The proposed transmission system up to FY 2018-19 needs to be implemented as per schedule for ensuring 24x7 powers supply in the State.
- The State government shall expedite all necessary help (i.e. Right of Way clearance, Forest clearance if any, land acquisition etc) to STU for installation of new substation and associated transmission lines to provide 24x7 power to all in Haryana.
- Investment of about Rs. 3810 Crores from FY 2014-15 to FY 2018-19 has been envisaged for intrastate transmission system. Financial tie up with financial institutions for transmission infrastructure is not a concern, however, the equity support of about 20% will be required and State needs to make adequate budgetary provision.

Government of India intervention

- **Mitigation of Right of way constraints and availability of land:** Formation of Policy by the Government of India to provide uniform compensation for acquiring the Right of Way for transmission lines.
- Upgrading of existing transmission lines with high capacity conductor to meet reliability criteria. It will involve high costs. Intervention at the level of Government of India needed.
- Adoption of the GIS technology at new substations specifically in the urban area (NCR Area) having land scarcity and Government of India intervention for cost reduction of Gas Insulated Substation (GIS) technology is required.

Initiatives taken by the State on SCADA and OPGW

State Load Despatch Centre (SLDC) at Panipat, was established during the year FY 2001-02 under Unified Load Despatch and Communication (ULDC) scheme for Northern Region, with real-time data from 41 Remote Terminal Units (RTUs). Subsequently, 15 Nos. Substation Automation System (SAS) based substations / generating stations real-time data



have been integrated with the SCADA System. In the present scenario, 56 Substations / generating stations of Haryana are being monitored through SCADA along with other NR States stations. The expansion and up-gradation of the existing SLDC system in Haryana has been divided into two parts:

- A. SCADA / EMS System up-gradation / replacement through POWERGRID under Unified scheme of NR constituents Phase-II - Recovery of investment through tariff is in place.
- B. Strengthening the communication system, auxiliary power supply and providing RTUs etc.

OPGW Laying (Package-1)

Laying of Optical Fibre Ground Wire (OPGW) on 220 kV and above transmission line towers have been installed and about 200 kms of OPGW have been installed. The above network (approx. 1853 kms.) would be used as a wideband communication backbone. The installation work is scheduled to be completed very soon.

Communication Equipment (Package-2)

Synchronous Digital Hierarchy(SDH), Plesiochronous Digital Hierarchy(PDH), Multiplexer (MUX) at about 94 Nos. wideband communication nodes, 51 Nos. new PLCC links, 6 Nos. Point-to-point radio communication links, Auxiliary power supply system and PABX exchanges are to be installed under this package. The work is going through its engineering stages and installation work will start soon. The work is scheduled to be completed during Nov. 2015.

Remote Terminal Units (RTUs) (Package-3)

Installation of 162 Nos. RTUs at 66 kV, 132 kV and 220 kV Sub Stations to cover these Sub Stations under SCADA monitoring are underway. The detailed architecture of first lot of 41 Nos. RTUs have been approved and the Factory Acceptance Test (FAT) of this lot is under process. Installation work at sites is likely to start soon. The work is scheduled to be completed during Nov. 2015.



CHAPTER – 7 : DISTRIBUTION PLAN

Distribution system of Haryana State is being served by two distribution companies, Uttar Haryana Bijli Vitran Nigam (UHBVN) and Dakshin Haryana Bijli Vitran Nigam (DHBVN). These companies are serving about 53.81 lakhs of electricity consumers including about 5.83 lakhs under agriculture category during FY 2014-15.

As per Government of Haryana (GoH), as on 1st April 2015 there are about 53.29 lakhs households in the state (32 lakhs are in rural area and 21.29 lakhs are in urban area). Out of total 53.29 lakhs households, about 50.43 lakhs households are electrified (29.14 lakhs are in rural area and 21.29 lakhs are in urban area). Although all the urban households are electrified but there are still around 2.85 lakhs un-electrified households in the rural areas as on 1st April 2015.

As on June 2015, daily electricity for about 12 hours is being provided in the rural areas and 24 hours is being provided in the urban areas. The state has been supplying electricity to agriculture consumers for 8 hrs on daily basis

which is considered adequate for meeting the agricultural requirement and there is no planning to increase it further.

The DT failure rate for UHBVN and DHBVN is 6.1 % and 7.08 % respectively. During the period between FY 2005-06 and FY 2014-15, the HT to LT ratio has been increased from 0.59 to 1.05.

Existing Distribution system as on 31st March 2015

There are 872 Nos. of Power Sub-Stations (consisting of 132/11kV, 66/11kV, 33/11kV & 33/3.3kV), 4,87,303 Nos. of Distribution Transformers, 1,15,710 ckt kms of low tension lines, 1,24,213 ckt kms of 11 kV lines and 5,758 ckt kms of 33 kV lines in the state of Haryana.

The total installed capacity of HT Power Transformers and Distribution Transformers (DTs) is 25,460 MVA and 28,616 MVA respectively. The discom-wise details of distribution system as on 31st March 2015 are indicated in Table 7.1 below:

Table-7.1
Discom-wise Distribution System Details as on 31.05.2015

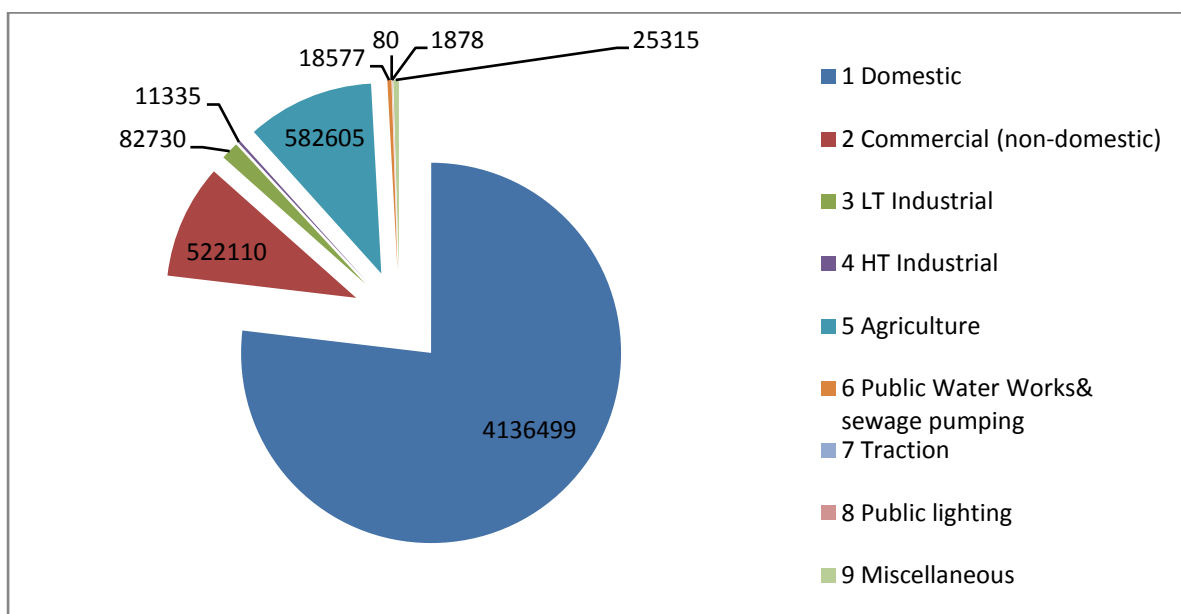
Sl. No.	Description	Unit	UHBVN	DHBVN
1.	Total Length of 33 kV line	Ckt kms	2520.55	3237.3
2.	Total Numbers of 132/11kV, 66/11kV 33/11kV & 33/3.3kV Power Sub-stations	Nos	438	434
3	Total Capacity of 33/11kV & 33/3.3kV Power Sub-stations	MVA	8482	9482
4.	Total Numbers of DTs	Nos	250350	236953
5.	Total Capacity of DTs	MVA	10744	11560.5
6.	Total Length of 11 kV line	Ckt kms	55056	69157
7.	Total Length of LT line	Ckt kms	52753	62956.8

Source: State Power Utilities



Category Wise Consumers

The number of consumers (category wise) as on 31.03.2014 is shown below:



Discoms important facts FY 2014-15

Category	Power Supplied (%)	% Distri-bution Loss	Share in Distri-bution Loss (%)	AT&C Losses (%)	Share in AT&C losses (%)	Share in Cash Deficit (Rs. Cr.)
Rural Domestic	22.50%	63.58%	14.30%	63.99%	14.40%	1895
Urban Mixed	30.65%	24.43%	7.49%	25.19%	7.72%	1016
Agriculture	23.20%	17.81%	4.13%	17.91%	4.16%	547
Industrial	10.99%	2.96%	0.33%	3.09%	0.34%	45
Inde-pendent	12.66%	6.82%	0.86%	6.94%	0.88%	116
Total :	100%		27.11%		27.49%	3618

Source: State Power Utilities

STATUS OF ON-GOING DISTRIBUTION SCHEMES IN THE STATE

RAPDRP

Ministry of Power, Govt. of India, has launched Restructured Accelerated Power Development and Reforms Program (R-APDRP) in the XIth Five year Plan as a Central Sector Scheme to cover urban areas - towns and cities with population of more than 30,000 as per Census of 2001. Power Finance Corporation Limited (PFC) has been designated as the Nodal Agency for this program. The focus of R-APDRP Programme is on Actual Demonstrable Performance in terms of sustained loss reduction in distribution

network. Establishment of reliable and automated systems for sustained collection of accurate base line data, and the adoption of Information Technology in the areas of energy accounting are essential parts before taking up the regular distribution strengthening projects.

The program is divided into two parts, Part-A and Part-B. Part-A includes projects for establishment of baseline data and IT applications like Meter Data Acquisition, Meter Reading, Billing, Collections, GIS, MIS, Energy Audit, New Connection, Disconnection, Customer Care Services, Web self-service etc and verification of baseline AT&C losses as well as implementation of SCADA/DMS (Supervisory



Control And Data Acquisition/Distribution Management System).

Part-B includes regular distribution strengthening projects. The focus for Part-B is loss reduction on sustainable basis through Renovation, modernization and strengthening of 11 kV level Substations, Transformers/Transformer Centers, Re-conductoring of lines at 11kV level and below, Load Bifurcation, Feeder Separation, Load Balancing, HVDS (11kV), Aerial Bunched Conductor in dense areas, replacement of electromagnetic energy meters with tamper proof electronic meters, installation of capacitor banks and mobile service centre, etc.

PART-A

IT implementation agency was appointed for implementation of R-APDRP-A scheme in 36 towns (with population of more than 30000), 20 towns of UHBVN and 16 towns of DHBVN including establishment of centralized data centre at Hisar, Customer Care Centre at Gurgaon, and Centralized Data Recovery Centre at Panchkula. The scope covered setting of IT infrastructure at DC & DR subdivision offices and other offices and integration of all the offices with data centre by providing suitable connectivity. Facility Management Services for 5 years after “Go-Live” of the projects have also been kept under scope of ITIA.

IT Implementation has been done in the following areas;

1. Metering, Billing & Collection processes
2. New connection, disconnection, reconnection processes
3. Generation of exception reports from the R-APDRP solution
4. Generation of Energy Audit reports from the R-APDRP Solution
5. GIS based consumer indexing and asset Mapping

6. GIS based Integrated Network Analysis Module
7. Centralized Customer care services
8. Management Information System (Data Warehouse)
9. Asset Management and Maintenance Management.
10. Web Based Self Service Portal
11. Identify and Assess Management System
12. System Security requirement
13. Development of Commercial Data Base of consumers
14. Out of 36 towns awarded, 23 towns have been declared “Go-Live”.

Highlights of Part-A in the state of Haryana are:

- The scheme was sanctioned in September 2009.
- The amount sanctioned by PFC is Rs. 75.16 Cr for 20 no. towns in UHBVN & Rs. 90.47 Cr. for 16 no. towns in DHBVN.
- Data Centre completed and commissioned at Hisar.
- Disaster Recovery Centre completed at Panchkula.
- Customer Care Center has been commissioned in Gurgaon for both UHBVN & DHBVN.
- 27442 Nos. DT meters have been installed out of total 34962 Nos. in UHBVN & DHBVN.
- Consumer indexing is completed in 34 towns out of 36 towns.
- Asset Mapping is completed in all towns.
- Total 36 no. towns rolled out in UH & DH and 23 towns, have been declared “GO LIVE”.

R-APDRP PART-B

Following areas have been covered under RAPDRP-B;

1. New/ Augmentation of 11kV lines, DTs, LT lines



2. Erection of 11kV lines with AB cables
3. Replacement and relocation of consumer meters
4. Replacement of iron poles
5. Supply and installation of DT meters with modems
6. Installation of feeder pillar boxes

Highlights of R-APDRP, Part-B in the state of Haryana are as under;

1. The project was sanctioned in Sept'2013 at a cost of Rs. 1322 Cr. for both UHBVN and DHBVN. (Rs 854.90 Crores for UHBVN & Rs 467.68 Crores for DHBVN)
2. The project is to be completed in 3 years from the date of sanction i.e. up to Sept'2016. A request has been made to MoP, GoI for extension of timelines by another one year which is under consideration.
3. The DPRs have been reviewed after taking into account of the improvement works already done by UHBVN and DHBVN.

R-APDRP Part-B implementation status

In UHBVN, tender was floated at end of November, 2014 for 7 no. Packages. The tenders have been opened on 15.01.2015 against 6 no. Packages. No tender has been received against 7th package for Rohtak, Bahadurgarh and Jhajjar towns. The due date of opening of tender was extended up to 30.01.2015. Again no tender has been received and due date of tender is again extended up to 23.02.2015. The technical evaluation of tenders has been completed, price bids have been opened and the work is likely to be awarded in May 2015. The work will be completed in 24 months thereafter. NIT for 33kV works is under process. The extension for completion of the project has already been sought from GoI up to 17.10.2017.

NIT with estimated cost of Rs.543 Crores for UHBVN and Rs.304.97 crores for DHBVN has already been floated.

STATUS OF RGGVY

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) was launched by Government of India during 10th plan period in 2005 for providing access to electricity for all rural households in the country. The scheme has been subsumed in newly launched Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) in Dec 2014.

Under this scheme, 90% grant was provided for electrification of un-electrified Households, intensification of partially electrified households and free electricity connections to BPL households in the country.

As all the villages were already electrified before launch of RGGVY, the scheme was approved for intensification of 5,762 partially electrified villages and free electricity connections to 2.2 Lakh BPL households at an estimated cost of Rs. 172.99 Crores. Till date, about 90% works have been completed and Rs 156.27 Crores has already been released to the state of Haryana. The remaining works are expected to be completed by December' 2015.

"Mhara Gaon Jagmag Gaon" Scheme

A scheme named "Mhara Gaon Jagmag Gaon" is being launched for the villages having less AT&C losses. Under this scheme, the villages having better Billing and collection efficiency will be provided increased hours of supply. Basic features of the scheme is elaborated under sub heading **"Reduction in AT&C Losses"** (refer page no. 36)

CAPEX PLAN OF DISTRIBUTION COMPANIES

UHBVN & DHBVN plan its CAPEX keeping in view of the load growth, reduction in AT&C losses and reliability of power to provide 24x7 power to all in the state. While preparing the distribution requirement, the norms followed by Discoms are given at Annexure-XI-A.



Accordingly, the distribution requirement has been prepared keeping in view the present rotational cuts, running of Agriculture Pumps into two groups and pending power connections, etc. As well as keeping in view of the aim of joint initiative of Govt. of India, Ministry of Power and of GoH for 24 x 7 PFA (Power For All - except AP consumers).

With regard to the creation of new/augmentation of sub-stations, a detailed study was made in consultation with HVPN in the integrated planning committee consisting of officers of both utilities from field as well as from planning wing.

The approved sub-stations under Capex Plan of UHBVN & DHBVN is shown in the table below:

Table-7.2

Sl. No.	Description	FY 2015-16		FY 2016-17		FY 2017-18		Total	
		No	MVA	No	MVA	No	MVA	No	MVA
1	132/11 KV								
	New								
	Augmentation	2	40					2	40
2	66/11 KV								
	New	14	585.5	3	158	7	441	24	1184.5
	Augmentation	40	625.5	16	284.5	30	425	86	1335
3	33/11 kV level								
a	UHBVN								
i	New	29	374.8	37	427.5	42	637.5	108	1439.8
ii	Augmentation	34	240.8	24	209.9	88	622.8	146	1073.5
b	DHBVN								
i	New	15	200	68	752.5	78	882.5	161	1835
ii	Augmentation	54	252.5	20	100.9	35	266.8	109	620.2
Total :		188	2319.1	168	1933.3	280	3275.6	1508	25492

Source: State Power Utilities

An exercise was made to prepare Sub-Division wise CAPEX keeping in view of load growth, reduction in AT&C losses, power reliability, present rotational cuts, running of Agriculture Pumps in two groups, pending power connections etc.

The CAPEX plan up to FY 2017-18 circle wise for UHBVN emerged as under:-

Table-7.3

Sl. No.	Name of Circle	Total Capex (in Rs Cr)
1	Rohtak	429.34
2	Sonepat	620.44
3	Panipat	545.53
4	Jhajjar	285.95
5	Kaithal	378.88
6	Kurukshetra	403.76
7	Karnal	949.24
8	Yamunanagar	702.92
9	Ambala	348.52
TOTAL		4664.58

The CAPEX plan up to FY 2016-17, circle wise, for DHBVN emerged as under

Table-7.4

Sl No	Name of Circle	Total Capex (in Rs Cr)
1	Bhiwani	336.96
2	Hisar	552.61
3	Sirsa	310.67
4	Jind	271.38
5	Rewari	184.49
6	Narnaul	215.47
7	Palwal	240.9
8	Faridabad	315.36
9	Gurgaon	319.93
TOTAL :		2747.77

Detail Capex plan is shown in Annexure-XI-A.

It may be seen that there is CAPEX requirement of **Rs. 4664.58 Crores** over a period of three years i.e. up-to FY 2017-18 for UHBVN & Rs 2747.77 Crores for two years up to FY 2016-17 for DHBVN. However, the approval of HERC is also required to carry out all activities planned under CAPEX viz-a-viz to make 24 x 7 PFA a successful mission.



Proposed Government of India Schemes-

Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

Government of India launched Deendayal Upadhyay Gram Jyoti Yojana (DDUGJY) on 3rd December, 2014 for;

- (i) Separation of agriculture and non-agriculture feeders facilitating judicious restoring of supply to agricultural & non-agriculture consumers in the rural areas.
- (ii) Strengthening and augmentation of sub-transmission & distribution infrastructure in rural areas, including metering of distribution transformers/feeders/consumers.
- (iii) Rural electrification for completion of the targets laid down under RGGVY for 12th and 13th Plans by carrying forward the approved outlay for RGGVY to DDUGJY.

The components at (i) and (ii) of the above schemes will have an estimated outlay of Rs. 43033 Crores including a budgetary support of Rs. 33453 Crores from Government of India during the entire implementation period.

As already mentioned, the scheme of RGGVY as approved by CCEA for continuation in 12th and 13th Plans has been subsumed in this scheme as a separate rural electrification component for which CCEA has already approved the scheme cost of Rs. 39275 Crores including a budgetary support of Rs. 35447 Crores. This outlay will be carried forward to the new scheme of DDUGJY in addition to the outlay of Rs.43033 Crores. REC is the nodal agency for the operationalization of DDUGJY in the Country.

Integrated Power Development Scheme (IPDS)

The Central Government has sanctioned "Integrated Power Development Scheme" (IPDS) on 3rd December, 2014 for urban area for:

- (i) Strengthening of sub-transmission and distribution networks in the urban areas.

- (ii) Metering of distribution transformer/ feeders/ consumers in the urban areas.

- (iii) IT enablement of distribution sector and strengthening of distribution network for completion of the targets laid down under R-APDRP for 12th and 13th Plans by carrying forward the approved outlay for R-APDRP to IPDS.

The components at (i) and (ii) above will have an estimated outlay of Rs. 32,612 Crores including a budgetary support of Rs. 25,354 Crores from Government of India during the entire implementation period.

The scheme of R-APDRP as approved by CCEA for continuation in 12th and 13th Plans has been subsumed in this scheme as a separate component relating to IT enablement of distribution sector and strengthening of distribution network [component (iii) above] for which CCEA has already approved the scheme cost of Rs. 44,011 Crores including a budgetary support of Rs. 22,727 Crores. This outlay will be carried forward to the new scheme of IPDS in addition to the outlay indicated above. PFC is the nodal agency for the operationalization of IPDS in the country.

DPRs for recently launched schemes IPDS (for urban areas) and DDUGJY (for rural areas) have been submitted by Govt. of Haryana to the PFC/REC, NIT to appoint Project Management Agency against DDUGJY and IPDS in respect of both the utilities UHBVN & DHBVN has been floated and is in the process of finalization.

With the launch of DDUGJY and IPDS schemes by Govt. of India, and since there was a provision of grant up to 75%, the Nigam initially decided to go first with DDUGJY and IPDS, but, since the fund allocation under DDUGJY and IPDS is not yet declared by Ministry of Power, the Nigam has decided to go ahead with JICA loan project.

UHBVN & DHBVN undertakes to carry out creation of new 33kV Sub-stations and augmentation of existing 33kV Sub-stations approved up to FY 2017-18 against the loan from REC and JICA.



Perspective of 24x7 PFA in respect of proposed Smart City at Gurgaon

Due to serious ROW issues in the old Gurgaon city area i.e. Sec-1-57, laying of additional 11 kV system for infrastructure strengthening is almost impossible. Also, it is not possible for 11 kV network to sustain the future load growth of Gurgaon town. It has been decided that no investment should be made on conversion of existing 11 kV network to underground, rather a system should be laid on 33 kV voltage level to resolve ROW problem for all times to come. This work shall be carried out in phased manner giving priority to highest revenue earning area. For this, area under DLF Sub-Division DHBVN, Gurgaon has been identified in the first phase

for which the proposed infrastructure shall incur an approximate expenditure of Rs. 1200 Cr. which shall include 33 kV underground cabling work, complete underground 11 kV & LT network, replacement of all 11/0.4 kV distribution transformers with 33/0.4 kV distribution transformers, SCADA & OMS, AMI & provision of RMUs & RTUs for ensuring 24x7 power supply.

Loan Assistance from JICA FOR UHBVN & DHBVN

Approved project under JICA Loan assistance amounting Rs 827 Crores & Rs. 629.41 Crores for UHBVN & DHBVN respectively is as under:

Table-7.5

Sl. No.	Name of scheme (Period of Execution FY-2015-16 to FY- 2016-17)	Qty. as per NAD (in Nos.) UHBVN	Cost as per NAD (Rs. in Cr.) UHBVN	Qty. as per NAD (in Nos.) DHBVN	Cost as per NAD (Rs. in Cr.) DHBVN
1	Implementation of AMI/AMR of all consumers between 10-50 kW (AMI 10-20 kW)	63433	87.10	0	0.0
2 (i)	Procurement of single phase meters for replacement of defective and release of new connections in numbers	600000	58.04	790000	76.60
2 (ii)	Procurement of three phase meters for replacement of defective and release of new connections in numbers	140000	29.23	175000	36.58
2 (iii)	Procurement of Power T/F 10 MVA and allied equipments such as 33 kV CTS (current transformers), 33 kV & 11 kV VCBs (Vacuum Circuit Breakers), 33 kV Control & relay Panels etc.	30	26.84	20	19.91
3 (i)	Setting up of a new testing lab for materials, i.e cable, conductors, transformer oil, distribution transformers etc.(Karnal)	1	2.07	1	2.07
3 (ii)	Revamping of existing M&T (Meter Testing) labs at (Kaithal, Ambala (Dkt), Yamuna Nagar, Karnal & Rohtak)	5	10.71	5	1.36
4 (i) & (ii)	Details of new 33 kV substations & Augmentation of existing sub-stations	25+23	128.10	50+51	261.53
4 (iii)	11 kV feeders to be bifurcated	646	108.51	337	51.56
5	Relocation of energy meters of DS & NDS consumers outside their premises	86522	376.40	44591	179.80

Note: The above projects under JICA are under revision

Total cost for the above schemes are Rs 827.00 Crores and Rs 629.41 Crores for UHBVN and DHBVN respectively.



DISTRIBUTION REQUIREMENT FOR RURAL AREAS

To provide 24x7 power supply in the rural areas, Govt. of Haryana has finalized the following requirements for augmentation of rural infrastructure in the state;

Table-7.6

Sl. No.	Item of work	unit	UHBVN	DHBVN
A. Feeder Separation				
1	33 KV Feeder	kms	0	83.5
2	11 KV Feeder	kms	0	451.67
3	LT Line	kms	0	397.65
4	Distribution Transformer	MVA	0	62.11
B. Strengthening of Sub-Transmission and Distribution Network				
1	33/11KV or 66/11KV S/S			
	New substation	No	48	
	New substation	MVA	670	255.00
	Additional Transformer	MVA	0	206.80
	Augmentation Enhancement	No	109	
	Augmentation Enhancement	MVA	783.4	36.30
	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations	Nos	0	
2	33 KV feeders			
	New	kms	152.55	0
	Augmentation	kms	241.8	1159.40
3	New 11 KV feeders-			
	New	kms	649	637.09
	Augmentation	kms	0	1337.21
	Distribution Transformer-New	Nos	5833	3789
4	Distribution Transformer-New	MVA	438.465	318.02
5	Distribution Transformer-Augmentation	Nos	4543	0
	Distribution Transformer-Augmentation	MVA	175.258	0
5	Distribution Transformer-R&M	Nos	0	37570
6	LT Line			
	New	kms	2607.85	1312.35
	Augmentation	kms	4171.99	2036.90
7	Capacitor Bank	MVAR	0	240.80
8	Aerial Bunched Cables			
a	HT	kms	4586.14	505.83
b	LT	kms		0
9	Underground Cables	kms	0	0
10	Providing Additional LT Poles	Nos	8900	0
C. Metering				
1	Feeder	Nos	0	0
2	Distribution Transformer	Nos	0	0
3	Consumer meter			0
a	Single	Nos	475000	500000
b	phase	Nos		15000
4	Material required for Re-allocation of Energy Meter Outside the consumer premises	Nos	749996	0

Total cost for the above schemes are Rs 983.85 Crores and Rs 899.52 Crores for UHBVN and DHBVN respectively.



DISTRIBUTION REQUIREMENT FOR URBAN AREAS

To provide 24x7 power supply in the Urban areas, Govt of Haryana has finalized the following requirement for augmentation of urban infrastructure in the state;

Table-7.7

Sl. No.	Item of work	Unit	UHBVN	DHBVN
A. Feeder Separation				
1	33 KV Feeder	km	0	
2	11 KV Feeder	km	0	
3	LT Line	km	0	
4	Distribution Transformer	Nos	0	
5	33 KV Feeder	km	0	
B. Strengthening of Sub-Transmission and Distribution Network				
1	33/11KV or 66/11KV S/S			
	New substation	MVA	237.5	122.9
	Additional Transformer	MVA	0	
	Augmentation Enhancement	MVA	394.5	
	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations (details of Substations & works to be provided in DPR)	Nos	0	63
2	33 KV feeders			
	New	km	54.5	416.5
	Augmentation	km	0	
3	New 11 KV feeders-			
	New	km	1083.1	1638.6
	Augmentation	km	278.78	
4	Distribution Transformer-New	MVA	187.058	261.41
5	Distribution Transformer-R&M	Nos	0	7827
	Distribution Transformer-Augmentation	MVA	76.013	193
6	LT Line			
	New	km	675	2284.05
	Augmentation	km	262.98	
7	Capacitor Bank	MVAR	13.9	50.4
8	Aerial Bunched Cables (HT/LT)	km	699.14	658.34
9	Underground Cables	km	50.4	298.82
10	HVDS	Nos	0	555
11	Roof top solar projects	Nos	0	297
C. Metering				
1	Feeder	Nos	7	27625
2	Distribution Transformer	Nos	0	
3	Consumer	Nos	0	
4	Prepaid Meters	Nos	1003	1673
5	Installation and shifting of energy meter with electronic meter	Nos	96000	96566.65
6	AMI, Smart Meters	Nos.	0	40000
7	11kV switching substation	Nos.	0	44.

Total cost for the above schemes are Rs 409.86 Crores and Rs 703.87 Crores for UHBVN and DHBVN respectively.

Note : Complete detailed scope of work in Rural & urban areas, district wise, is shown in Annexure-VIII to XI.

Govt of Haryana would seek the funding for Rural and Urban areas under on-going DDUGJY and IPDS schemes of GOI. In case, whole amount was not sanctioned under DDUGJY/IPDS schemes as per Policies/ guidelines of the schemes, Govt. of Haryana would arrange the balance amount from it's own sources.



IT INITIATIVE TAKEN BY UHBVN & DHBVN

IT enablement of town with population more than 5000 is not covered under R-APDRP scheme. The same is covered under IPDS scheme. The cost of the same is undertaken in the IPDS scheme.

For domestic category, connections are generally released within the timeline except for cases with non-submission of necessary modalities such as Documents, payment of Demand Notice, Test reports, etc. by the consumers.

Following are the technology up-gradation / renovation & modernization schemes being adopted / proposed to be adopted;

1. AMR technology implementation for HT consumers (4300 nos. approx for UHBVN)

2. AMR metering to be carried out for consumers having load more than 20kW. RFP Preparation is in progress for the project.
3. Revamping of meters and material testing labs (5 Nos. for UHBVN & DHBVN each).
4. ERP implementation for DHBVN.
5. RAPDRP, Part-A scheme.
6. IT being introduced to manage inventory and accounting.
7. Meter reading, bill preparation and revenue collection system being upgraded.

Reduction in AT&C Losses

The projected AT & C losses are summarized below in Table 7.8:

Table-7.8

Sl. No.	Description	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
1	Intrastate transmission losses (%)	2.48	2.46	2.44	2.42
2	Distribution Losses (%)	22.2	20.4	18.8	17.1

DISCOMs have envisaged following measures for bringing down AT&C losses;

1. Government of Haryana has launched “Mhara Gaon Jagmag Gaon” scheme on 01.07.2015 to reduce AT&C losses in rural domestic sector. Under this scheme, the following steps have been envisaged:
 - a) Daily supply to lowest loss feeders (one in every assembly constituency) shall be increased from 12 hrs to 15 hrs with immediate effect and increasing it with further reduction of losses.
 - b) Daily supply shall be increased from 15 hrs to 18 hrs when all the naked LT conductors are fully replaced with AB cables as per site requirement and the meters of all the connected households are shifted outside consumer premises.
 - c) For measuring the power supplied to the village, meters shall be installed on all the points from which 11 kV lines goes into the

village. After allowing for the specified quantum of technical losses below 20 %, if the village pay bills to the extent of 90 % of power supplied, their daily electricity supply shall be increased from 18 hrs to 21 hrs.

- d) If the defaulting amount of the feeder remains less than 10%, 24 hours supply will be provided.
- e) Respective Discoms along with Senior officers of the District Administration will hold the Bijli Panchayat in all the villages connected to the selected feeders. The following activities are to be performed on the day on Bijli Panchayat:
 - Making villages aware of problems and hearing their grievances.
 - On spot settlements of Bill dispute and release of new connections.
 - On spot extension of load regularization.



2. Installation of meters outside the consumer premises.
3. Identification of loss prone area by tagging of consumers with DTs and feeders for energy accounting.
4. Junior Engineer to be designated as Feeder Manager for feeder wise monitoring, O&M and Revenue work for decentralized accountability.
5. Suitable Incentive /disincentive schemes for rewarding/penalising field officer after analyzing the area with low/high loss level.
6. Large scale use of LT AB Cable both for new LT line and R&M work in theft prone and congested/slum areas. Implementation of above in slum area may need support from local administration/public representative.
7. Replacement of defective /electro mechanical meters with static meters.
8. Automatic meter reading (AMR) to be implemented on all high end consumers. The above is already being implemented for HT industrial consumers above 50 kW in UHBVN. For consumers above 10kW in DHBVN, Advanced Metering Infrastructure (AMI) is being implemented.
9. Nigam is pursuing feeder wise (11 kV and independent feeders) energy audit practice in areas under its jurisdiction. The Nigam is also carrying out energy audit of mobile towers and is constantly checking exception reports. Third party verification of technical & financial data on sample basis shall be carried out.
10. **Arrear recovery drives:** The Nigam also undertakes special drives to recover arrears from the consumers. Recently an arrear recovery plan has also been issued to field offices with allocation of fixed timeline and responsibility.
11. Improvement in HT/LT ratio.
12. Formation of Special Task Force (STF) & organising effective raid against theft and unauthorised use of electricity on regular basis with the support of local administration. Special police stations for dealing theft cases related to power & irrigation have been set up.
13. Management of Revenue in rural areas through Rural Revenue Franchisee.
14. Close monitoring of Revenue functioning at different level on weekly basis at Director / GM (Commercial) level & monthly revenue meeting with all concerned field officers at MD level.
15. Implementation of IT enabled services for power consumers. This has great potential in reducing losses and providing consumer friendly services.

Improving Consumer Convenience & Revamping Maintenance Philosophy

Central complaint centre for taking consumer complaints is formed under APDRP, Part-A, at Gurgaon. The complaints of the consumers are directly transferred to the concerned O&M team for resolution. The monitoring and reviewing of the complaints is done at head Office Level. Consumer can also register their complaints through SMS and Emails.

Portal for online Application for new connection is also in place for ease of the consumer.

Outsourcing of O&M works for the HT/LT network is being looked into. Various meeting have been held with progressive agencies for carrying out Operation & Maintenance Activities under supervision of DISCOM officials.

Presently DISCOMs are engaged only in Break Down repair work of the various equipments. In order to increase reliability of the system, DISCOMs should look for implementing system driven preventive maintenance system. Power



Transformers, Distribution Transformers, Circuit Breakers, etc. can be checked periodically for identification of any faults and correction thereof. Further, DISCOMs should have defined roadmap to adapt Predictive Maintenance as well.

For improving further and make the process more transparent state regulator can undertake Customer Satisfaction Survey through some independent agency.

Customer segmentation in terms of differentiated service delivery can also be prescribed by state regulator in the next phase.

Performance Monitoring Mechanism

Circle, Division and Sub-division performance with respect to T&D losses (i.e. Billing Efficiency and collection efficiency) to be monitored and reviewed on monthly basis.

In order to implement appropriate reform measures and meet the objective, baseline parameters needs to be verified and established, and hence it is proposed that a Third Party Audit should be carried out for establishing the baseline parameters for the KPI indicated below and thereafter following performance parameters needs to be monitored at the DISCOM Corporate level.

Table-7.9

Corporate Strategic Objectives	KPI	UOM
Maximize Rate of Return	PAT	Rs Crores
	No of households to be electrified	Nos in Lakhs
	CAPEX	Rs. Crores
Sustain AT&C loss level & achieve further reduction	AT&C Losses	%
	Collection Efficiency	%
	Billing Efficiency	%
Monitoring Distribution Cost	Establishment Cost	Rs. Crores
	R&M Cost	Rs. Crores
	A&G Cost	Rs. Crores
	Power Purchase Cost	Rs./unit
Enhancing Customer Satisfaction	CSI Overall	Index
	Total Consumer Complaints/ '000 consumers	Nos.
	New initiatives to enhance customer convenience	Nos.
	Addition in regards to Payment Avenues	Nos.
	PA Compliance Index	Index
Operational Efficiency	No. of customers served /employee	Ratio
System Reliability	SAIDI	Hrs
	SAIFI	nos.
	DTR Failure Rate	%
	PADCI (Project Av. Duration Closure Index)	Months
	No of Accidents (Fatal/ Non Fatal)	Nos

Connecting the Unconnected Households

There are 2,85,201 numbers un-electrified households in the state and all are in rural areas. GoH made a plan to electrify all such households in a phased manner in next 4 years as shown in table below by adopting following means:

- Electrification from nearby existing agriculture feeder with the use of Pilot Advanced Transformers (PAT) to cater the minimum requirement of electricity of the consumers.
- Extending the existing rural feeder to the consumer end where agriculture feeder does not exist.



Table-7.10

New H/H	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total	Left out
RURAL-285201	71300	71300	71300	71301	285201	0
URBAN-0	0	0	0	0	0	0

- Electrification through Decentralized Distributed Generation (DDG) under DDUGJY/ MNRE schemes

This scheme under DDUGJY is for those Habitations/Dhanies where grid connectivity is either not feasible or not cost effective. The distributive generation can be from conventional or renewable

sources such as Biomass, Bio fuels, Biogas, Mini Hydro, Solar etc. Govt. of Haryana may identify the remote habitations, if any, which are not possible to be electrified through the grid supply and may submit their DPRs under DDG scheme of DDUGJY or the habitations may be electrified under various MNRE schemes. The details of MNRE schemes are at Annexure-XI.

ASSESSMENT OF ADEQUACY OF DISTRIBUTION SYSTEM

Table-7.11

Sl. No	Description	Units	Existing	Capacity addition up to FY 2018-19	Total
1	132/11,66/11, 33/11 & 33/3.3 kV				
a	NEW PSS	Nos.	872	293	1165
b	Augmentation of PSS	Nos.		343	343
2	Total 132/11 ,66/11 ,33/11 & 33/3.3 kV PSS Capacity including Augmentation	MVA	17964	7496	25460
3	11/0.415kV NEW Distribution Transformer Capacity	Nos.	487303	101509	588812
4	Total 11/0.415kV Distribution Transformer Capacity including Augmentation	MVA	22304	6632	28936

From the above table it is evident that the transformation capacity at 132/11 kV, 66/11kV, 33/11kV & 33/3.3 kV levels is projected to grow from 17,964 MVA in FY2014-15 to 25,460 MVA in FY2018-19.

The Projected peak demand of the state, including demand of large industrial consumers at 33 kV level, has been Projected at 12,112 MW in FY 2018-19. The energy billed for HT (Industrial) (33 kV & 11 kV bulk consumers) for FY2014-5 is 8030 MU.

From the above, load of 33 kV consumer in FY2018-19 is about 500 MW.

Correspondingly the demand met at 11 kV and below comes to 11,612 MW (12112-500) which corresponds to 12,902 MVA considering a power factor of 0.9. Against this peak requirement, the installed capacity at 132/11kV, 66/11kV, 33/11kV & 33/3.3 kV levels in FY 2018-19 is projected at 25,460 MVA. This translates into an average loading of 51 % on 132/11kV, 66/11kV, 33/11kV & 33/3.3 kV transformers under peak demand conditions.

From the aforesaid it can be concluded that the overall substation capacity planned for FY 2018-19 would be adequate for meeting the projected demand.



The transformation capacity at 11/0.415 kV level is projected to grow from 22,304 MVA in FY2014-15 to 28,936 MVA in FY 2018-19.

Similarly the load of 11 kV consumers in FY2018-19 is about 550 MW.

Correspondingly the demand met at 11 kV and below comes to 11,062 MW (11612-550) which corresponds to 12,291 MVA considering a power factor of 0.9. Against this peak requirement, the installed capacity 11/0.415kV level in FY 2018-19 is projected at 28,936 MVA.

This translates to an average loading of 42% on 11/0.415 kV transformers under peak demand conditions.

From the aforesaid it can be concluded that Distribution transformation capacity planned at DT level for FY 2018-19 would be adequate for meeting the projected demand.

Fund Requirement

The fund requirement for the GoI proposed scheme including other schemes.

Table-7.12

(In Rs Crores)

	FY 2015-16	FY 2016-17	FY 2017-18	Total
UHBVN				
DDUGJY	327.95	327.95	327.95	983.85
IPDS	136.62	136.62	136.62	409.86
JICA	275.67	275.67	275.66	827.00
R-APDRP	171.97	171.97	171.96	515.90
Balance to be proposed to GoI/State	642.67	642.67	642.66	1928.00
Total:	1554.88	1554.88	1554.85	4664.61
DHBVN				
DDUGJY	179.9	359.81	359.81	899.52
IPDS	140.77	281.55	281.55	703.87
SMART CITY SCHEME		800	400	1200.00
JICA	186.11	186.11	257.19	629.41
IBRD	110.18	72.23	0	182.41
R-APDRP, PART-A, including SCADA Part-A	69.13	7.18	0	76.31
R-APDRP, PART-B including SCADA Part-B	200.01	388.27	0	588.28
MGGBY	16.39	0	0	16.39
RGGVY	17.02	0	0	17.02
Balance to be proposed to GoI/State	386.66	146.43	442.81	975.90
Total	1306.17	2241.58	1741.36	5289.11

ACTION POINT-FOR STATE GOVERNMENT

1. All un-connected households to be electrified by adopting various means as described earlier under sub heading **"Connecting the Unconnected Households"** (refer page no. 39).
2. To meet the agreed trajectory of AT & C losses through initiatives as described earlier

under sub heading **"Reduction in AT&C losses"** (refer page no. 36).

3. To introduce modern technologies, to monitor reliable & quality supply, like sub-station automation, providing adequate communication infrastructure, GIS, Reliability, Centralized Network Analysis and Planning tools, SAP driven ERP systems, DMS (Distribution Management Systems), OMS (Outage Management System), etc.



Some of the above measures may be implemented for industrial and other high end consumers giving high Rate of Return (RoR).

4. State would take necessary steps to meet the Performance Standards specified by HERC. Proper mechanism of monitoring Key Performance Index (KPI) as described under sub heading **“Performance Monitoring Mechanism”** (refer page no. 38).

5. To make arrangement of balance funds after approval of ongoing schemes of GoI like DDUGJY and IPDS.

6. **Revision of tariff & recovery of bills:**

70 to 80 % domestic consumers in rural area are paying much less than the cost of supply. Hence, the AT & C losses will increase further if the objective of 24X7 PFA is met. There is no provision to recover the cost of supply fully. In order to address this, the following shall be taken care:

- The entire cost component shall be considered while arriving at actual cost of supply. Proper scientific cost calculation method to be adopted for computation of various cost components.
- Timely Tariff petition to HERC shall be ensured.
- Experienced & knowledgeable consultant may be engaged in order to carry out above activity.

7. **Reducing interest burden:**

DISCOMs are operationally in profit (567 Crores in FY 2014-15), but losing cash (3500 Crores in FY 2014-15) due to high interest and repayment burden. To reduce interest burden to Discoms short term loan (interest rate 12%) may be substituted by State Govt. Bonds (interest rate 8%) which may need amendment of FRBM limits. Further, Moratorium for repayment of loans as per FRP package may also be extended by minimum 1.5 years.

8. Up gradation of Manpower & System:

At present there are large numbers of vacancies (49%) in the power utilities and manpower at critical levels has been outsourced. This creates problem in decision making to operate the system. To overcome the above, the following actions need to be taken:

- Actions for recruiting regular manpower to manage substations and financial accounting in the sub-divisions.
- Experts need to be recruited for managing Power Procurement & Management Cell who shall be capable to take commercial decisions. The experts shall be capable to handle predictive demand model and to analyse its results. They should also be capable to plan, schedule and monitor the load based on the outcome of the model.
- Implementation of IT to manage inventory and accounting.
- Meter reading, Bill preparation & revenue collection activities may be outsourced.

GOI Intervention

- To approve the whole amount of the DPRs submitted under “Deendayal Upadhaya Gram Jyoti Yojana **“(DDUGJY)** with estimated cost Rs 2753.64 crores (Rs 1883.37 Crores as per NAD) and DPRs under Integrated Power Development scheme **(IPDS)** with estimated cost of Rs 1290.67 Crores (Rs 1113.73 Crores as per NAD) to ensure reliable and secure 24X 7 quality power supply to all.
- GoI may formulate mechanism for effective and timely implementation of the tariff policies, thereby lessening the gap between cost of supply and electricity tariff passed on to the consumers. This will reduce the financial burden on the state distribution utilities.



CHAPTER – 8 : RENEWABLE ENERGY STATUS AND PLAN

Renewable energy is increasingly becoming an important source of the energy mix –meeting the twin objectives of meeting energy security and clean energy considerations. Haryana has good potential for promotion and development of renewable and non conventional energy projects, particularly Solar and Biomass Projects. Good explorable options and potential exists for power generation from irrigation canal drops, solar including solar PV on canal top, biomass cogeneration etc. State has already issued liberal policies for promotion of renewable energy generation.

Government of Haryana is keen to tap renewable power potential of the state, particularly solar and biomass power potential, to meet the growing demand of power in an environmental friendly and sustainable manner. Gurgaon & Faridabad has been declared as solar city. The areas of studies are:

- Renewable energy plan especially for Bio mass based power projects.

- Grid connected and off grid Roof Top Solar scheme.
- Solar water pumping scheme particularly for agricultural consumers.
- Action plan of the state.
- Fund Requirements.
- GoI/ State Government Interventions

Grid Connected Renewable Energy:

The total Renewable Energy (RE) installed capacity as on 31.03.15 is 271.59 MW out of which developers have signed PPA with Haryana Power Purchase Company (HPCC) for 154.4 MW. The balance power is used for captive purpose by the respective generating company. Category wise break up of present installed capacity and potential of generating power from Renewable Energy Sources is given in Table-8.1.

Table 8.1

Source	Present Installed Capacity (MW) already Commissioned	MW for which PPA signed with HPCC	Under Execution (MW)	Potential (MW) As per MNRE
Solar PV MW scale	18.8	12.8		4560++
NON SOLAR:				
Bagasse based cogeneration	77	36	25	350
Biomass based cogeneration	55.31		7.45	1333
Biomass based power generation	39.4	32.4		
Biomass gasification	3.74	-		
Bio gas based power generation	4.14	-		
Small Hydro	73.2**	73.2	10.90	110
Waste to Energy	---			24
Wind	---			93 (Sufficient specifically in the Morni hill and Aravelli Area)
Total	271.59	154.4	43.35	6470

NOTE:

- a) ++ As per National Institute of Solar Energy (NISE) estimate considering 3% of waste land in the state to be used for solar power.
- b) ** 0.3 MW Kakroi SHP at Sonapat has already phased out by HPGCL and not included in the present installed capacity. Detailed list of commissioned renewable Energy Projects are provided in enclosed Annexure-XII.



Policy in place:

Various 'New and Renewable Energy Policies' are already in place in Haryana. The policies and initiatives adopted by Govt. of Haryana (GOH) are as described below:

- a. Gazette notification no 22/52/2005-5 dated 3rd September, 2014, for efficient use of energy and its conservation in the State of Haryana, the installation of Solar Photovoltaic Power Plant for certain category of buildings/areas (capacity ranges from 3% to 5%) made mandatory.
- b. Haryana Government vide Gazette notification no 19/14/14-5 dated 4th September, 2014 has notified Haryana Solar Power Policy 2014 to promote the generation of power from solar energy.

- c. Regulations for Rooftop Solar Photovoltaic systems based on net metering concept framed by HERC and adopted by Nigam.

Government of Haryana Initiatives and Plan

Based on the HERC (Terms & Conditions for determination of tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulation, 2010 (3rd Amendment) Regulations, 2014 issued in July 2014, the Commission has set a total Renewable Purchase Obligation (RPO) target as 4.5% of energy consumption and solar RPO target as 1.5% of energy consumption till FY 2018-19. The Commission has set a total RPO target up to FY 2018-19 not less than the quantum of renewable energy as indicated in the table below:-

Table 8.2

Financial Year	Total RPO (As a Percentage of Total Consumption)	Solar RPO (as a percentage of total consumption)
FY 2015-16	3.50	0.75
FY 2016-17	3.75	1.00
FY 2017-18	4.00	1.25
FY 2018-19	4.50	1.50

The following steps have been taken in order to meet the RPO target:

Solar RPO :

- HPPC has signed Power Sale Agreement (PSA) with Solar Energy Corporation of India (SECI) on 22.8.2014 for purchase of 120 MW of solar power @ Rs. 5.5/kWh for 25 years. Considering 19% PLF, HPPC will get 199.53 MUs per annum during FY 2015-16 and thereafter.
- In addition to above, HPPC has allotted projects of 25 MW of solar power to IPPs @ Rs.6.44/kWh FY 2014-15 through competitive bidding. With this power available, HPPC will get 41.6 MUs of solar power per annum during FY 2016-17 and thereafter.

- HPPC has floated tender on 26.5.2015 for purchase solar power of 150 MW through competitive bidding.
- HPPC has given consent to NTPC for purchase of 150 MW solar power bundled with 75 MW thermal power under Solar bundling scheme under JNNISM.
- HPGCL has planned to develop total 72 MW solar power at three (3) locations by FY 2018-19. Considering 19% PLF, HPPC will get 33 MUs per annum by FY 2016-17, 70MUs per annum by FY2017-18 and 120MUs per annum by FY 2018-19 and thereafter.

Thus, against the commutative shortfall of 143 MUs from the FY 2011-12 to FY 2014-15, HPPC will be able to meet the RPO target if these projects are installed.



Non-Solar RPO

- There is a cumulative shortfall of 2198 MU up to the year 2014-15 for non-solar RPO.
- HPPC has purchased power from Himachal Pradesh under short term tender. With this

power available, HPPC would approximately get 650 MUs in FY 2015-16

Further, HPPC has signed PPA with following Renewable Energy Developers.

Table-8.3

List of Envisaged RNES Projects

Name of the Project	Capacity (MW)	Solar / Wind	Owner ship Private/ state owned	Likely year of Commissioning / COD
Naraingarh Sugar Mill, Naraingarh, Dist. Ambala	25	Bagasse	Private	COD Nov 2015
GEMCO Biomass in Vill. Dinod, Dist. Bhiwani	7	Biomass	Private	8 MW running and COD of 7MW by April 2016.
Total	32			

Year Wise proposed capacity addition plan through renewable (grid interactive) is as follows:

Table-8.4

Particulars	Year wise likely capacity addition plan (cumulative) (MW)			
	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Solar PV (Through NIT route)	-	175	175	175
Solar PV (Through PPA)	12.8	12.8	12.8	12.8
Solar PV through NTPC		150	150	150
SECI (Through PPA)	120	120	120	120
Solar by HPGCL		20	42	72
Small Hydro by HPGCL & IPPs	73.2	73.2	73.2	73.2
Wind	----	----	----	----
Bagasse	61	61	61	61
Bio Mass	39.4	39.4	39.4	39.4
TOTAL	306.4	651.4	673.4	703.4

Action Plan of the State for Grid Interactive NCE/RNES Plants:

The state has to ensure

completion of renewable generating capacities in the State of Haryana as per the following roll out plan:

Table-8.5

Particulars	Year wise capacity addition plan (MW)			
	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Solar PV (Through NIT route)	0	175	0	0
SECI (Through PPA)	120	0	0	0
Solar PV through NTPC	0	150	0	0
Solar by HPGCL	0	20	22	30
Small hydro by HPGCL	0	0	0	0
Bagasse	25	0	0	0
Bio Mass	7	0	0	0
TOTAL	152	345	22	30



Fund Requirement

Total fund requirement (year wise) for various projects is given here under:

Table-8.6

Particulars	Year wise Fund Requirement for RNES (Rs. in Crores)			
	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Solar PV (Through NIT route)	0	1225	0	0
SECI (Through PPA)	840	0	0	0
Solar PV through NTPC	0	1050	0	0
Solar by HPGCL	0	140	154	210
Small Hydro by HPGCL & IPPs	0	0	0	0
Bagasse	137.5	0	0	0
Bio Mass	38.5	0	0	0
TOTAL	1016	2415	154	210

Intervention by State Government:

- GOH may submit their proposal to MNRE for VGF funding as per norms of the scheme.
- Set up single window clearances mechanism to expedite clearances of NCE projects.
- To provide solar energy generation based rebate in electricity bills for motivating consumers to install solar power plants.
- Grid connected Solar PV Power Plants on Canal Tops may be taken up by HAREDA for implementation in the state.

Intervention by GOI:

- Viability Gap Funding (VGF) as applicable for various solar projects in the state may be provided.
- Target shall be allotted in programme mode instead of project mode at the start of the financial year.
- Subsidy for development of Green Corridor from National Clean energy Fund (NCEF).

Renewable Energy Initiatives of Govt. of Haryana at Consumer Level:

Grid connected and off Grid Roof Top Solar Scheme:

HAREDA may undertake following initiatives:

- Off grid Rooftop Solar Power Plant at Govt. buildings may be implemented in the state by HAREDA (Haryana Renewable Energy Development Authority). 1KWp solar rooftop power plant at residences and commercial buildings may be also proposed to be implemented by FY 2018 -19.
- Rooftop SPV power programme may be implemented by FY 2018 -19.
- Installation of Solar Power plant at District Collectorate, Hospital & Circuit Houses of each districts of Haryana may be completed by FY 2018 -19.

Solar water Pumping Scheme

In the State of Haryana there are various pockets where the ground water level is less than 100 feet i.e. Yamuna catchment area, Canals etc. Further there is substantial scope of Solar Water Pumping System in the Poly Houses and green houses. So there shall be promotion of solar water pumping system in these areas. The target for the next five years shall be 3000 pumps per year for the capacity of 2HP to 5HP.

Solar Off-Grid Systems

It is an ongoing scheme of MNRE in which domestic lighting system (DLS) / home lighting



system (HLS- Model-III) are being provided to the Scheduled Caste (SC) beneficiaries in rural areas who have constructed their houses under IAY scheme having one solar module of 24 W, 2 LEDs each of 3 W, 1 fan of 10 W and one battery of 12V, 20Ah capacity. This scheme is having a provision of 30% subsidy from MNRE, Rs. 5000/- from GOH and balance to be borne by the beneficiary.

The Government buildings, hospitals, Public Health Centres (PHCs), Block offices in rural and semi-urban areas may be proposed to be provided with Solar Off-Grid Systems with battery support.

Proposal for above schemes would be prepared on annual basis and submitted to MNRE for approval. The projected figures of above scheme are mentioned in the below table.

Table-8.7

Details of Renewable Energy initiatives (Physical & Investment)

Sl. No.	Particulars	Unit	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total
A	Grid connected Solar Rooftops		15MW	200MW	200MW	235MW	650MW
	Investment required	Rs. Cr.	150	2000	2000	2350	6500
	Subsidy from MNRE	%	As applicable				
B	Solar off-grid systems						
i)	Solar power Plant		833 KW	1000 KW	1000 KW	1000 KW	3833KW
	Investment required	Rs. Cr.	9.58	11.5	11.5	11.5	44.08
	Assistance from MNRE	%	As applicable				
	Assistance from GOH	%	As applicable				
ii)	Solar pump systems	No.	3000	3000	3000	3000	12000
	Investment required	Rs. Cr.	120	120	120	120	480
	Assistance from MNRE	%	As applicable				
	Assistance from GOH	%	As applicable				
	Beneficiary	%	Balance Fund				
	Solar Home Lighting	NO.					
	CFL		4000	4000	4500	4500	17000
	LED		1000	1000	1200	1200	4400
	LED (IAY)		3000	3000	3400	3400	12800
	Investment required	Rs. Cr.					
	CFL		155.00	200.00	200.00	250.00	805
	LED		30.00	30.00	35.00	35.00	130
	LED (IAY)		150.00	150.00	200.00	250.00	750
	Assistance from MNRE	%					
	CFL		-				
	LED		-				
	LED (IAY)		As applicable				
	Assistance from GOH	%					
	CFL		As applicable				
	LED						
	LED (IAY)						
	Beneficiary	%					
	CFL		Balance Fund				
	LED						
	LED (IAY)						

Action Plan of the State for NCE/RNES projects at Consumer Level:

- DPRs for the above schemes to be prepared and submitted to MNRE for approval on yearly basis.

GOI INTERVENTION

- To facilitate the earlier approval of DPRs for the above schemes.

- Capital subsidy under Rashtriya Krishi Vikash Yojana for solar Pump system.
- The target shall be given on programme mode instead of project mode.

Central Financial Assistance shall be provided in the beginning of financial year.



CHAPTER – 9 : ENERGY EFFICIENCY

With increasing importance being given to low carbon growth these days, the cheapest and more affordable option to overcome the energy deficit is Demand Side Management (DSM) and implementation of energy efficiency measures in various sectors such as agriculture, municipalities, buildings, domestic, industries etc. The DSM has been traditionally seen as a means of reducing peak electricity demand. In fact, by reducing the overall load on an electricity network, DSM has various beneficial effects, including mitigating electrical system emergencies, reducing the number of blackouts and increasing system reliability. Possible benefits can also include reducing dependency on expensive imports of fuel, reducing energy cost, and reducing harmful emissions to the environment.

Finally, DSM has a major role to play in deferring high investments in generation, transmission and distribution networks. Thus DSM applied to electricity systems provides significant economic, reliability and environmental benefits. Opportunities for reducing energy demand are numerous in all sectors and many are low-cost, or even no cost, items that most enterprises or individuals could adopt in the short term, if good energy management is practiced.

In view of absence of any data, an exercise has been undertaken using data from other states such Rajasthan & Andhra Pradesh. Going by the experience of these states, one finds the most common measures of DSM and the average normative savings for each measure are as furnished below:

Table-9.1

Sector	DSM Technique	Energy saving Potential as % of total consumption	Investment/MU of savings (INR Crores)
Agriculture	Replacement with Energy efficient pump Sets	27%	1.5
Domestic	Replacement of ICLs with LED bulbs	23%	0.8
Commercial building	Retrofitting of Energy efficient equipments	15%	1.5
Public water Works (PWW)	Replacement with energy efficient Pumps	26%	0.6
Municipal Street lighting(MSL)	Replacement of existing street light with LEDs	51%	2.0

Application of the above provides substantial energy savings per year. In Street lighting, the saving potential is maximum, because in this sector DSM can be planned and implemented by municipal authority. Public water works is a government organization and hence penetration rate is quite high. In other sectors, serious awareness campaign through stakeholders' consultation is required to achieve and enhances the desired energy savings.

Enlisted below are the DSM measures and energy efficiency initiatives being taken up in the state of Haryana.

- Mandatory use of CFL in Govt building / Govt aided institutions / Boards / Corporations.

- For promotion of Solar water heating system in domestic sector, a rebate of Rs 100/-, Rs 200/- and Rs 300/- per month on electricity bills, to the users of Solar water heaters of capacity 100 LPD, 200 LPD and 300 LPD capacities respectively for a period of 3 years is being given.
- Solar Water Heating System has been made mandatory in industries where hot water is required for processing, hospitals and nursing homes, Govt. hospitals, hotels, motels and banquet halls, jail barracks, canteens, housing complexes set up by Group Housing Societies/Housing Boards, all Residential buildings built on a plot of size 500 sq. yds. and above falling within the limits of Municipal Committees/



Corporations and HUDA Sectors, all Govt. buildings, Residential Schools, Educational Colleges, Hostels, Technical/Educational Institutes, District Institute of Education and Training, Tourism Complexes and Universities etc.

- Use of 4 star rated pumps has been mandated for agriculture sector. 4 star rated distribution transformer are being used purchased.

Policy and notification in Place

There is enormous potential of saving of energy up to 20-25% in different sectors of the economy in the state. Energy Conversation Measures shall be implemented and enforced in the state in accordance with the provisions contained in the Energy Conservation Act-2001, in consultation with Bureau of Energy Efficiency, Ministry of Power and Government of India.

List of notifications/ Govt. orders issued by GoH for Energy Conservation in the State:

- Haryana Govt. Gazette Notification No. 22/52/2005-5P dated 29/7/2005 for
 - Mandatory use of Solar Water Heating Systems
 - Mandatory use of Compact Fluorescent Lamp (CFL) in Govt. Building / Govt. aided Institutions/ Boards/ Corporations
 - Mandatory use of ISI marked motor pump sets, power capacitors, foot/reflex valves in Agriculture sector
 - Promotion of energy efficient building design in Govt. Sector
- Haryana Govt. Gazette Notification No 22/52/2005-5P (RE) dated 31/10/2005 on constitution of the State Level Monitoring Committee under the Chairmanship of the Chief Secretary, Haryana to monitor implementation of Energy Conservation Measures as well as Energy Conservation Act 2001.
- To promote Energy Efficient appliances in the Govt. Sector, HAREDA has issued instruction vide memo no. DRE/2007/4720-4919 dated 13.11.2007

for purchase of minimum 4 star rated products like deep refrigerators, air conditioners, fluorescent tube lights and transformers to all Govt. Departments/ Corporations. In addition to this, the guidelines issued by the Ministry of Finance, Govt. of India on 21.1.2013 regarding procurement of energy efficient electrical appliances have also been circulated to all Departments / Corporations of the State for compliance vide HAREDA letter no. DRE/HAREDA/2013/7780 dated 29/3/13.

- Haryana Govt. Gazette Notification No. 22/52/05-5P dated 7/09/2006 for mandatory use of T-5 (28 watt) energy efficient tube light system/ retrofit assembly in Govt. buildings/ Govt. aided institutions/ Boards/ Corporations.
- The Haryana Govt. has issued a Notification on 25.06.2008 (amendment) for Energy Conservation in the lighting sector as per detail given below:
 - Mandatory use of Compact Fluorescent Lamps (CFLs) and T-5 (28 Watt) Tube Lights:
 - (a) The use of Compact Fluorescent Lamps (CFLs) and/or T-5 (28 Watt) energy efficient tube lights and/or Light Emitting Diode (LED) lamps shall be mandatory for all electricity consumers in industrial, commercial and institutional sectors having connected load of 30 Kilo Watt or above.
 - (b) In all Central Government Offices and Central Public Sector Undertaking Institutions / establishments located in the State of Haryana, the use of Compact Fluorescent Lamps (CFLs) and/or T-5 (28 Watt) energy efficient tube lights and/or Light Emitting Diode (LED) lamps shall be mandatory.
 - Mandatory use of Energy Efficient Street lights:

Street lighting in all existing and new colonies and urban areas notified by the



Urban Local Bodies Department, Haryana Urban Development Authority sectors, Haryana State Industrial & Infrastructure Development Corporation industrial estates, housing complexes, colonies and townships developed by private / semi government/ autonomous institutions using energy efficient street lighting fixtures using T-5 tube lights/ Light Emitting Diode (LED) Lamps/ Low Pressure Sodium Vapour (LPSV)/ High Pressure Sodium Vapour (HPSV) / induction arc lamps shall be mandatory.

- Installation of minimum 4 star rated pump sets made and ISI marked power capacitors, foot/reflex valves mandatory for all new tube well connections in agriculture sector as per Haryana Government Gazette Notification dated 07.10.10.
- Gazette notification no. SE/ PWD (B&R)/ Ambala/ CZC/8 dated 4th November, 2010 for amendment in the Haryana Scheduled Rates (HSR) to promote energy efficiency in building materials for implementation of ECBC.

Interventions

The agricultural sector accounted for about 28% of the state's energy consumption during FY 2014-15. There is substantial saving potential (up to 27% of agricultural load) exists in this sector through replacement programmes by energy efficient pumps. However, actual potential of savings in the state on account of DSM can be ascertained only after completion of DSM plan for state.

Domestic sector accounted for about 22% of the state's energy consumption during FY 2014-15. In order to stimulate investments in energy efficient lighting projects, high quality LED lamps are proposed to be given to households at the cost of incandescent lamps (ICLs) to encourage them to invest in energy efficiency under the Domestic Efficient Lighting Program (DELP).

The Domestic Efficient Lighting Programme (DELP) seeks to promote high quality LED lighting in the domestic sector by overcoming the high first cost barrier. DELP will enable sale of LED bulbs from designated places at a cost that is much less than the market price of Rs. 350-450 as replacements of Incandescent Lamps (ICLs). The programme will reduce installed load by 150 MW as shown in Table-9.2 and will lead to annual energy consumption reduction of the state by more than 180 million kWh. The saved energy can be sold to better paying consumers like Industry and Commercial, which will provide additional

DELP KEY FEATURES

- LED at cost of Rs. 95-105 as against a market price of Rs 350-450
- Consumer take LED bulb at Rs. 10/-, Balance paid by DISCOM from energy savings or by consumer in 8-12 months installment.
- 3 years free replacement warrantee
- No impact on tariff
- Total upfront investments by EESL
- Benefits sharing approach

revenue stream to the state utility.

ICLs are extremely energy inefficient form of lighting. In contrast, LEDs consume a fraction of energy used by ICLs to provide better light output. A single LED outlasts about 30 ICLs, and hence on life cycle cost effectiveness it fares better than ICL and CFL. However, the penetration of LEDs is very low because of their high first cost. To overcome this barrier, Energy Efficiency Services Limited (EESL), has been implementing programmes in several states to provide high quality LEDs as replacements to ICLs and CFLs at a cost of Rs. 95-105 each to residential consumers.

EESL, procures the LEDs bulbs and provides to consumers at an initial rate of Rs. 10 each (balance by DISCOM from energy savings or by consumer in installment) as against their market price of Rs. 350-450.



Table-9.2

No of Household Consumers targeted	40.92 lakhs
No. of inefficient ICLs and CFLs to be replaced	81.85 lakhs
Total reduction of connected load in the state	150 MW
Total energy consumption reduction in the state	180 million kWh
Energy bill reduction for households per annum	Rs. 200-300
Cost reduction for DISCOMS per annum of peak power	Rs. 192 Crores
Upfront investment by State/ DISCOM	Nil
Total Program Investment by EESL/ Lighting companies*	Rs. 90 Crores
Recovery of cost	1. DISCOM Repayment 2. Consumer Repayment

Note: * Taxes such as service tax, sales tax, or any other taxes as applicable will be charged on actual basis which is not included in these amounts.

EESL will make / arrange the upfront investment estimated at Rs. 90 Crore for procurement, transportation, distribution of 81.85 lakhs LED.

Approach / Strategy

All the above interventions involve replacement of inefficient equipment / appliances with energy efficient ones for the agriculture, domestic, commercial buildings and municipalities. **These can be undertaken by the State Government. at no upfront cost by using the Energy Service Company (ESCO) model.** The model is based on the concept of promoting Performance Contract mode where the company invests in any project by entering into a contract agreement with the facility owner which is recovered through the savings accrued due to reduced electricity bills.

Actions Points

The sector-wise Central Government and State Government actions envisaged to facilitate implementation of energy efficiency measures as mentioned above are detailed below:

Central Government

- BEE may consider formulation of specification for LED bulbs and introducing star label scheme for LED bulbs.
- Energy Efficiency Services Limited (EESL) to take up project design and project development.

State Government

- Distribution Companies / Utilities may file DSM petition with Haryana Electricity Regulatory Commission for getting sanction of the proposed DSM plan.
- Ensure formulation of a detailed time line in consultation with concerned departments like Distribution Companies for implementation of energy efficiency measures in municipalities.
- Ensure establishment of a payment security mechanism so that the company making investments under the ESCO mode recovers the same through the savings accrued due to reduced electricity bills.

Central Government

- BEE may provide technical support for effective enforcement of ECBC and promotion of ESCO based retrofitting works in Government buildings. BEE can provide support for capacity building of state department through establishment of ECBC cells for compliance of ECBC and retrofitting in Government buildings.



- Energy Efficiency Services Limited (EESL) to take up project design and project development for retrofitting in commercial buildings.

State Government

- Government of Haryana has to adopt ECBC Directives for new commercial building design and mandated energy audit of existing commercial building once in a three-year period. Effective enforcement of ECBC compliance and mandating retrofitting in energy-audited buildings may result in reduction of electrical consumption from commercial sector. Government of Haryana may consider mandatory retrofitting in Government buildings with an objective of reduction of electricity bills, which state government is paying against electricity bill of these buildings. This would also demonstrate impact of ESCO based retrofitting projects to private building owners to adopt the same.
- As per the Planning Commission's projection; residential building are becoming one of the

larger consumers of electricity in the country by 2030. BEE is introducing design guidelines for energy efficient multi storey residential apartments including in the composite and hot & dry climatic zone. State Government may mandate compliance of these guidelines through institutional framework in the state.

- For residential buildings, the state could adopt the star labeling scheme for multi-storey residential apartment buildings, being prepared by BEE.

In addition to the above, Haryana Electricity Regulatory Commission (RERC) may be requested to issue directives for creation of DSM funds by DISCOMs / Utilities of the State so that DSM activities can get extra emphasis. Such funds can be utilized for meeting incremental cost of efficiency improvement.

It may be noted that the cost and saving of energy figs have been worked out on a notional basis in absence of GoH's data on that. Therefore, these figs have not been considered in others tables for any calculation.



CHAPTER – 10 : FINANCIAL VIABILITY OF DISTRIBUTION COMPANIES

Financial Position

After unbundling of the erstwhile Haryana State Electricity Board (HSEB) on 14th August, 1998 Haryana had two different companies viz. HPGCL and HVPNL. However HVPNL was

further restructured on 1st July, 1999 and formed two new Discoms viz. UHBVNL and DHBVNL having separate entity from HVPNL.

The details of Discom wise Accumulated losses are as follows:

Table-10.1

(Rs. in Crores)

Name of Discom	Accumulated Losses as on 31/03/2013 (Rs.)	Accumulated Losses as on 31/03/2014 (Rs.)
UHBVNL	14,720	13,894
DHBVNL	8,637	10727
Total	23357	24621

Source: Annual Report for FY 2013-14

Both the discoms of Haryana incurred losses during FY 2012-13 and FY 2013-14 as follows:-

Table-10.2

Discom wise Financial losses (Rs Crores)

Year	UHBVN	DHBVN	Total
FY 2012-13	2297	1352	3649
FY 2013-14	1465	2089	3554

Source: Annual Report for FY 2013-14

The above figures show while UHBVN was successful in reducing its loss in FY 2013-14 from FY 2012-13, DHBVN losses increased in FY 2013-14 as compared to FY 2012-13. The main reason for the reduction of loss of UHBVN was not its operational efficiency, but due to transfer of Jind circle from UHBVN to DHBVN during FY 2013-14.

Financial restructuring scheme of GOI (October 2012)

Based on the recommendations of Shri B. K. Chaturvedi Committee, the Ministry of Power, Government of India notified a Scheme on 5.10.2012 for long term sustainability of the Discoms in the country.

The scheme is of significant importance to the electricity sector of Haryana as it intends to

clear up significant debts of the Haryana utilities.

Haryana was one of the early movers for providing consent to participate in the above Scheme.

The heavy financial losses and cash deficit currently faced by the distribution utilities of Haryana are attributable to the compounded effect of several issues as detailed in the following sub-section:

- No tariff increase for nine years (from 2001 to 2010).
- Increased cost of short-term power purchase & unscheduled interchange.
- Disallowance of cost in the ARR.



- Non-amortization of regulatory asset.
- Delayed as well as under-recovery of Fuel Surcharge Adjustment (FSA).
- Increase in employee cost due to impact of 6th pay commission and hike in DA rates.
- Inadequate RE subsidy.
- Outstanding receivables from sundry debtors - amount ranging between Rs 4000 Crores and Rs 5000 Crores has led to increased borrowings. Sundry debtors for both the DISCOMS as on 31st March 2012 and 31st March 2011 stood at Rs. 4913 Crores and Rs. 4291 Crores respectively.

To achieve financial turnaround, while

availing the one time benefits of the above mentioned scheme, Haryana Discoms, namely UHBVN and DHBVN, have approached a consortium of commercial banks led by Oriental Bank of Commerce.

- The financial losses for the Discoms have seen an increase in recent years owing to which the borrowings of the Discoms have reached to level of more than Rs. 15648 Crores (long term borrowings) till March 2012.
- The draft FRP of the Haryana Discoms was considered by the State Cabinet and takeover of short term liabilities amounting to Rs. 8162 Crores were approved.

Compliance Status of Mandatory Conditions under FRP

Table-10.3

Sl. No.	Particular	Latest Position
1	State Government/Discoms not to resort to short term loans from Banks/FIs to fund operational losses except as provided in the scheme.	No funding from the banks is envisaged except the funding already provided under the FRP.
2	State Government shall make a firm commitment to underwrite the shortfall as equity or interest free loan on annual basis if projections in FRP are not achieved and provide the shortfall annually.	State Cabinet has already approved the implementation of the entire FRP scheme by the Haryana Discoms.
3	Release of Agriculture subsidy should be based on the Feeder/Distribution transformer meter data.	HERC is allowing the subsidy on the basis of feeder data as such this condition is being complied with.
4	State Level Monitoring Committee to be constituted.	SLMC have been constituted vide notification no. 31/15/2012-IFICW dated 02.04.13 and re-constituted on 30.10.2013.
5	FRP may be part of the State Budget. State to enact legislation within twelve months from the date of circulation of model legislation by MoP.	Draft Model State Electricity Distribution Responsibility Bill has already been send to State Govt, for enactment.
6	Takeover of bonds issued by Discoms equal to 50% of short term liabilities (STL) and providing support in payment of interest and repayment of principal – <i>If fiscal space is not available with the State, then the takeover may be staggered over the next 2-5 years.</i>	Bonds of Rs. 7366.60 crores have already been issued by the Discoms to the Banks and State Govt. is bearing the interest liability on these bonds. However, the takeover plan for these bonds of the State Govt. is yet to be finalized.
7	Subsidy to be given in advance.	The State Govt. is providing the Subsidy to the Discoms on monthly basis out of State Budget.
8	Future Tariff Orders to be issued by 30 th April of each year, as per model tariff regulations	ARR of FY 2015-16 has been filed on 01.12.2014 (30.11.2014 being holiday) and the HERC order has been issued.
9	Allowing Fuel Surcharge Adjustment (FSA) to offset increase in power purchase	Discoms are levying the FSA as per the HERC regulations.
10	Approval of FRP	FRP stands approved- By State Cabinet on 29.03.2013 By Lenders on 10.06.2013 By HERC (in-principle) on 12.11.2013

Sl. No.	Particular	Latest Position
11	Issue bonds on behalf of State Government equal to 50% of STL corresponding to accumulated losses as on 31.03.2012	Bonds of Rs. 7366.60 Crores issued by the Haryana Discoms to Banks on 22.11.2013 @ 9.80% p.a.
12	Submission of time bound plan for liquidation of Regulatory Asset	Liquidation of 45% of regulatory assets is already allowed in the Tariff order for the FY 2013-14.
13	Preparation of roadmap for Private Sector participation	Hon'ble HERC has issued guidelines on deployment of franchisee in the retail supply business. Discoms considered the same and proposed changes in some clauses to Hon'ble HERC. The matter is still under consideration.
14	Target to reduce short term power purchase by 5-10% from FY 14 onwards	Adequate long term power purchase agreements (PPAs) are in place for the DISCOMs. A power surplus situation presently exists and is visualized to continue up to 2018-19.
15	Facility of Working Capital to be limited to purchase and Discounting of bills in line with Shunglu committee recommendations	No fresh working capital loans are being tied up by the DISCOMs except those already sanctioned under FRP scheme.

Financial Viability

Based on the road map discussed in the previous chapters, various scenarios have been prepared to visualize the profitability from operating the business as per the roadmap and sensitivity thereof with changes in important input parameters like tariff and AT&C losses. However, the analysis has been restricted up to FY 2018-19 being the analysis framework for 24x7 PFA initiatives.

The following scenarios have been detailed in subsequent sections:

- At targeted growth rate as per "24x7 Power for All" Road Map (Base case).
- At targeted growths and loss reductions as per roadmap and turnaround considerations using tariff hikes.
- Non-Adherence to AT & C Loss Reduction Trajectory and subsequent dependence on higher Tariff Hike.
- Keeping all other parameters same with funding for all schemes including those under Gol schemes as per Debt: equity ratio 70:30.
- Scenario considering provisions under newly constituted UDAY Scheme.

Common Assumptions

- No change in power purchase cost, as any change in the power purchase cost will be taken care by the Fuel and Power Purchase Cost Adjustment mechanism.
- Average cost of power purchase considered as Rs. 4.26 per unit excluding intrastate transmission charges of 16 paise/unit. The details are given as hereunder:

Table-10.4

Sl. No.	Description	UHBVN	DHBV N	Total
1.	Total Energy purchased (MU)	21119	26405	47524
2.	Less Interstate transmission losses (MU)	963	1039	2002
3.	Energy at state periphery (MU)	20156	25366	45522
4.	Total Purchase cost (lakh Rs.)	856772	1048961	1905733
5.	PGCIL Charges (lakh Rs.)	Included	32174	32174
6.	Total cost at State Periphery (lakh Rs.)			1937908
7.	Total purchase cost/unit (Rs/kWh)			4.26
	Say			4.26

Source: Annual Report 2013-14

- Escalation towards O&M cost(excl employees cost) and administrative and General expenses has been considered @ 6% p.a. in line with average changes in WPI;



Table-10.5

Month/ Year	WPI Indices	CPI Indices
Average2012-13	178	215
Average2013-14	168	236
Increase	5.95%	9.8%
Say	6.0%	10%

Source : eaindustry.gov.in

4. Escalation towards Employee Cost considered @ 10% p.a. based on CPI Indices.
5. Purchase Demand considered as forecasted in previous chapters.
6. Grant, Loan and Equity ratio has been considered as 60%:30%:10% (considering 15% addl. grants as incentives for achieving the targets). Ongoing schemes like RAPDRP and RGGVY are considered as per their respective guidelines and all other investments have been considered for funding as per Debt equity ratio 70:30.
7. Interest computation has been done as per the existing loan profiles of Haryana discoms and future loans @13% p.a.
8. Average billing rate (ABR) for FY 2014-15 has been arrived based on figs in APR FY 2014-15 and the same works out to Rs. 4.55 / kWh. After factoring in the 8.62% hike in tariff proposed from FY 2015-16 and using the emerging consumer mix for FY 2015-16 onwards, the average billing rate works out as Rs 4.95/kWh for FY 2015-16 and Rs 4.94/kWh for subsequent years. The details of average ABR calculation for FY 2014-15 is given in Table-10.6 below. The ABR calculation for subsequent years can be seen from Annexure-XIII.

Table-10.6

Sl. No	Description	UHBVN	DHBVN	Total
1.	Energy (MU)			
	-Domestic	2749	4072	6821
	-Other than Domestic	9414	14020	23434

Sl. No	Description	UHBVN	DHBVN	Total
2.	Revenue (Crore Rs.)			
	-Domestic	1155	1709	2865
	-Other than Domestic	4327	6571	10897
3.	Total			
	-Energy(MU)			30255
	-Revenue(Crore Rs)			13762
3.	Average Billing rate (Rs./ kWh)			4.55

Source : APR FY 2014-15

9. Intrastate transmission charges considered as Rs. 0.16 per unit (Based on annual report FY 2013-14). The same is shown hereunder :

Table-10.7

Sl. No.	Description	UHBVN	DHBVN	Total
1.	Energy Input at state periphery (MU)	17720	24116	41835
2.	Charges paid (Lakh Rs.)	34675	31999	66674
3.	Intrastate Transmission charges (Rs./ Unit)			0.16

Source: Annual Report FY 2013-14

10. Depreciation has been computed @ average 3.22% (Based on past trends) for existing assets and 5.28% for new incoming assets.
11. Escalation towards Meter Rent & Other Receipts has been considered @ 4% p.a. as per CAGR of no. of electrified households and Other income considered growing@ 10% p.a.
12. Revenue subsidies & Grants considered same as previous period levels.
13. Revenues from sale of surplus energy to outside states have been considered @Rs 3.00/kWh as stated by state.
14. Receivables against supply of power has been projected @ 2 months level.



15. Liabilities for purchase of power have been considered as 2 month of power purchase & transmission charges.
16. Collection efficiency assumed as 100%.

Assumptions

- ✓ No tariff hike and change in power purchase cost.
- ✓ T&D losses, AT&C losses and Collection Efficiency as per targeted trajectory.

Scenario A: Targeted Growth Rate as per 24x7 Road Map (Base Case)

Table-10.8A

Financial Position of the Utilities (Scenario A)

(Rs. In Crores)

Description	Units	2015-16	2016-17	2017-18	2018-19
Total unrestricted energy required		39377	43751	48624	54054
Requirement at state periphery	MU	51900	56350	61379	66821
AT & C Losses	%	22.20%	20.40%	18.80%	17.10%
Collection efficiency	%	100.0%	100.0%	100.0%	100.0%
T&D Losses		24.1%	22.4%	20.8%	19.1%
Power purchase cost(At state periphery)	Rs/Unit	4.26	4.26	4.26	4.26
Energy available at state periphery	MU	70543	72426	73872	75102
Energy Purchased(At state periphery)	MU	70543	72426	73872	75102
Revenue Parameters					
Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Tariff increase	%	0%	0%	0%	0%
Effective Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Energy sold within state	MU	39377	43751	48624	54054
Energy sold to other state	MU	18643	16076	12493	8281
Expense					
Employ cost escalation	%	10%	10%	10%	10%
Repair & Maintenance escalation	%	6%	6%	6%	6%
Administrative & General escalation	%	6%	6%	6%	6%
Financial position of Utility	SCN-A			(In Crore Rs)	
		2015-16	2016-17	2017-18	2018-19
Net sales-Power		25084	26436	27768	29187
Other income like meter rent,theft recov etc		1343	1395	1449	1505
Subsidies		4982	4982	4982	4982
Other income		402	442	486	535
Total Income		31811	33255	34685	36208
Expenditure					
Transmission charges	@0.159 /Unit	823	894	974	1060
Power Purchase		30031	30832	31448	31972
Employee cost		1817	1999	2199	2418
R & M Cost		Incl.	Incl.	Incl.	Incl.
Admn. & General expenses		371	394	417	442
Others		0	0	0	0
Total expenses		33043	34119	35038	35893
Gross Profit		-1231	-864	-353	316
Interest		3397	4345	5365	6300
Depreciation		450	619	780	842
Profit before tax		-5079	-5829	-6498	-6826
Tax		0	0	0	0
Net Profit after taxes		-5079	-5829	-6498	-6826



Table-10.8B**(Rs. In Crores)**

cash inflow	2015-16	2016-17	2017-18	2018-19
-Grants	486	829	781	0
-Equity	696	918	768	0
-Long term loans	1678	2050	1747	0
-Profit before Tax	-5079	-5829	-6498	-6826
-Depreciation	450	619	780	842
-Interest	3397	4345	5365	6300
-Bank borrowings for working capital	129	142	156	170
-Security deposit from consumers	154	170	187	205
Deposit for Electrification, Service Connection etc.	15	17	18	20
-Short term borrowings	14764	23288	32309	41726
Total cash inflow	16692	26548	35614	42438
Cash outflow				
-capital expenditure	2861	3796	3296	0
-Loan repayments	3706	3706	3706	3846
-Repayment of short term borrowings	6732	14764	23288	32309
-Interest payouts	2522	2426	2338	2100
-Increase in working capital	-4	-64	-42	-17
-Interest on short term borrowings@13% p.a.	875	1919	3027	4200
-Tax	0	0	0	0
Total cash outflow	16692	26548	35614	42438
Net cash inflow	0	0	0	0
Opening cash balance from previous year	0	0	0	0
Closing cash balance	0	0	0	0

The projected scenario exhibits the continuation of loss making situation in the forthcoming period and tariff hikes would be required if turnaround is to be achieved.

Scenario B: Targeted Growth Rate as per 24x7 Road Map and Turnaround with Tariff Hikes.

Assumptions

- ✓ At targeted growth rates and loss reduction as per road map.
- ✓ Turnaround considering tariff hike.



Table-10.9A

Assumptions for Scenario B

(Rs. In Crores)

Description	Units	2015-16	2016-17	2017-18	2018-19
Total unrestricted energy required		39377	43751	48624	54054
Requirement at state periphery	MU	51900	56350	61379	66821
AT & C Losses	%	22.20%	20.40%	18.80%	17.10%
Collection efficiency	%	100.0%	100.0%	100.0%	100.0%
T&D Losses		24.1%	22.4%	20.8%	19.1%
Power purchase cost(At state periphery)	Rs/Unit	4.26	4.26	4.26	4.26
Energy available at state periphery	MU	70543	72426	73872	75102
Energy Purchased(At state periphery)	MU	70543	72426	73872	75102
Revenue Parameters					
Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Tariff increase	%	6%	6%	5%	4%
Effective Average billing rate	Rs/Unit	5.25	5.55	5.83	6.06
Energy sold within state	MU	39377	43751	48624	54054
Energy sold to other state	MU	18643	16076	12493	8281
Expense					
Employ cost escalation	%	10%	10%	10%	10%
Repair & Maintenance escalation	%	6%	6%	6%	6%
Administrative & General escalation	%	6%	6%	6%	6%
Financial position of Utility		SCN-B		(In Crore Rs)	
		2015-16	2016-17	2017-18	2018-19
Net sales-Power		26254	29107	32086	35248
Other income like meter rent,theft recov etc		1343	1395	1449	1505
Subsidies		4982	4982	4982	4982
Other income		402	442	486	535
Total Income		32981	35926	39003	42269
Expenditure					
Transmission charges	@0.159 /Unit	823	894	974	1060
Power Purchase		30031	30832	31448	31972
Employee cost		1817	1999	2199	2418
R & M Cost		Incl.	Incl.	Incl.	Incl.
Admn. & General expenses		371	394	417	442
Others		0	0	0	0
Total expenses		33043	34119	35038	35893
Gross Profit		-62	1807	3966	6377
Interest		3397	4218	4905	5254
Depreciation		450	619	780	842
Profit before tax		-3909	-3030	-1720	281
Tax		0	0	0	0
Net Profit after taxes		-3909	-3030	-1720	281

Table-10.9B**(Rs. In Crores)**

cash inflow	2015-16	2016-17	2017-18	2018-19
-Grants	486	829	781	0
-Equity	696	918	768	0
-Long term loans	1678	2050	1747	0
-Profit before Tax	-3909	-3030	-1720	281
-Depreciation	450	619	780	842
-Interest	3397	4218	4905	5254
-Bank borrowings for working capital	129	142	156	170
-Security deposit from consumers	154	170	187	205
Deposit for Electrification, Service Connection etc.	15	17	18	20
-Short term borrowings	13784	19753	24264	26856
Total cash inflow	16882	25685	31886	33629
Cash outflow				
-capital expenditure	2861	3796	3296	0
-Loan repayments	3706	3706	3706	3846
-Repayment of short term borrowings	6732	13784	19753	24264
-Interest payouts	2522	2426	2338	2100
-Increase in working capital	186	180	226	265
-Interest on short term borrowings@13% p.a.	875	1792	2568	3154
-Tax	0	0	0	0
Total cash outflow	16882	25685	31886	33629
Net cash inflow	0	0	0	0
Opening cash balance from previous year	0	0	0	0
Closing cash balance	0	0	0	0

The scenario exhibits the extent of tariff hikes required to make turnaround of situation as shown under scenario –A. The tariff hikes to the tune of 6% in FY 2015-16 to FY 2016-17, 5% in FY 2017-18 and 4% in FY 2018-19 would be able to make turnaround by FY 2018-19.

Scenario C: Non-Adherence to Performance Parameters (Loss Reduction Trajectory) and subsequent dependence on Higher Tariff Hike.

Assumptions

- ✓ AT&C losses higher by 1% than the targeted trajectory.
- ✓ Power purchase cost constant for all the years.



Table-10.10A

Financial Position of the Utility (Scenario C)

(Rs. In Crores)

Description	Units	2015-16	2016-17	2017-18	2018-19
Total unrestricted energy required		39377	43751	48624	54054
Requirement at state periphery	MU	52576	57067	62145	67637
AT & C Losses	%	23.20%	21.40%	19.80%	18.10%
Collection efficiency	%	100.0%	100.0%	100.0%	100.0%
T&D Losses		25.1%	23.3%	21.8%	20.1%
Power purchase cost(At state periphery)	Rs/Unit	4.26	4.26	4.26	4.26
Energy available at state periphery	MU	70543	72426	73872	75102
Energy Purchased(At state periphery)	MU	70543	72426	73872	75102
Revenue Parameters					
Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Tariff increase	%	0%	0%	0%	0%
Effective Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Energy sold within state	MU	39377	43751	48624	54054
Energy sold to other state	MU	17967	15359	11727	7465
Expense					
Employ cost escalation	%	10%	10%	10%	10%
Repair & Maintenance escalation	%	6%	6%	6%	6%
Administrative & General escalation	%	6%	6%	6%	6%
Financial position of Utility	SCN-C			(In Crore Rs)	
		2015-16	2016-17	2017-18	2018-19
Net sales-Power		24882	26221	27538	28942
Other income like meter rent,theft recov etc		1343	1395	1449	1505
Subsidies		4982	4982	4982	4982
Other income		402	442	486	535
Total Income		31608	33040	34455	35964
Expenditure					
Transmission charges	@0.159 /Unit	834	905	986	1073
Power Purchase		30031	30832	31448	31972
Employee cost		1817	1999	2199	2418
R & M Cost		Incl.	Incl.	Incl.	Incl.
Admn. & General expenses		371	394	417	442
Others		0	0	0	0
Total expenses		33053	34130	35050	35905
Gross Profit		-1445	-1091	-595	58
Interest		3397	4369	5420	6394
Depreciation		450	619	780	842
Profit before tax		-5292	-6078	-6795	-7177
Tax		0	0	0	0
Net Profit after taxes		-5292	-6078	-6795	-7177

Table-10.10B**(Rs. In Crores)**

cash inflow	2015-16	2016-17	2017-18	2018-19
-Grants	486	829	781	0
-Equity	696	918	768	0
-Long term loans	1678	2050	1747	0
-Profit before Tax	-5292	-6078	-6795	-7177
-Depreciation	450	619	780	842
-Interest	3397	4369	5420	6394
-Bank borrowings for working capital	129	142	156	170
-Security deposit from consumers	154	170	187	205
Deposit for Electrification, Service Connection etc.	15	17	18	20
-Short term borrowings	14943	23714	33030	42796
Total cash inflow	16657	26748	36093	43250
Cash outflow				
-capital expenditure	2861	3796	3296	0
-Loan repayments	3706	3706	3706	3846
-Repayment of short term borrowings	6732	14943	23714	33030
-Interest payouts	2522	2426	2338	2100
-Increase in working capital	-39	-66	-44	-20
-Interest on short term borrowings@13% p.a.	875	1943	3083	4294
-Tax	0	0	0	0
Total cash outflow	16657	26748	36093	43250
Net cash inflow	0	0	0	0
Opening cash balance from previous year	0	0	0	0
Closing cash balance	0	0	0	0

The scenario exhibits that non adherence to AT & C Loss reduction trajectory would compound the losses further and higher tariff hikes to the tune of 7% in FY 2015-16, 6% each in FY 2016-17 & FY 2017-18 and 2% in FY 2018-19 may be required to observe a turn around by FY 2018-19.

Scenario D: Targeted Growth Rate as per 24x7 Road Map and Considering all funding including GoI Schemes in the Debt Equity Ratio of 70:30.

Assumptions

- ✓ At targeted growth rates and loss reduction as per road map.
- ✓ Considering all funding including GoI Schemes in the Debt Equity Ratio of 70:30.



Table-10.11A

Financial Position of the Utility (Scenario D)

(Rs. In Crores)

Description	Units	2015-16	2016-17	2017-18	2018-19
Total unrestricted energy required		39377	43751	48624	54054
Requirement at state periphery	MU	51900	56350	61379	66821
AT & C Losses	%	22.20%	20.40%	18.80%	17.10%
Collection efficiency	%	100.0%	100.0%	100.0%	100.0%
T&D Losses		24.1%	22.4%	20.8%	19.1%
Power purchase cost(At state periphery)	Rs/Unit	4.26	4.26	4.26	4.26
Energy available at state periphery	MU	70543	72426	73872	75102
Energy Purchased(At state periphery)	MU	70543	72426	73872	75102
Revenue Parameters					
Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Tariff increase	%	0%	0%	0%	0%
Effective Average billing rate	Rs/Unit	4.95	4.94	4.94	4.94
Energy sold within state	MU	39377	43751	48624	54054
Energy sold to other state	MU	18643	16076	12493	8281
Expense					
Employ cost escalation	%	10%	10%	10%	10%
Repair & Maintenance escalation	%	6%	6%	6%	6%
Administrative & General escalation	%	6%	6%	6%	6%
Financial position of Utility	SCN-D			(In Crore Rs)	
		2015-16	2016-17	2017-18	2018-19
Net sales-Power		25084	26436	27768	29187
Other income like meter rent,theft recov etc		1343	1395	1449	1505
Subsidies		4982	4982	4982	4982
Other income		402	442	486	535
Total Income		31811	33255	34685	36208
Expenditure					
Transmission charges	@0.159 /Unit	823	894	974	1060
Power Purchase		30031	30832	31448	31972
Employee cost		1817	1999	2199	2418
R & M Cost		Incl.	Incl.	Incl.	Incl.
Admn. & General expenses		371	394	417	442
Others		0	0	0	0
Total expenses		33043	34119	35038	35893
Gross Profit		-1231	-864	-353	316
Interest		3418	4430	5536	6539
Depreciation		463	667	870	957
Profit before tax		-5113	-5961	-6759	-7180
Tax		0	0	0	0
Net Profit after taxes		-5113	-5961	-6759	-7180

Table-10.11B**(Rs. In Crores)**

cash inflow	2015-16	2016-17	2017-18	2018-19
-Grants	0	0	0	0
-Equity	858	1139	989	0
-Long term loans	2003	2658	2307	0
-Profit before Tax	-5113	-5961	-6759	-7180
-Depreciation	463	667	870	957
-Interest	3418	4430	5536	6539
-Bank borrowings for working capital	129	142	156	170
-Security deposit from consumers	154	170	187	205
Deposit for Electrification, Service Connection etc.	15	17	18	20
-Short term borrowings	14785	23393	32586	42269
Total cash inflow	16713	26654	35890	42980
Cash outflow				
-capital expenditure	2861	3796	3296	0
-Loan repayments	3706	3706	3706	3873
-Repayment of short term borrowings	6732	14785	23393	32586
-Interest payouts	2543	2508	2495	2303
-Increase in working capital	-4	-64	-42	-17
-Interest on short term borrowings@13% p.a.	875	1922	3041	4236
-Tax	0	0	0	0
Total cash outflow	16713	26654	35890	42980
Net cash inflow	0	0	0	0
Opening cash balance from previous year	0	0	0	0
Closing cash balance	0	0	0	0

This scenario exhibits that absence of grant funds would make considerable dent on overall profitability and tariff hikes to the tune of 7% in FY 2015-16, 6% in FY 2016-17, 5% in FY 2017-18 and 3% in FY 2018-19 would have to be resorted to in order to see turnaround by FY 2018-19.

Scenario E:

Assumptions:

- ✓ State to take over 75.0% of DISCOMs debt as on 30th Sept' 2015 over two years as 50.0% in FY 2015-16 and 25.0% in FY 2016-17.
- ✓ Interest rate on balance 25.0% to be charged at 9.0%



Table-10.12A

Financial Position of the Utility (Scenario E- UDAY SCHEME)

(Rs. In Crores)

Description	2015-16	2016-17	2017-18	2018-19
Total unrestricted energy required	39377	43751	48624	54054
Requirement at state periphery	51900	56350	61379	66821
AT & C Losses	22.20%	20.40%	18.80%	17.10%
Collection efficiency	100.0%	100.0%	100.0%	100.0%
T&D Losses	24.1%	22.4%	20.8%	19.1%
Power purchase cost(At state periphery)	4.26	4.26	4.26	4.26
Energy available at state periphery	70543	72426	73872	75102
Energy Purchased(At state periphery)	70543	72426	73872	75102
Revenue Parameters				
Average billing rate	4.95	4.94	4.94	4.94
Tariff increase	0%	0%	0%	0%
Effective Average billing rate	4.95	4.94	4.94	4.94
Energy sold within state	39377	43751	48624	54054
Energy sold to other state	18643	16076	12493	8281
Expense				
Employ cost escalation	10%	10%	10%	10%
Repair & Maintenance escalation	6%	6%	6%	6%
Administrative & General escalation	6%	6%	6%	6%
Financial position of Utility				
			(In Crore Rs)	
	2015-16	2016-17	2017-18	2018-19
Net sales-Power	25084	26436	27768	29187
Other income like meter rent,theft recov etc	1343	1395	1449	1505
Subsidies	4982	4982	4982	4982
Other income	402	442	486	535
Total Income	31811	33255	34685	36208
Expenditure				
Transmission charges	823	894	974	1060
Power Purchase	30031	30832	31448	31972
Employee cost	1817	1999	2199	2418
R & M Cost	Incl.	Incl.	Incl.	Incl.
Admn. & General expenses	371	394	417	442
Others	0	0	0	0
Total expenses	33043	34119	35038	35893
Gross Profit	-1231	-864	-353	316
Interest	2163	2146	2423	2864
Depreciation	450	619	780	842
Profit before tax	-3844	-3630	-3555	-3390
Tax	0	0	0	0
Net Profit after taxes	-3844	-3630	-3555	-3390

Table-10.12B**(Rs. In Crores)**

cash inflow	2015-16	2016-17	2017-18	2018-19
-Grants	486	829	781	0
-Equity	696	918	768	0
-Long term loans	1678	2050	1747	0
-Profit before Tax	-3844	-3630	-3555	-3390
-Depreciation	450	619	780	842
-Interest	2163	2146	2423	2864
-Bank borrowings for working capital	129	142	156	170
-Security deposit from consumers	154	170	187	205
Deposit for Electrification, Service Connection etc.	15	17	18	20
-Short term borrowings	3092	5711	8083	10358
Total cash inflow	5020	8971	11388	11070
Cash outflow				
-capital expenditure	2861	3796	3296	0
-Loan repayments	0	0	0	140
-Repayment of short term borrowings	0	3092	5711	8083
-Interest payouts	2163	1744	1680	1813
-Increase in working capital	-4	-64	-42	-17
-Interest on short term borrowings@13% p.a.	0	402	742	1051
-Tax	0	0	0	0
Total cash outflow	5020	8971	11388	11070
Net cash inflow	0	0	0	0
Opening cash balance from previous year	0	0	0	0
Closing cash balance	0	0	0	0

The scenario exhibits that that even after cleaning up the cumulative losses as on 31st March'2014, there would be need of mild tariff hikes of the order of 5% in FY 2016-17, 4% in FY 2017-18 and 2% in FY 2018-19 in order to have a turnaround by FY 2018-19.

Implication on Tariff

The additional investment to the extent required under state plans and share thereof in new schemes would have an impact on the tariff. The same has been worked out and presented in Annexure-XIV.



OTHER INITIATIVES

Communication

Successful implementation of 24X7 Power Supply Scheme requires clear communication among all the stakeholders across the value chain, including the consumers. In order to avoid potential roadblocks in implementation due to poor communication and flow of information, the following table lists the primary responsibility of each stakeholder and the corresponding method in which it will be carried out.

A centralized corporate communication team can be formed at headquarters of the DISCOM

for looking at activities of overall communication strategy.

The financial situation in Haryana makes it imperative to raise tariffs while other initiatives including 24X7 supply are implemented. Such tariff increases would inevitably impact consumers and meet with resistance. To address this, the utilities would clearly communicate their plans on implementing the reliable 24X7 supply scheme along with the other reliability and efficiency improvement measures that they are implementing. A high level of involvement of the Government of Haryana will also be required.

Table-11.1

Proposed Communication Responsibilities

Communication Objective	Responsibility	Frequency
“ Power for all” - Roll Out Plan	ACS, Power	Quarterly
Power Supply Position	MD Transco	Daily
Energy Savings & Conservation	MD, Discoms	Monthly
Planned Outages & Disruption	MD, Discoms	Daily
Real time feeder-wise Information	MD, Discoms	Daily
Status update on Deliverables	ACS, Power	Quarterly
Renewable Power	Director, State Renewable Energy Deptt	Quarterly
Generation- Projects, PLF & Fuel	MD, State Genco	Monthly
Transmission Projects – Physical Progress and Achievements	MD, Transco	Monthly
Distribution – Progress ,Achievements, Losses, Consumer Initiatives etc.	MD, Discoms	Monthly

Information Technology Initiatives

The need to adopt IT in every sphere of utility operation is pervasive. Power is a complex product that must be consumed on a real time basis. The overall value involved in the process is very high. Even more importantly it touches all citizens. Yet, the information systems that drive the operations of the sector are generally very basic and information transparency and consistency is poor. While sporadic efforts have been made in the past to improve this, quantum changes are required to increase IT adoption in all spheres of power sector operation.

In Haryana, IT adoption on a massive scale will required to be pursued in the following areas:

- At the corporate level, the operations need to be integrated through implementation of Enterprise Resource Planning Systems (ERP). This would cover critical aspects like Finance and Accounts, Asset Management, Inventory Management, Human Resource Management, Project Management, Personal information System (PIS). ERP will help in timely capitalization of asset, deriving better business value of investment etc.
- At the commercial operations level there is a need to comprehensively implement Customer Management Systems (CMS) for undertaking customer related processes including billing and collections, customer



complaint management, new connection provision etc.

- Centralized Information & Monitoring System for operational, enforcement & litigation, vigilance activities and analysis.
- Power management would require the institution of technically capable controlling facilities equipped with tools like SCADA and Distribution Management Systems (DMS) that allow for adequate visualization of the networks and response capabilities. Technologies for sub-station automation, GIS, SCADA, DMS, OMS, etc., shall be adopted. For the urban areas SCADA is quite useful for improving reliability and reduction of network downtime.
- Regional Distribution Control Centres (RDCC) within the State are proposed to be established. These will initially cater to the principal load centres, but would thereafter be expanded to all load centres of the state. This will be a key initiative, not only for effectively managing 24X7 supply, but also thereafter for other functions like forecasting.
- Renewable Energy Management centres shall be established and equipped with adequate capabilities through financing availed from KfW and ADB.
- Power procurement optimization tools will be implemented to reduce the power procurement costs and improve supply reliability. This shall be achieved through the institution of technically robust forecasting, scheduling and dispatch (Unit Commitment) and settlement tools. The tools shall be used to ensure that the control room operators have the ability to take real time decisions to ensure cost reduction.
- Project monitoring tools shall be incorporated in the PMU to ensure that progress on the investments in the state are monitored rigorously and bottlenecks identified.

- Standards of service specified under Section 57 of the EA 2003 shall be monitored. The utilities shall use IT tools to gather the information with regards to service standards with minimal manual intervention to ensure transparency and credibility.

The above need to be implemented urgently, and also need to be integrated with each other to ensure that the systems are inter-operable (i.e., they can talk to each other). For this the utilities shall evolve a detailed IT plan to implement the above in a well-coordinated manner.

Institutional Arrangement

A strong monitoring framework is essential to ensure the success of the “Power for all” scheme. The following structure is being proposed to undertake regular monitoring of the progress of all initiatives being under-taken in this scheme.

- **Government of India (GOI) Level Committee:** It is proposed that this committee will review the overall progress of the scheme on a quarterly basis and provide necessary support to ensure a coordinated response from the Central Govt. - where necessary. The committee may be constituted with the following members – PFC, REC, CEA, SECI, EESL, Ministry of Power Ministry of Coal, and MNRE.
- **State Government Level Committee:** It is proposed that a State level committee headed by the Chief Secretary will be formed to review the progress of the scheme on a quarterly basis. This committee will monitor the progress of the works undertaken as part of the scheme and issue directions to enable faster execution. This committee will be constituted with the following Principal Secretaries/ Secretaries of the Power, Finance, Urban Development, Agriculture and other relevant departments along with the CMD/Chairman/MD of state utilities.



- **Department Level Committee:** It is proposed that the Department level committee headed by the ACS power/Secretary Power will be formed and shall undertake steps required to ensure the projects are progressing as per the action plan. This committee will undertake progress reviews on a monthly basis. The committee will be constituted with the following members –ACS Power /Secretary Power and MDs of state power utilities.
- **District Level Committee** – It is proposed to constitute a district level committee headed by the Deputy Commissioner to take action that is necessary to ensure the projects are completed in a timely manner and address any issues pertaining to land or other relevant approvals. The committee will be constituted with the following members – Deputy Commissioner and Superintendent Engineer of state utilities.
- **Project Monitoring Unit (PMU)** – A project monitoring unit shall be set up for monitoring the progress of the works being undertaken under this scheme. The PMU will operate under the Secretary, Energy and shall be operated by an external independent agency. The PMU shall be responsible for undertaking coordination, preparing the action plans and monitoring progress of all works under the “Power for all” scheme. The PMU would also help facilitate in tracking the action steps and providing feedback to the various committee that are proposed to be set up under the scheme. Government of India shall provide grants for the PMU operations.

The committees that are being proposed above are required to be set up at the earliest to kick start the whole scheme. It is important that the committees keep meeting on a regular basis as per the frequency/ timelines mentioned above – to ensure that the objectives set out under the “Power for all” scheme are achieved.

Capacity Building

With the increase of IT in the Generation, Transmission & Distribution system and to meet the expectations of 24 X 7 power supply for the

consumers in the state, it is important to focus on capacity building of the employees for enhancement of technical know-how for latest technological developments and to increase the consumer satisfaction. The capacity building may also include consumer grievance system, awareness regarding importance of working with safety, outage management system, demand side management etc. It is also imperative to state that for serving the consumers in a different way change of mindset of the employees would be required. It is critical that Change Management initiatives are rolled out and institutionalized throughout the DISCOM for achieving better results. The details of the present employee in the Haryana Discoms is as under:

Employee base

As on 31.10.2014

Name of Nigam	Sanctioned strength	Working position	Vacancy position	Engaged through outsource	Net vacancy
HVPLN	10328	4542	5786	2015	3771
UHBVN	18329	9857	8472	3419	5053
DHBVN	18970	10998	7972	3889	4083
HPGCL	5697	3521	2176	0	2176
Total	53324	28918	24406	9323	15083
% vacancy			45.77%		28.29%

In view of the importance of the training on new technologies, there is a requirement for development and implementation of Human Resource training programme so as to realize the dream of 24 X 7 power supply system in the state in its true sense.

There is already a provision for Demand Side Management (DMS) trainings under various programmes of Bureau of energy Efficiency (BEE) and the same should be implemented to achieve the goal of 24 X 7 power for goal.



Following training programmes conducted by Discoms in the financial 2014-15 for up gradation of knowledge base of their Employees and will be conducted in the coming years:

Table-11.2

Sl. No.	Name of institute	Training module
1.	Power & Energy Division of Engineering staff college of India ,Hyderabad	Technology advances in metering, billing & collection.
2.	Power Line Magazine	Metering in India.
3.	India Infrastructure Publishing Pvt. Ltd.	IT in power progress and potential.
4.	Engineering Staff college of India (ESCI)	Pilferage of Electricity.
5.	Numerical Relay in Power system Protection	NTPC Power management institute, Noida.
6.	Financial power project	NTPC Power management institute, Noida
7.	Leadership & Change management	NTPC Power management institute, Noida
8.	Infraline Technologies (India) Pvt. Ltd.	Solar Power in India, opportunities, technology & challenges
9.	By Nigam senior officials	Crash Training schedule of ALMs (DC rate of newly recruited)
10.	Central Institution for Rural Electrification (CIRE)	Solar power Generation & Grid Enabling
11.	NTPC Chandigarh Interactive workshop	Sub Station & Transformer Maintenance interactive programme
12.	Power grid corporation of India Ltd.	Smart grid Pilot Project & regional smart grid capacity building.
13.	Engineering Staff college of India (ESCI)	Design Features & operations of Gas insulated Substations
14.	BSES	Emerging Technologies & Best practices in O&M
15.	Indian Chamber of commerce	8 th India Energy summit 2014-Energy for economic :Future outlook
16.	Central Institution for Rural Electrification (CIRE)	Technical specification, Construction Standards for distribution systems.
17.	The Energy & Resources Institute (TERI) with Global Sustainable Electricity Partnership	Strengthening Public-Private Partnership for Sustainable Electricity & Energy efficiency.
18.	IEEMA with CEA	New Generation High Performance Conductors.
19.	Engineering staff college of India (ESCI) campus, Gachibowli, Hyderabad	IT In Distribution for R-APDRP
20.	National Productivity Council	Leader ship & team work
21.	HETRI,Gurgaon	Safety manuals etc.
22.	Haryana Institute of Public Administration (HIPA)	Effective Implementation of RTI act-2005
23.	Haryana Institute of Public Administration (HIPA)	Change management(1 day)& e-Governance Project lifecycle(2 days)
24.	Haryana Institute of Public Administration (HIPA)	Government process Re-Engineering
25.	Haryana Institute of Public Administration	Detailed Project Report

Sl. No.	Name of institute	Training module
	(HIPA)	
26.	Haryana Institute of Public Administration (HIPA)	Business Model & PPP (2 Days) Project Management (3 days)
27.	BRPL, Delhi	Automation & SCADA application in Distribution system
28.	Hartron Bhawan, Panchkula	The training programme of specialized course-computer appreciation programme
29.	HETRI, Gurgaon	Training Need Analysis
30.	National Institute of urban affairs (NIUA) and PWC	Security Watch India
31.	National productivity Council	Leadership & team work
32.	Administrative Efficiency in Govt. Departments	Principal, Divisional Training centre, HIPA, Panchkula
33.	Haryana Litigation Policy, 2010 Handling of court cases-codal provision & Govt. Instructions	
34.	One day work shop on reservation Policy	
35.	Developing Effective communication skills through noting /drafting	
36.	Office automation tools-Computer Training on MS Word, MS Excel, MS Power point & Internet.	
37.	Central Board of Irrigation & power & CIGRE India	Power Transformers
38.	IIT ROORKEE	Past Go Live on revenue Management & Loss reduction covering GIS, Metering technology & Revenue Management
39.	HIP A	Office Automation & tools computer Training on MS Word, MS Excel, MS Power & Internet.

XEN / T&R is responsible for conducting training or any other training requirement for technical & Non technical employees.

Following courses to be conducted in year 2015

Table-11.3

Sl. No.	Name of the Course
1.	Refresher course for LM/ALMs
2.	Refresher course for CA/UDC/LDC
3.	Refresher course for SSA/ASSA/SAs
4.	Training programme for AEE/AE/JE/AFM/CA/CC/UDC/CASHIER etc on R-APDRP Scheme.
5.	Refresher course for HDM/DM/JDM
6.	Seminar on I/Tax (TDS) @ SERVICE Tax matter for officer/official.
7.	One day workshop for drivers.
8.	Seminar on RTI act-2005 for officials.
9.	Refresher course for JE-I/JE/AFM

CHAPTER - 12 : YEAR WISE ROLL OUT PLAN

Deliverables						
Power for All – Roll Out Plan	Units	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total
GENERATION						
State Sector	MW	-	-	-	-	-
Central Sector	MW	202	282.83	43	167.77	695.6
JV/Partnership Projects	MW	-	-	-	-	-
IPP Projects/Purchase	MW	-	40	200	-	240
NCE/RNES	MW	152	345	22	30	549
Total		354	667.83	265	197.77	1484.6
TRANSMISSION						
Inter State						
Substation (New)						
800 KV	Nos/MVA		1/3000			1/3000
400 KV	Nos/MVA	1/1000		3/3000		4/4000
220 KV	Nos/MVA					
Lines						
765 KV	ckt km	1300				1300
400 KV	ckt km	220				220
Substation (Augmentation)						
400/220 KV	Nos/MVA		3/1815	1/315		4/2130
Intra State						
400 KV Substation (New)	Nos/MVA			-	1/630	1/630
Lines	ckt km	5.5	35	-	10	50.5
220 KV Substation	Nos/MVA	9/2120	5/1340	8/1840	11/2540	33/7840
Lines	ckt km	261.5	385.66	51	49	747.16
132 KV Substation	Nos/MVA	4/145	1/75	4/375	1/75	10/670
Lines	ckt km	146	121.46	338.3	31.5	637.26
66 KV Substation	Nos/MVA	10/490.5	0/79	9/505	4/268	23/1342.5
Lines	ckt km	87.5	239	104.1	10	440.6



Sub-station (Augmentation)						
400 KV Substation	Nos/MVA		2/630	1/315		3/945
220 KV Substation	Nos/MVA	2/200	27/2790	20/1940		49/4930
132 KV Substation	Nos/MVA	48/1220	27/660	59/1574		134/3454
66 KV Substation	Nos/MVA	39/602.5	21/361	31/456.5		91/1420
DISTRIBUTION						
132/66/33/11/3.3 kv PSS	Nos	58	108	127		293
	MVA	2317.1	1913.3	3265.6		7496
11/0.415 New DTR	Nos	32200	33810	35499		101509
	MVA	2104	2209	2319		6632
No. and length of 33 kV lines	No.	65	119	129		313
	km					
Length of 11 kV lines	Km	128.98	156.95	1632.94	344.97	4484.87
Length of LT Lines	Km	1282.06	1831.47	1968.82	686.76	5082.35
No of households to be electrified	Lakhs	71300	71300	71300	71301	285201
Electrification of UE villages	Nos.	-	-	-	-	-
Electrification of UE Habitations	Nos.	3008	3460	4212	4362	10680
RENEWABLE ENERGY						
Solar PV (Through NIT route)	MW	0	175	0	0	175
SECI (Through PPA)	MW	120	0	0	0	120
Solar PV through NTPC	MW	0	150	0	0	150
Solar by HPGCL	MW	0	20	22	30	72
Bagasse	MW	25	0	0	0	25
Bio Mass	MW	7	0	0	0	7
Total		152	345	22	30	549



CHAPTER – 13 : SECTOR WISE INVESTMENT PLAN & FUND REQUIREMENT

(Rs in Crores)								
		Sector	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total	Remarks
Generation	Projects Under Expansion	PTPS Panipat (1x800 MW)	158.46	302.03	382.76	379.75	1223.00	70% debt (Rs 3187.38cr) will be arranged through loan from financial institutions. Expected COD 3rd Quarter of FY 2019-20
		DCRTPP, Yamuna Nagar (1x800 MW)	-	158.46	302.03	382.76	843.25	70% debt (Rs 3187.38 cr) will be arranged through loan from financial institutions.
								Expected COD 3rd Quarter of FY 2020-21
Total generation			158.46	460.49	684.79	762.51	2066.25	
Transmission	Intra State	New GSS	513.77	196.00	577.00	661.00	1947.77	
		Augmentation on existing sub-stations	201.65	334.45	346.20		882.30	
		Transmission line	246.92	488.11	193.76	52.00	980.79	
	Inter State							
Total Transmission			962.34	1018.56	1116.96	713.00	3810.86	
	State Plan							
Distribution			1029.33	789.10	1085.47	0.00	2903.90	
Proposed Schemes								
	IPDS							
			277.39	418.17	418.17	-	1113.73	New schemes by GOI which are being finalized by MOP as per norms of the schemes/policies
	DDUGJY							



(Rs in Crores)								
		Sector	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total	Remarks
			507.85	687.76	687.76	-	1883.37	New schemes by GOI which are being finalized by MOP as per norms of the schemes/policies
	RGGVY		17.02	-	-	-	17.02	
	RAPDRP		441.11	567.42	171.96	-	1180.49	
	SMART CITY		0.00	800.00	400.00	-	1200.00	
	JICA		461.78	461.78	532.85	-	1456.41	Sanctioned
	MGGBY		16.39			-	16.39	
	IBRD		110.18	72.23	0.00	-	182.41	Sanctioned
Total Distribution			2861.05	3796.46	3296.21	-	9953.72	
Renewable Energy	Solar PV (NIT ROUTE)	PRIVATE & SECI	-	1225.00	-	-	1225.00	
	SECI (Through PPA)		840.00	-	-	-	840.00	
	Solar PV through NTPC		-	1050.00	-	-	1050.00	
	Solar by HPGCL		-	140.00	154.00	210.00	504.00	
	Bagasse	PRIVATE	137.50	-	-	-	137.50	
	Bio Mass	PRIVATE	38.50	-	-	-	38.50	
Total Renewable			1016.00	2415.00	154.00	210.00	3795.00	
GRAND TOTAL			4997.85	7690.51	5251.96	1685.51	19625.83	

GoH Data

Category-wise Growth in consumers

Sl. No.	Consumers	Year-wise figures from FY 2009-10 to FY 2013-14				
		FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
(i)	Domestic	3512501	3684410	3849479	4020928	4136499
(ii)	Commercial	446024	462520	479366	502912	522110
(iii)	Industrial (LT)	74420	77199	79465	80851	82730
(iv)	Industrial (HT)	7535	8302	9356	10031	11109
(v)	Public Lighting	1255	1511	1593	1684	1878
(vi)	Traction	280	287	301	317	80
(vii)	Agriculture	491807	520391	540406	561381	582605
(viii)	Public Water Works & Sewage Pumping	15374	16047	16778	17684	18577
(ix)	Miscellaneous	11862	17255	19921	22439	25541
	Total	4561058	4787922	4996665	5218227	5381129

ANNEXURE-II**Census 2011 Data of Households in Haryana**

Description	Rural		Urban		Total	
	No.	(%)	No.	(%)	No.	(%)
No. of Households in Haryana	29,66,053	62.9	17,51,901	37.1	47,17,954	100
No. of Electrified Households	25,86,398	60.5	16,85,329	39.5	42,71,727	90.5
Balance Un-electrified Households	3,79,655	85.1	66,572	14.9	4,46,227	9.5

(Source: Census of India-2011)

Detailed Calculation of energy Demand in the State of Haryana up to FY 2018-19

Sl. No.	Particulars→ ↓	Calculation steps		Years			
				FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
A	DEMAND PROJECTIONS FOR ELECTRIFIED HOUSEHOLDS						
1	Consumption of Rural Electrified Households						
2	Consumption (units per day per household)	Units	2.5	2.7	3.0	3.3	
3	Annual Energy Requirement for existing electrified Rural Household	MUs	2,627	2,890	3,179	3,496	
4	Consumption of Urban Electrified Households						
5	Consumption (units per day per household)	Units	6.8	7.4	8.2	9.0	
6	Annual Energy Requirement for existing urban electrified Household	MUs	5,254	5,779	6,357	6,993	
7	Total Annual Energy Requirement for existing electrified households(A3+A6)	MUs	7,881	8,669	9,536	10,489	
B	ADDITIONAL ENERGY REQUIREMENTS FOR ELECTRIFIED DOMESTIC CONSUMERS						
1	Additional Energy Required for Electrified Households (Annual projection (-) current Energy available MUs)	MUs	717	1,505	2,372	3,325	

C	ELECTRIFICATION OF UNELECTRIFIED HOUSEHOLDS (per year)					
	URBAN					
1	Unelectrified Household as on 31.03.2014	Nos.				
2	Electrification of unelectrified Household	Nos.	-	-	-	-
3	Cumulative Annual Energy Requirement for Electrification of unelectrified urban Household	MUs	-	-	-	-
	RURAL					
4	Unelectrified Households	Nos.				
5	Targeted Electrification of unelectrified					
6	Electrification of unelectrified Household	Nos.	71,300	71,300	71,300	71,300
7	Cumulative Annual Energy Requirement for Electrification of unelectrified rural Household	MUs	64	141	233	342
8	Total households electrified out of unelectrified	Nos.	71,300	71,300	71,300	71,300
9	Annual Energy Requirement for Electrification of unelectrified Household	MUs	64	141	233	342

D	ELECTRIFICATION OF NEWLY CONSTRUCTED HOUSEHOLDS (per year)					
	URBAN					
1	Total Household - Urban (nos.) 2014					
	Yearly Increase in Urban H/H	Nos	106,556	111,887	117,485	123,363
2	Yearly cumulative Increase in Urban H/H as per GoH	Nos.	1,06,556	2,18,442	3,35,927	4,59,290
3	Cumulative Annual Energy Requirement (MUs) for newly constructed Household - Urban	MUs	263	593	1,003	1,508
	RURAL					
4	Total Household Rural 2014					
	Yearly Increase in Rural H/H as per GoH	Nos.	61,149	62,318	63,509	64,723
5	Yearly cumulative Increase in Rural H/H as per GoH	Nos.	61,149	1,23,467	1,86,976	2,51,699
6	Annual Energy Requirement for newly constructed Household	MUs	55	122	204	302
7	Total newly constructed households	Nos.	1,67,705	3,41,910	5,22,904	7,10,990
8	Cumulative Annual Energy Requirement for newly constructed Household	MUs	318	715	1,207	1,810

E	ANNUAL ENERGY REQUIREMENTS					
1	Total Additional Annual Energy Requirement - Domestic Consumer	MUs	1,099	2,361	3,812	5,477
2	Current Energy Available - Total	MUs	32,878	32,878	32,878	32,878
3	Current Energy Available - Domestic	MUs	7,164	7,164	7,164	7,164
4	Total Domestic Annual Energy Requirement (Current + Projection)	MUs	8,263	9,525	10,976	12,641
5	Current Energy Available - Other than Domestic	MUs	25,714	25,714	25,714	25,714
6	Total Annual Energy Requirement - Other than Domestic Consumers (with 10% growth P.A.)	MUs	31,114	34,226	37,648	41,413
	Additional Energy Required for other than domestic Categories of Consumers (year wise)	MUs	2,829	3,111	3,423	3,765
7	Additional Energy Required for other than domestic (Cumulative)		5,400	8,511	11,934	15,699
8	Total Energy Requirements (all)	Nos.	39,377	43,751	48,624	54,054

ANNEXURE-IV

Break up & details of capacities existing & likely to be added year wise

Sl. No	Particulars	Location	FY2014 -15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	Remarks
A	STATE SECTOR PROJECTS (HPGCL)							
A.1	Panipat TPP :-	Haryana	1367.8	1367.8	1367.8	1367.8	1367.8	Unit 1 to 4 will be phased out after COD of 800MW supercritical unit during 2019-2020 (3rd quarter of 2019).
	Stage-I (U1-117.8 MW + U2-110 MW)							
	Stage-II(U3 -110 MW + U4-110MW)							
	Stage-III(U5-210MW)							
	Stage-IV (U6-210MW)							
	Stage-V (U7-250MW)							
	Stage-VI(U8-250MW)							
A.2	Rajiv Gandhi TPP (2 X 600MW)	Haryana	1200	1200	1200	1200	1200	
A.3	Deen Bandhu Chhotu Ram TPP (2 X 300MW)	Haryana	600	600	600	600	600	
A.4	WYC HEP, Yamuna Nagar & kakroi	Haryana	62.4	62.4	62.4	62.4	62.4	Kakroi 1 X 300KW unit is already phased out from 01.09.14
	Stage -I (U A-2 X 8MW, U B-2 X 8MW, U C - 2X8MW)							
	Stage-II (2 x 7.2MW)							
	Kakroi (1x0.3MW)(already phased out)							
A.5	Solar PV of HPGCL	Haryana	-	-	20	42	72	
	Sub Total (A)		3230.2	3230.2	3250.2	3272.2	3302.2	
B	PARTNERSHIP PROJECTS							
B.1	Bharkra Nagal Complex- BHPP -I (Left Bank), BHPP-II (Right Bank) GWL Kotla (5 X 108MW, 5 X 157MW, 1 x 27.99 MW, 2 x 24.2 MW, 1X 28.94 MW, 2 X 24.2 MW)	Punjab	470.25	470.25	470.25	470.25	470.25	
B.2	Dehar Power plant (6 x 165MW)	H.P	297.08	297.08	297.08	297.08	297.08	
B.3	Pong Power plant (6 x 66MW)	H.P	61.64	61.64	61.64	61.64	61.64	
	Sub Total (B)		828.97	828.97	828.97	828.97	828.97	
C	CENTRAL SECTOR ALLOCATION							
C1	NTPC							

Sl. No	Particulars	Location	FY2014 -15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	Remarks
C1.1	Singrauli STPP Stage-I (5x 200 MW) and	M.P	200	200	200	200	200	
C1.2	Stage-II (2 X 500MW)							
C1.3	Rihand STPP – I (2 x 500MW)	U.P	65	65	65	65	65	
C1.4	Rihand STPP –II (2 x 500MW)	U.P	57	57	57	57	57	
C1.5	Rihand STPP – III (1 x 500MW)	U.P	56	56	56	56	56	
C1.6	Feroze Gandhi Unchahar STPP-I (2X 210MW)	U.P	11	11	11	11	11	
C1.7	Feroze Gandhi Unchahar STPP-II (2X 210MW)	U.P	23.02	23.02	23.02	23.02	23.02	
C1.8	Feroze Gandhi Unchahar STPP-III (2X 210MW)	U.P	11.99	11.99	11.99	11.99	11.99	
C1.9	Farakka – (Stage-I 3 X 200 MW & stage-II 2 x 500MW)	W.B	11.04	11.04	11.04	11.04	11.04	
C1.10	Kahalgaoon – I (4 X 210 MW)	Bihar	25.54	25.54	25.54	25.54	25.54	
C1.11	Kahalgaoon – II (3 X500 MW)	Bihar	68.7	68.7	68.7	68.7	68.7	
C1.12	Anta Gas (GT 3 X 88.7MW & STG 1 X 153.2MW)	Rajasthan	24.03	24.03	24.03	24.03	24.03	
C1.13	Auriya Gas (GT 4 X 110MW & STG 2 X 106 MW)	U.P	39.01	39.01	39.01	39.01	39.01	
C1.14	Dadri Gas (GT 2 X 143MW & STG 1X 146 MW)	U.P	40.98	40.98	40.98	40.98	40.98	
C1.15	Faridabad Gas (GT 4 X 130.9MW & STG 2 X 154.51 MW)	Haryana	432	432	432	432	432	
C1.16	Koldam HEP (4 X 200MW)	H.P	-	45	45	45	45	COD Unit-I & II Nov2015, (Tentative Share)
								COD Unit-III Jan2016
C1.17	Unchahar IV (1 X 500MW)	U.P	-	-	30.83	30.83	30.83	COD NOV 2016
C1.18	North Karanpura ER (Jharkhand)- 3 X 660MW	Jharkhand	-	-	-	-	-	COD 2021-22
C1.19	Tanda Stage II (2X660)	U.P	-	-	-	-	75.37	
C1.20	Tapovan Vishnugarh Hydro (520MW)	Uttarakhand	-	-	-	-	30	
	Total (NTPC)		1065.31	1110.31	1141.14	1141.14	1246.51	
C2	Others							
C2.1	Koderma TPP DVC (2 X 500MW)	Jharkhand	100	100	100	100	100	COD Unit-1 18.07.2013

Sl. No	Particulars	Location	FY2014 -15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	Remarks
								Unit-II Dec 2014 (10% share)
C2.2	Mejia B TPS DVC (2 X 500MW)	W.B	100	100	100	100	100	
C2.3	Raghunathpur TPP phase-I (DVC 2 X 600MW)	W.B	-	100	100	100	100	COD Unit-1 Nov. 2015 Unit-II Jan.2016
C2.4	Pragati gas Power station (Delhi) – (Stage I - 685.6 MW + stage-II 685.6MW)	Delhi	137.12	137.12	137.12	137.12	137.12	
C2.5	Tala HEP (1020 MW)	Bhutan	14.99	14.99	14.99	14.99	14.99	
C2.6	Tehri PSP (Uttranchal)- HEP 4 X 250MW	Uttarakhand	-		100	100	100	COD 16th NOV 2016
C2.7	Kishanganga (J & K) 330 MW HEP	J & K	-		19	19	19	COD 16th NOV 2016
C2.8	Pakal Dul HEP (J & K) 1000 MW	J & K		57	57	57	57	COD 16th NOV 2016
C2.9	Vishnugarh Piplakoti (uttarkhand) HEP – 444MW	Uttarkhand	-	-			18.4	COD 18th NOV 2018
C2.10	Kotli bhel (all 3 stages) – Uttranchal-HEP	Uttarkhand	-	-	58	58	58	COD 16th NOV 2016
C2.11	Siang Middle HEP (AP)-1000MW	Arunachal Pradesh	-	-	17	17	17	COD 16th NOV 2016
C2.12	Kemang HEP (AP) 600MW	Arunachal Pradesh	-	-	13	13	13	COD 16th NOV 2016
	Total (Others)		352.11	509.11	716.11	716.11	734.51	
C3	NHPC							
C3.1	Baira Suil HEP (3 X66MW)	H.P	60.39	60.39	60.39	60.39	60.39	
C3.2	Salal HEP stage-I (3 X 115 MW) & stage-II (3 X 115 MW)	J & K	103.64	103.64	103.64	103.64	103.64	
C3.3	Tanakpur HEP (3 X 31.4)	Uttarkhand	6.03	6.03	6.03	6.03	6.03	
C3.4	Chamera HEP (3 x 180MW)	H.P	85.32	85.32	85.32	85.32	85.32	
C3.5	Chamera HEP –III (3 x 77MW)	H.P	12.43	12.43	12.43	12.43	12.43	
C3.6	Chamera HEP- II (3 x 100MW)	H.P	17.01	17.01	17.01	17.01	17.01	
C3.7	Uri-I HEP (4 X 120MW)	J & K	26.02	26.02	26.02	26.02	26.02	
C3.8	Uri-II HEP(4 X 60MW), J & K	J & K	13.37	13.37	13.37	13.37	13.37	
C3.9	Dhaul ganga HEP (4 X 70MW)	Uttarkhand	15.99	15.99	15.99	15.99	15.99	
C3.10	Dhulhasti HEP (3 X 130MW)	J & K	21.33	21.33	21.33	21.33	21.33	
C3.11	Parbati III HEP (4 X 130MW)	H.P	50.08	50.08	50.08	50.08	50.08	
C3.12	Parbati II HEP (4 X 200MW)	H.P			45	45	45	COD NOV 2016

Sl. No	Particulars	Location	FY2014 -15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	Remarks
C3.13	SEWA – II HEP (3 X 40MW)	H.P	7	7	7	7	7	
C3.14	Subansari ER NHPC (Arunachal Pradesh) 2000MW- HEP	Arunachal Pradesh	-	-	-	43	43	COD 1st August 2017
	Total (NHPC)		418.61	418.61	463.61	506.61	506.61	
C4	THDC (Tehri Hydel)							
C4.1	THDC (4 X 250MW)	U.P	43	43	43	43	43	
C4.2	Koteshwar-THDC (4 X 100MW)	U.P	16.84	16.84	16.84	16.84	16.84	
	Total THDC		59.84	59.84	59.84	59.84	59.84	
C5	NPS							
C5.1	Narora APS (2 X 220MW)	U.P	27.98	27.98	27.98	27.98	27.98	
C5.2	RAPP Stage 3 & 4 (2 X 220 MW)	Rajsthan	48	48	48	48	48	
C5.3	RAPP Stage 5& 6 (2 X 220 MW)	Rajsthan	24.95	24.95	24.95	24.95	24.95	
C5.4	RAPP Stage 7& 8 (2 X 700MW)	Rajsthan	-	-	-	-	44	
	Total NPS		100.93	100.93	100.93	100.93	144.93	
C6	Other HEP							
C6.1	NJPC HEP (SJVNL) (6 X 250MW)	H.P	64.05	64.05	64.05	64.05	64.05	
C6.2	Rampur HEP of H.P. (6 X 68.67 MW)	H.P	17.02	17.02	17.02	17.02	17.02	COD Unit 1 & 2=13.5.2014, #3=8.8.2014, #4=18.6.2014 #5=13.5.2014, #6= 16.12.2014 Unit III, IV & V- Sept 2014 (8.54MW)
	Total (other HEP)		81.07	81.07	81.07	81.07	81.07	
	Sub Total C (Central Sector)		2077.87	2279.87	2562.7	2605.7	2773.47	
D	IPPs PROJECT & PURCHASES							
D.1	Amarkantak IPP (2 X 300MW) through PTC	M.P	195	195	195	195	195	Case under Dispute Not considered for generation & Demand
D.2	MG STPS (2 X 660MW) case-2	Haryana	1188	1188	1188	1188	1188	
D.3	Mundra UMPP (5 x 800MW)	Gujarat	400	400	400	400	400	
D.4	Adani IPP (Gujarat 3 x 660MW) Case-1	Gujarat	1424	1424	1424	1424	1424	
D.5	Sasan UMPP (6 x 660MW)	M.P	445.5	445.5	445.5	445.5	445.5	COD Unit 127.5.2014 ,#2=28.1.2014,#3=31.3.2013

Sl. No	Particulars	Location	FY2014 -15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	Remarks
								#4=12.4.2014 #5=26.12.2014,#6= 27.3.2015
D.6	IG STPS (Aravali 3 X 500MW)	Haryana	693	693	693	693	693	HPGCL equity 25%
D.7	Baglihar (3 X 150MW)- PTC J & K	Haryana	50	50	50	50	50	
D.8	Bhouka HEP Yamunanager (4 X 1.5MW)	Haryana	6	6	6	6	6	
D.9	P & R Gogripur SHP Kamal (2 X 1.0MW)	Haryana	2	2	2	2	2	
D.10	Puri oil mill, MHEP, Kamal (2 x 1.4MW)	Haryana	2.8	2.8	2.8	2.8	2.8	
D.11	PTC GMR Thermal	Odisha	300	300	300	300	300	
D.12	Jay Prakash Karcham wangtoo HEP	H.P	200	200	200	200	200	
D.13	Tipaimukh HEP- 1500MW	Manipur	-	-	40	40	40	
D.14	Teesta III Sikkim HEP 6 X 200MW	Sikkim	-	-	-	200	200	COD 1st Aug 2017
	Sub Total D (IPP Projects)		4906.3	4906.3	4946.3	5146.3	5146.3	
E	Renewable Energy Sources (Biomass & Solar PV)							
E.1	Solar PV Projects	Haryana	12.8	12.8	12.8	12.8	12.8	NTPC 5MW (2013-14)solar project not considered as they have not signed any PPA with Discoms.Maruti Udoyag 1 MW spv plant not considered since it is used for captive use
E.2	Solar PV (through NIT Route)	Haryana	-	-	175	175	175	
E.3	Solar PV plant by SECI 120MW	Haryana	-	120	120	120	120	PSA with SECI
	Solar PV through NTPC	Haryana			150	150	150	
E4	GEMCO Biomass based Generation project (8MW + 7MW)	Haryana	8	15	15	15	15	8 MW running and COD of 7MW by Dec 2015l
E.5	Starwire Biomass Projects (1 X 9.9MW)	Haryana	9.9	9.9	9.9	9.9	9.9	
E.6	Sri Jyoti Biomass energy ltd (9.5MW), Bhiwani	Haryana	9.5	9.5	9.5	9.5	9.5	COD 1st OCT 2014
E.7	A. B Grains biomass, Ambala	Haryana	5	5	5	5	5	COD 1st OCT 2014
E.8	Sugar Mills (Bagaase based)	Haryana	36	36	36	36	36	
E.9	Bagasse (Naraingarh Sugar mill) 25 MW Ambala	Haryana	-	25	25	25	25	COD Nov 2015
	Total E (RES)		81.2	233.2	558.2	558.2	558.2	
	Grand Total Availability at 100 %		11124.54	11478.54	12146.37	12411.37	12609.14	

ANNEXURE-V**LIST OF 220KV S/STNS HVPNL as on 31.07.2015**

Sl. No.	Name of Sub station	220/132	45/60	220/66	220/33	Total installed capacity in MVA
I	PANCHKULA					
1	Madanpur	-		3x100	-	300
II	Ambala					
2	Raiwali			2X100		200
3	Dhulkot(BBMB)	-		2x45/60	-	120
4	Tepla	-		3x100	-	300
III	YAMUNANAGAR					
5	Khera(BBMB)	-		2x45/60	-	120
6	Yamuna Nagar(Jorian)			3x100	-	300
7	Rampur Kamboyan			1X100	1X100	200
IV	KURUKUSHETRA					
8	KKTRA.(BBMB)	2x50		-	-	190
		2x45		-	-	
9	Pehowa	3x100		-	-	300
10	Shahbad	-		2x100	-	200
11	Salempur			2x100		200
12	Durala	2x100				200
V	KAITHAL					
13	Kaithal	3x100		-	-	300
14	Cheeka	3x100				300
15	Kaul	2x100				200
16	Batta	1x100			1x100	200
VI	KARNAL					
17	Mund	1x100				100
18	Karnal	2x100		-	-	300
		2x50		-	-	
19	Nissing	2x100		-	-	250
		1X50		-	-	
20	Unispur (Nilokheri)	2x100				200
21	Bastra	2x100				200
VII	PANIPAT					

Sl. No.	Name of Sub station	220/132	45/60	220/66	220/33	Total installed capacity in MVA
22	TDLTPS Panipat	2x100		-	-	200
23	Samalkha	2x100				200
24	Chhajpur	2x100				200
VIII	Sonepat					
25	Narela(BBMB)	1X100		-	-	150
		1x50				
26	Sonepat	3x100		-	-	300
27	Mohana	1x100			1X100	200
IX	JIND					
28	Narwana	3x100		-	-	300
29	Safidon	2x100				200
30	Jind	3x100				300
X	Rohtak					
31	Rohtak	4x100		-	-	400
32	Sampla	2x100				200
XI	FARIDABAD					
33	Ballabgarh (BBMB)	-		3x100	-	300
34	Palla	-		3x100	-	300
35	Palli			2x100		200
36	A/5 Faridabad			2x100		200
37	A/4 Faridabad			2x100		200
XII	MEWAT					
38	Rangala Rajpur			1X100	1X100	200
XIII	PALWAL					
39	Palwal	-		2x100	-	200
XIV	GURGAON					
40	Delhi(BBMB)	-		1x100	1X100	200
41	Badshahpur	-		4x100	-	400
42	Sector 52-A Gurgaon			3x100		300
43	IMT Manesar			2x100		200
44	Daultabad			4x100		400
45	Sector 56 Gurgaon			2x100		200
46	Sector 72 Gurgaon			2x100	1x100	300
XV	MOHINDERGARH					

Sl. No.	Name of Sub station	220/132	45/60	220/66	220/33	Total installed capacity in MVA
47	Narnaul	2x100		-	-	200
48	Mohindergarh	2x100		-	-	200
49	Dhanonda	1x100			1x100	200
XVI	REWARI					
50	Rewari	3x100		-	-	300
51	Lula Ahir	1x100			1x100	200
52	Mau			2x100	1x100	300
XVII	SIRSA					
53	Sirsa	2x100		-	-	200
54	Rania	2x100				200
55	Chormar	1x100			1x100	200
XVIII	BHIWANI					
56	Bhiwani	3x100		-	-	300
57	Dadri(BBMB)	2x100		-	-	200
58	Isherwal	1x100				100
59	Dadhi Bhana	1x100			1X100	200
60	Sagwan	1X100			1X100	200
XIX	HISAR					
61	Hisar(BBMB)	2x100		-	-	200
62	Hisar I.A.	1x100		-	-	150
		1x50				
63	Masudpur	2x100				200
64	Samain	1X100			1X100	200
XX	FATEHABAD					
65	Fatehabad	3x100				300
66	Bhuna	2x100				200
XXI	Jhajjar					
67	Bahadurgarh	3x100				300
68	Bhadana	2X100				200
	TOTAL					15680
	220 kV Capacity at 400 kV substations					
1	Panipat BBMB				1x60	260
2	Nawada			2x100	1x100	300
3	Kirori	2x100				200

Sl. No.	Name of Sub station	220/132	45/60	220/66	220/33	Total installed capacity in MVA
4	Deepalpur	2x100				200
5	Kaboolpur	2x100				200
6	Nuhiyanwali	2x100				200
						1360
	Total Installed Capacity					17040

Existing 220 KV lines as on 31.07.2015

Sl. No.	Name of Line	No. of Ckts.	Length (Ckt Kms)
1.	Kunihar-Panchkula	D/C	124
2.	Sewah-PTPS	2xD/C	46
3.	PTPS-Karnal	S/C	48.2
4.	PTPS-Narwana	D/C	152
5.	Narwana-Hisar	S/C	72
6.	Narwana-Kaithal	D/C	64
7.	Narwana-Sirsa	S/C	107
8.	Kaithal-Pehowa	D/C	70
9.	Pehowa-Shahbad	D/C	70.6
10.	Dadri-Narnaul	S/C	63.8
11.	Dadri-Rewari	S/C	59
12.	Bhiwani(400KVS/Stn.)-Bhiwani(220KVS/Stn.)	D/C	13.6
13.	Samaypur-Badshahpur	D/C	47
14.	Samaypur-Palwal	D/C	44
15.	Samaypur-Pali D/C line (Only One Ckt commissioned)	D/C	9.32
16.	Palli-Palla D/C line (Only one Ckt commissioned)	S/C on D/C Towers	12.46
17.	LILO of Hisar-Narwana line at Hisar I.A	S/C	1.5
18.	P.T.P.P-Nissing.	D/C	80
19.	Nissing- Kaithal	D/C	69.72
20.	Badshahpur-Rewari	S/C on D/C Towers	50.17
21.	PTPS-Rohtak	D/C	126.1
22.	PTPS- Sonapat	S/C on D/C Towers	50.44
23.	Abdullapur-Y.Nagar-Shahbad	D/C	89.92
24.	Panchkula-Shahbad	D/C	134.22
25.	LILO of Dadri-Narnaul line at Mohindergarh	S/C	0.6
26.	LILO of Nareana-Sirsa line at Fatehabad	S/C	10.44
27.	Dadri - Mohindergarh	S/C	41
28.	Hisar (400 kV) - Fatehabad, 220 kV D/C line.	S/C on D/C Towers	129.944

Sl. No.	Name of Line	No. of Ckts.	Length (Ckt Kms)
29.	Kaithal (220 KV) - Cheeka (220 KV) S/C line on D/C towers with 0.4 Sq." ACSR	S/C on D/C Towers	40
30.	LILO from Panchkula-Shahbad D/C line at Tepla	D/C	2.34
31.	220 kV Fatehabad-Rania S/C line on D/C Tower	S/C on D/C Towers	60.77
32.	220 kV Pali-Badshahpur D/C line	D/C	45.49
33.	LILO of 220 kV D/C PTPS-Nareana line at Safidon	D/C	16
34.	220 kV D/C line from PTPS to Jind 220 kV substation	D/C	134
35.	220 kV D/C line from Pali to Sec-52 A Gurgaon 220 kV substation	D/C	44
36.	PTPSPanipat - Safidon 220 kV D/C line with 0.5 sq" ACSR	D/C	74
37.	220 kV D/C Abdullapur - Tepla line.	D/C	59.69
38.	220 kV D/C Jind - Hisar line	D/C	122
39.	Badshahpur - IMTManesar S/C line on D/C towers	D/C	11.72
40.	2nd circuit of TDLTPS - Sonapat D/C line.	D/C	50.44
41.	2nd circuit of 220 kV Kaithal - Cheeka line from 400 kV substation Kaithal to 220 kV Kaithal	D/C	14.18
42.	220 kV D/C Bahadurgarh-Rohtak	D/C	93
43.	220 kV D/C Jind-Safidon	D/C	90
44.	Daultabad - IMTManesar 220 kV D/C line	D/C	36
45.	Bahadurgarh (400 KvPGCIL) - Bahadurgarh(NunaMajra) (220 kV) D/C line	D/C	6
46.	Nissing - Salempur 220 kV D/C line	D/C	84
47.	2nd circuit of 220 kV Kaithal-Cheeka line from 400 kV PGCIL substation Kaithal to 220 kV Cheeka		37.06
48.	LILO of 220 kV D/C Badshahpur - Rewari line at 400 kV Bhiwadi	D/C	42
49.	2nd Circuit for TL No.127 of 220Kv Hisar-Narwana line to shift to Hisar-Sangrur line (Ckt-II)	S/C	1.5
50.	2nd circuit of 220Kv BBMB-IA Hisar line	S/C	1.543
51.	220Kv D/C YTPP-Jorian (Yamunanagar) line	D/C	21.8
52.	220Kv D/C YTPP-Salempur line (Ckt.-I)	S/C	39.408
53.	Construction of Nilokheri - Karnal 220 kV S/C line	S/C	19.475
54.	LILO of 220 kV Narwana - Fatehabad S/C line at 220 kV substation Bhuna	D/C	15.984
55.	LILO of one Ckt. of 220KV D/C Shahbad-Pehowa line at Durala – 2.812 Km Loc. -16	D/C	5.624
56.	LILO of 220 kV Fatehabad - Sirsa S/C line at 400 kV substation Fatehabad	D/C	5.484
57.	LILO of 220 kV Fatehabad - Narwana S/C line at 400 kV substation Fatehabad	D/C	
58.	220 kV Mayyar - Isherwal line (2nd ckt)	S/C	45.59

Sl. No.	Name of Line	No. of Ckts.	Length (Ckt Kms)
59.	2nd ckt of 220 kV Badshahpur - Rewari line via Bhiwadi. i) Badshahpur - Bhiwadi. ii) Bhiwadi - Rewari	S/C	51.153
60.	220 kV D/C link line between DCRTTP and 400 kV substation Abdullapur has been charged	D/C	55.954
61.	220 kV D/C Kirori - Bhuna line	D/C	60
62.	Loop in of 220KV Jind-IA Hisar line at 220KV substation Masudpur to make IA Hisar-Masudpur D/C line	S/C	3.5
63.	220Kv D/C Kirori-Masudpur line	D/C	47.624
64.	220 kV T-off line from 220 kV Dadri-Rewari line to IGSTPSJharli (Jhajjar)	S/C	3
65.	LILO of 220Kv D/C Pali-Sector 52A line at 220Kv substation Sector 56 (2 nd Circuit)	D/C	0.3
66.	220kV D/C Cheeka-Durala line	D/C	99.776
67.	LILO of 220kV PTPP-Safidon line Ckt. No.II at 220kV substation Bastra		53.05
68.	220 kV D/C Bastara - Kaul line	D/C	112.29
69.	220 kV D/C Pehowa - Kaul line	D/C	26
70.	220 kV D/C DCRTTP - Nilokheri line	D/C	104
71.	220kV D/C Jaijy-Mohana line	D/C	3.428
72.	220kV D/C Mohana- Samalkha line	D/C	55.744
73.	220kV D/C Sampla – Mohana line	D/C	69.4
74.	220kV D/C Samalkha – Chhajpur line	D/C	50.044
75.	LILO of one circuit of 220kV S/C Dadri –Rewari line at proposed 220kV substation Lula Ahir	S/C	3
76.	One circuit of 220kV D/C Sector-72 to 220kV substation Sector-52A, Gurgaon line	D/C	23
77.	220kV D/C line from 400kV proposed PGCIL Sector-72 to 220kV substation Sector-72, Gurgaon(Ckt. 1&2)	D/C	0.8
78.	LILO of 220 kV Badshahpur-Bhiwadi line at 220kV substation Mau	D/C	3
79.	220 KV D/C Fatehabad – Chormar line	D/C	158.16
80.	LILO of 2 nd Ckt. of 220kV Kaithal- Narwana at 220kV substation Batta	D/C	1.8
81.	220 kV D/C Dhanonda-DadhiBana	D/C	34.74
82.	220kV D/C Rania-Chormar line via Nuhiyawali	D/C	72.46
83.	LILO of 220kV D/C PGCILMayyar-Isherwal line at 220kV substation Sagwan	D/C	69.6
84.	S&S of 2 nd CKT of 220kV Badshahpur-Rewari line at PGCILBhiwadi	D/C	20.42
85.	220kV D/C Mau-Daultabad line	D/C	76

Sl. No.	Name of Line	No. of Ckts.	Length (Ckt Kms)
86.	LILO of 220kV D/C Rohtak-Bahadurgarh line at 220kV substation Sampla	D/C	97.88
87.	220kV D/C line from 220kV Sector-72 to 220kV substation Sector-56 Gurgaon	D/C	42
88.	LILO of 220 kV D/C Pali-Sector-52 A line at 220 kV substation Sector 56 Gurgaon	D/C	1.6
89.	LILO of 220kV D/C line from 220 kV Sector-72 to proposed 220kV substation Sector-52A Gurgaon at Sector 57 Gurgaon	D/C	0.8
90.	220 kV Bbadshapur-ManaserCkt.-II	S/C	11.6
91.	220kV D/C line from 400kV substation Kirori to 220kV substation Samain	D/C	70
92.	220 kV Dhanonda-Lula Ahir line Ckt-I	D/C	18.2
93.	LILO of both circuits of 200 kV PGCILMayyar-Isharwal line at 220 kV Sagwan.	D/C	34.8
94.	LILO of one circuit of 220kV DCRTTP - Abdullapur line at 220 kV substation Rampur Kamboyan S/C Dadri -Rewari line at proposed 220kV substation Lula Ahir	S/C	19.088
95.	LILO of 220 kV D/C Tepla-Madanpur line at 220 kV substation Raiwali	D/C	7.6
96.	220 kV D/C Palwal-RangalaRajpur	D/C	105.4
97.	220 kV Dhanonda-Lula Ahir line Ckt-I	D/C	18.2
98.	Deepalpur -Barhi-Sonepat Ckt.1 &2	D/C	77
99.	LILO of one Ckt. Of PTPS-Sonepat at 400 kV Deepalpurenrout purposed 220 kV Barhi	S/C	21.24
100.	220kV D/C line from 400kV PGCIL-Naggal to 220kV substation Raiwali	D/C	25.6
101.	LILO of one ckt. Of 220 kV Rohatak -Sampla line at Kabulpur	S/C	23.05
102.	Lilo of 220 kV D/C Narwana-Safidon line at 220 kV S/StnMund	D/C	10.258
103.	220 kV D/C line from 400 kV Kabalpur to 220 kV Bhadana	D/C	47.144
104.	220 kV D/C Sector-72 -Sector-20 Gorgaon line	D/C	48
105.	LILO of 220 kV D/C Badshapur-Bhiwari-Mau line at 400 kV Panchgaon	D/C	6.4
106.	LILO of one ckt. Of 220 kV D/C Badshapur-Mau-Bhiwari line at HSIIDCBawal.	S/C	39.15
107.	220 kV D/C Sector-72(PGCIL)-Sector 72(HVPN) Ckt. 3&4	D/C	0.8
108.	220 kV D/C Sector-72(PGCIL)-Sector-33(HVPNL) Ckt. 1&2	D/C	8.8
109.	220 Kv d/c Masudpur- Samain line	D/C	91.26
			5090.245

List of 400 kV and above Substations of HVPNL & BBMB

Sl. No.	Name of Substation	Capacity 400/220 kV (MVA)	Total capacity 400/220 kV (MVA)
A	BBMB		
	Existing		
1	Sewah (Panipat)	2(3x150)	900
2	Bhiwani	1x500	500
			1400
B	HVPNL		
	Existing		
1	Dhanonda	3x315	945
2	Kaboolpur	2x315	630
3	Deepalpur	2x315	630
4	Daultabad	3x315	945
5	Kirori	3x315	945
6	Nuhiyanwali	2x315	630
7	Nawada	2x315	630
			5355
Total :			6755

Existing 400 kV Lines as on 31.07.15

Sl. No.	Name of Line	No. of Circuits	Length (Ckt Kms)
1.	400Kv RGTPPKhedhar-PGCILMatana (Fatehabad) line	D/C	80
2.	400Kv RGTPPKhedhar-Kirori line	D/C	13
3.	1 st circuit of 400kV RGTPPKhedhar-PGCILMatana (Fatehabad) line		40
4.	400kV IGSTPPJhajjar-Daultabad line	D/C	128.588
5.	LILO of 1st Ckt. Of 400 kV D/C Jhajjar (IGSTPP)-Daultabad line at CLP(MGSTP) Jharli.	S/C	5.15
6.	LILO of one circuit of 400 KV HisarTPS – Fatehabad (PGCIL) line at 400 KV Substation, Nuhiyawali	S/C	152.864
7.	400kV D/C line from MGSTPP (Jhajjar-2)-Dhanonda	D/C	41.6
8.	400kV D/C Line from MGTPPJhajjar to 400kV Substation Kabulpur	D/C	205
9.	400 kV D/C Line from 400kV SubstationKabulpur (Rohtak) to 400kV Substation Deepalpur (Sonepat)	D/C	
10.	LILO of one circuit of 400kV Abdullapur - Bawana Line at 400KV Substation Deepalpur (Sonepat)	S/C	
11.	LILO of 400kV Samaypur - Greater Noida Line at 400KV Substation Nawada	D/C	1.4
12.	400 kV D/C line from Daultabad to Dhanonda line with Quad Moose conductor	D/C	154.9
13.	LILO of PTPS-Sonipat at Deepalpur(Circuit-I & Circuit-II commissioned on 9.3.2013)	LILO	49.82
14.	400 kV D/C Daultabad-Sector-72 Gurgoan Line	D/C	42.6
	Total Ckt. kM		914.922

ANNEXURE-VI**List of Planned Substations FY 2015-16**

Sl. No.	Name of substation	Capacity Addition (MVA)				Tentative Cost in Rs lac
		220 kV Level	132 kV level	66 kV level	Total	
	220 kV S/Stn					
1	220 kV substation Sonta	200		16	216	3000
2	220 kV substation Hukamawali	200			200	3000
3	220 kV substation HSIIDC Bawal	200			200	3000
4	220 kV substation Sector-57 Gurgaon (GIS)	200			200	5000
5	220 kV substation Panchgaon	420			420	4000
6	220 kV substation Sector-20 Gurgaon (GIS)	300		63	363	6000
7	220 kV substation HSIIDC Barhi	200			200	3000
8	220 kV substation RGECE Sonapat	200			200	3000
9	220 kV Sector-6 Sonapat	200			200	3000
	Total :	2120	0	79	2199	33000
	132 kV S/Stn					
1	132 kV substation IE Panipat (By HSIIDC)		20		20	1200
2	132 kV substation Khewra		50		50	1500
3	132 kV substation Bhattu sotter		50		50	1200
4	132 kV substation Makrani		25		25	1377
	Total :		145		145	5277
	66 kV S/Stn				0	
1	66 kV substation Laha			16	16	800
2	66 kV substation Majri			16	16	800
3	66 kV substation Sardaheri			32	32	1000
4	66 kV substation Pilkhani			32	32	1000
5	66 kV substation Sector 22 Panchkula (HSIDC) {GIS}			32	32	2500
6	66 kV substation Sector-20 Panchkula			63	63	1000
7	66 kV GIS substation in sector-4 Gurgaon .			63	63	1500
8	66 kV GIS substation in sector-34 & 35 Gurgaon by HSIIDC .			31.5	31.5	1500
9	66 kV substation Jamalpur			63	63	1500
10	66 kV S/Stn Mohmadpur Ahir			63	63	1500
	Total :			411.5	411.5	13100
	Grand Total	2120	145	490.5	2755.5	51377

List of planned Substations FY 2016-17

Sl. No.	Name of substation	Capacity Addition (MVA)				Tentative Cost in Rs lac
		220 kV Level	132 kV level	66 kV level	Total	
	220 kV S/Stn					
1	220 kV substation Sector-32 Panchkula	200		63	263	3000
2	220 kV substation, Pinjore	200		16	216	3000
3	220 kV substation GIS sector-33 Gurgaon	320			320	6000
4	220 kV substation Roj-Ka-Meo	420			420	3600
5	220 kV substation Meerpur Kurali	200			200	3000
	Total :	1340	0	79	1419	18600
	132 kV S/Stn.					
1	132 kV sector-9 Jind		75		75	1000
	Total :		75		75	1000
	Grand Total :	1340	75	79	1494	19600

List of planned Substations FY 2017-18

Sl. No.	Name of substation	Capacity Addition (MVA)				Tentative Cost in Rs lac
	220 kVS/Stn	220 kV Level	132 kV level	66 kV level	Total	
1	220 kV S/Stn Bhojawas	200			200	5000
2	220 kV Sector-65 GIS	200			200	5000
3	220 kV Sector-77 GIS	200			200	5000
4	220 kV Sector-107 GIS	200			200	5000
5	220 kV Sector-69 GIS	200			200	5000
6	220 kV S/Stn Sector-84	200			200	5000
7	220 kV S/Stn Sector-46	320			320	5000
8	220 kV S/Stn Sector-58	320			320	5000
	Total :	1840			1840	40000
	132 kVS/Stn					
1	132 kV Bhojraj		100		100	2000
2	132 kV Hudina		100		100	2300
3	132 kV substation Chandi		100		100	1200
4	132 kV substation Garhi Bolni		75		75	1000
	Total :		375		375	6500
	66 kVS/Stn					
1	66 kV S/Stn Mehra			32	32	1000
2	66 kV substation at phase-I, Udyog Vihar			63	63	1500
3	66 kV substation in sector-45 Gurgaon .			63	63	1500
4	66 kV substation Badrola			63	63	1200
5	66 kV substation Banchari/ Mundkati			32	32	1200
6	66 kV substation HUDA Shahbad			63	63	1200
7	66 kV S/Stn Sector-21D FBD			63	63	1200
8	66 kV S/Stn Sector-59 FBD			63	63	1200
9	66 kV S/Stn Suraj Kund			63	63	1200
	Total :			505	505	11200
	Grand Total :	1840	375	505	2720	57700

List of planned Substations FY 2018-19

Sl. No.	Name of substation	Capacity Addition (MVA)					Tentative Cost in Rs lac
	400 kV S/Stn	400 kV level	220 kV Level	132 kV level	66 kV level	Total	
1	400 kV Farakhnagar	630				630	15000
	Total :	630				630	15000
	220 kV S/Stn						
1	200 kV substation Pakasama		200			200	4000
2	220 kV substation Mehna Khera		300			300	3000
3	220 kV substation in Transport Hub Sector-8 IMT Manesar		200		16	216	4000
4	220 kV Neemwala		200	25		225	3000
5	220 kV substation Rai		200			200	3000
6	220 kV Berthala(KKR)		200			200	4000
7	220 kV Killa Zaffargarh		320			320	3500
8	220 kV Gignow		320			320	5000
9	220 kV Sector-85 GIS		200			200	5000
10	220 kV Sector-95 GIS		200			200	5000
11	220 kV S/Stn Sector-86		200			200	5000
	Total :		2540	25	16	2581	44500
	132 kV S/Stn						
1	132 kV substation Jattal			50		50	1500
	Total :			50		50	1500
	66 kV S/Stn						
1	66kV substation Prithla/ Gadpuri				63	63	1500
2	66 kV S/Stn Green field				63	63	1200
3	66 kV S/Stn Sector-37				63	63	1200
4	66 kV S/Stn Sector-23				63	63	1200
	Total :				252	252	5100
	Grand Total :	630	2540	75	268	3513	66100

List of planned Substations to be Augumented from FY 2015-16

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
	220 kV			
1	220 kV Rangala rajpur	100	650	2015-16
2	220 kV Substation Mau	100	650	2015-16
	Total :	200	1300	
	132 kV			
1	132 kV substation Bahu	34	350	2015-16
2	132 kV S/Stn Thana	25	360	2015-16
3	132 kV Madhuban	25	300	2015-16
4	132 kV substation Naultha	25	250	2015-16
5	132 kV substation Beholi	50	350	2015-16
6	132 kV Chhajpur	25	350	2015-16
7	132 kV substation Bega	50	350	2015-16
8	132 kV Murthal	25	350	2015-16
9	132 kV Ganaur	25	350	2015-16
10	132 kV substation Jhajjar	25	350	2015-16
11	132 kV Bhiwani	25	300	2015-16
12	132 kV Dadri II	25	300	2015-16
13	132 kV substation Dhudhyanwali	50	300	2015-16
14	132 kV S/Stn Ding	30	300	2015-16
15	132 kV substation Mattanhail	37.5	350	2015-16
16	132 kV Nilokheri	20	300	2015-16
17	132 kV Assandh	20	300	2015-16
18	132 kV Dablain	25	300	2015-16
19	132 kV substation Alewa	20	100	2015-16
20	132 kV Julana	25	150	2015-16
21	132 kV Garhi	20	100	2015-16
22	132 kV substation Kharkhoda	25	350	2015-16
23	132 kV Mundlana	25	350	2015-16
24	132 kV Harsana	25	70	2015-16
25	132 kV substation IMT Rohtak	43.5	350	2015-16
26	132 kV substation Sector-3, Rohtak.	25	200	2015-16
27	132 kV substation Kalanaur	25	200	2015-16
28	132 kV substation Meham	25	300	2015-16
29	132 kV Bahadurgarh	5	300	2015-16
30	132 kV substation Mattanhail	25	70	2015-16
31	132 kV substation Bahu	16	70	2015-16
32	132kV Arya Nagar	25	300	2015-16
33	132kV Substation Khedar	20	80	2015-16
34	132 kV substation Bhattu Kalan	25	300	2015-16
35	132 kV substation Uklana	9	80	2015-16
36	132 kV substation Haluwas	25	200	2015-16
37	132 kV substation I A Bhiwani	25	200	2015-16

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
38	132 kV Kairu	20	150	2015-16
39	132 kV Kairu	30	350	2015-16
40	132 kV substation Assa Khera	25	300	2015-16
41	132 kV S/Stn Shahpur Begu	20	200	2015-16
42	132 kV S/Stn Dabwali	25	250	2015-16
43	132 kV S/Stn Odhan	5	250	2015-16
44	132 kV S/Stn Jiwan Nagar	20	100	2015-16
45	132 kV substation Nangal Chaudhary	25	350	2015-16
46	132 kV substation Satnali	25	350	2015-16
47	132 kV Substation Bawal (Old)	25	250	2015-16
48	132 kV Buroli	25	250	2015-16
	Total :	1220	12380	
	66 kV			
1	66 kV substation Basantpura	15.5	310	2015-16
2	66 kV substation Gulab Nagar	15.5	275	2015-16
3	66 kV substation Chhachharauli	15.5	275	2015-16
4	66 kV substation Bilaspur	15.5	275	2015-16
5	66 kV substation Ladwa	15.5	200	2015-16
6	66 kV substation Sector-51	15.5	250	2015-16
7	66 kV Sector-2 IMT Manesar	15.5	250	2015-16
8	66 kV Farukhnagar	15.5	250	2015-16
9	66 kV Sector-10 A Gurgaon	15.5	250	2015-16
10	66 kV substation Nuh	15.5	250	2015-16
11	66 kV substation Taoru	15.5	250	2015-16
12	66 kV S/Stn FCI	15.5	250	2015-16
13	66 kV S/Stn Dabriwala	15.5	250	2015-16
14	66 kV S/Stn Ford	15.5	250	2015-16
15	66 kV S/Stn Sector-31	15.5	250	2015-16
16	66 kV Hasanpur	15.5	250	2015-16
17	66 kV substation Aurangabad	15.5	250	2015-16
18	66 kV substation Company Bag	16	75	2015-16
19	66 kV substation Barnala	16	75	2015-16
20	66 kV substation Barara	8	25	2015-16
21	66 kV substation Mustfabad	6	25	2015-16
22	66 kV substation Rattangarh	16	75	2015-16
23	66 kV substation Nalvi(kkr)	16	75	2015-16
24	66 kV substation sector-44, Gurgaon	20	300	2015-16
25	66 kV Sector-8 IMT Manaser	16	50	2015-16
26	66 kV Sector-34	20	50	2015-16
27	66 kV substation Nuh	10	200	2015-16
28	66 kV substation Punhana	16	50	2015-16
29	66 kV substation Nimoth	16	50	2015-16
30	66 kV substation Nagina	16	50	2015-16

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
31	66 kV S/Stn Idgah	19	250	2015-16
32	66 kV S/Stn Partap Steel	16	100	2015-16
33	66 kV S/Stn Sector-31	16	100	2015-16
34	66 kV S/Stn Bhopani	16	100	2015-16
35	66 kV Mandkola	16	100	2015-16
36	66 kV substation Allawalpur	16	100	2015-16
37	66 kV substation Hodal	16	100	2015-16
38	66kV substation Chandhut	16	100	2015-16
39	66kV substation Sector-2 Palwal	16	100	2015-16
	Total :	602.5	6485	
89	Grand Total :	2022.5	20165	

List of planned Substations to be Augmented from FY 2016-17

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
	400 kV			
1	400 kV Daultabad	315	1200	2016-17
2	400 kV S/Stn Nawada	315	1200	2016-17
	Total :	630	2400	
	220 kV			
1	400 kV S/Stn Nawada	100	650	2016-17
2	220 kV Dadibana	100	650	2016-17
3	220 kV substation Sector-IMT Manaser	60	750	2016-17
4	220 kV substation Jorian	60	650	2016-17
5	220 kV Nuna Majra	100	650	2016-17
6	220 KV Unisipur	160	650	2016-17
7	220 kV Chhajpur	100	650	2016-17
8	220 kV Batta	100	500	2016-17
9	220 kV Bastara	100	650	2016-17
10	220 kV Palwal	100	650	2016-17
11	220 kV substation Sector-72 Gurgaon	100	650	2016-17
12	220 kV Chormar(HOT)	100	650	2016-17
13	220 kV Isharwal	100	650	2016-17
14	220 kV Dadibana	100	650	2016-17
15	220 kV substation Safidon	100	500	2016-17
16	220 kV substation Mohana	100	650	2016-17
17	220 kV substation Rampur Kamboyan	100	650	2016-17
18	220 kV substation Dhanonda	100	650	2016-17
19	220 kV S/Stn Palli	60	750	2016-17
20	220 kV substation Rampur Kamboyan(Hot Transformer)	100	650	2016-17

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
21	220 kV Karnal	50	650	2016-17
22	220 kV substation Bhuna	100	100	2016-17
23	220 kV Substation Lulu Ahir	100	650	2016-17
24	220 kV substation HSIIDC Bawal	100	650	2016-17
25	220 kV substation Sector-56 Gurgaon	200	1600	2016-17
26	220 kV substation Sector-72 Gurgaon(Hot)	100	650	2016-17
27	220 kV GIS S/Stn A-4	200	1600	2016-17
	Total :	2790	18800	
	132 kV			
1	220 kV substation Safidon	25	300	2016-17
2	220 kV Samalkha	25	350	2016-17
3	220 kV Sangwan	50	300	2016-17
4	220 kV substation Rania	8	200	2016-17
5	220 kV Sirsa	25	300	2016-17
6	132 kV Tajpur	25	350	2016-17
7	132 kV S/Stn Chakuldana	25	360	2016-17
8	132 kV S/Stn Noutch	25	360	2016-17
9	132 kV S/Stn Kheri Gulam Ali	25	360	2016-17
10	132 kV Bhadson	16	100	2016-17
11	132 kV Karnal	25	360	2016-17
12	132 kV Newal	20	100	2016-17
13	132 kV Gharaunda	25	360	2016-17
14	132 kV IE Panipat	50	350	2016-17
15	132 kV IE Chandoli	25	350	2016-17
16	132 kV Dhanauri	16	100	2016-17
17	132 kV substation HSIIDC Rohatak	25	300	2016-17
18	132 kV substation MDU Rohatak	25	300	2016-17
19	132 kV substation Behal	25	400	2016-17
20	132 kV substation Behal	16	50	2016-17
21	132kV Substation Barsi (BHIWANI)	25	300	2016-17
22	132 kV substation Kariwala	9	250	2016-17
23	132 kV S/Stn Madho Singhana	25	300	2016-17
24	132 kV substation Mundia Khera	25	50	2016-17
25	132 kV substation Seka	25	350	2016-17
26	132 kV Pali Gothra	25	250	2016-17
27	132 kV Buroli	25	250	2016-17
	Total :	660	7400	
	66 kV			
1	220 kV substation Jorian	16	250	2016-17
2	220 kV Palwal	15.5	250	2016-17
3	220 kV substation Shahbad	6	25	2016-17

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
4	220 kV substation Sector 52A	23	600	2016-17
5	220 kV substation Daultabad	15.5	250	2016-17
6	220 kV S/Stn Palli	16	100	2016-17
7	66 kV substation Govindpuri	15.5	250	2016-17
8	66 kV substation Mehrauli Road	15.5	250	2016-17
9	66 kV S/Stn Idgah	15.5	250	2016-17
10	66 kV S/Stn Sector-64,Ballabgarh	15.5	250	2016-17
11	66 kV S/Stn Chhainsa	15.5	250	2016-17
12	66 kV S/Stn Escort-1	15.5	250	2016-17
13	66 kV S/Stn A-2	15.5	250	2016-17
14	66 kV S/Stn Escort-II	15.5	250	2016-17
15	66 kV S/Stn Oswal Steel Faridabad	31.5	250	2016-17
16	66 kV S/Stn Hyderabad	31.5	250	2016-17
17	66 kV S/Stn Jharsetly	31.5	250	2016-17
18	66 kV S/Stn Globel Steel	3.5	20	2016-17
19	66 kV S/Stn Fatehpur Billoch	16	100	2016-17
20	66 kV S/Stn USA	15.5	250	2016-17
21	66 kV S/Stn Ford	15.5	250	2016-17
	Total :	361	4845	
77	Grand Total :	4441	33445	

List of planned Substations to be Augmented from FY 2017-18

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
	400 kV			
1	400 kV Kaboolpur	315	1200	2017-18
	Total :	315	1200	
	220 kV			
1	400 kV Nuhiyanwali	100	650	2017-18
2	220 kV Raiwali	100	650	2017-18
3	220 kV Kaithal	60	600	2017-18
4	220 KV Durala	100	650	2017-18
5	220 kV Nissing	60	650	2017-18
6	220 kV Samalkha	160	750	2017-18
7	220 kV substation Narwana	60	650	2017-18
8	220 kV substation Jind	60	650	2017-18
9	220 kV substation Mohana	100	650	2017-18
10	220 kV Masudpur	100	100	2017-18
11	220 kV Masudpur	100	650	2017-18
12	220 kV substation Hukamawali	160	650	2017-18

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
13	220 kV substation Hukamawali	100	650	2017-18
14	220 kV S/Stn. Sangwan	100	650	2017-18
15	220 kV Chormar	100	650	2017-18
16	220 kV Mehna khera	100	650	2017-18
17	220 kV substation 52 Gurgaon	160	750	2017-18
18	220 kV substation Sector-56 Gurgaon	60	750	2017-18
19	220 kV Rangala rajpur	100	100	2017-18
20	220 kV A-5 Faridabad	60	750	2017-18
	Total :	1940	12250	
	132 kV S/Stn			
1	220 KV Neemwala	25	50	2017-18
2	220 kV Mund	50	360	2017-18
3	220 kV Chhajpur	25	70	2017-18
4	220 kV Samalkha	25	350	2017-18
5	220 kV Samalkha	30	350	2017-18
6	220 kV IA Hisar	50	100	2017-18
7	220 kV IA Hisar	25	70	2017-18
8	220 kV substation Bhuna	25	70	2017-18
9	220 kV substation Narnaul	50	350	2017-18
10	220 kV substation Mohendergarh	25	70	2017-18
11	132 kV S/Stn Cheeka	25	360	2017-18
12	132 kV S/Stn Siwan	30	360	2017-18
13	132 kV S/Stn Bhagal	25	360	2017-18
14	132 kV S/Stn Chakuldana	25	360	2017-18
15	132 kV S/Stn Rajound	25	100	2017-18
16	132 kV S/Stn Pai	25	360	2017-18
17	132 kV S/Stn Pundri	25	360	2017-18
18	132 kV S/Stn Pundri	25	360	2017-18
19	132 kV S/Stn Kaithal	25	360	2017-18
20	132 kV substation kirmich	50	350	2017-18
21	132 kV substation Pipli	30	350	2017-18
22	132 kV substation Pipli	30	350	2017-18
23	132 kV substation Adhon	25	350	2017-18
24	132 kV substation Bhusthla	25	350	2017-18
25	132 kV substation Ismailabad	25	50	2017-18
26	132 kV substation Malikpur	20	50	2017-18
27	132 kV Jundla	25	360	2017-18
28	132 kV Jalmana	30	360	2017-18
29	132 kV Sagga	25	360	2017-18
30	132 kV Sataundi	25	360	2017-18
31	132 kV S/Stn Sector-29 Panipat	25	350	2017-18
32	132 kV S/Stn Naultha	25	350	2017-18
33	132 kV S/Stn Beholi	25	350	2017-18

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
34	132 kV S/Stn Kabri	25	350	2017-18
35	132 kV S/Stn HSIIDC IE Panipat	25	70	2017-18
36	132 kV Narwana (New)	34	350	2017-18
37	132 kV Uchana	25	70	2017-18
38	132 kV Ghogharian	25	70	2017-18
39	132 kV Jind (New)	25	350	2017-18
40	132 kV Alewa	30	350	2017-18
41	132 kV Kheri Taloda	25	350	2017-18
42	132 kV S/Stn Ganaur	25	350	2017-18
43	132 kV S/Stn Rai	25	350	2017-18
44	132 kV S/Stn Begga	25	350	2017-18
45	132 kV S/Stn Khewra	25	350	2017-18
46	132 kV S/Stn Kharkhoda	25	350	2017-18
47	132 kV S/Stn Murthal	25	70	2017-18
48	132 kV S/Stn Kharkhoda	25	350	2017-18
49	132 kV substation Jakhal	20	70	2017-18
50	132 kV substation Dharsul	25	350	2017-18
51	132 kV Bhiwani	16	70	2017-18
52	132 kV Digawan Jattan	30	350	2017-18
53	132 kV Berla	25	350	2017-18
54	132 kV Atela	9	70	2017-18
55	132 kV Dadri- I	16	70	2017-18
56	132 kV S/Stn Shahpur Begu	30	350	2017-18
57	132 kV S/Stn Sikanderpur	9	50	2017-18
58	132 kV S/Stn Jiwan Nagar	30	350	2017-18
59	132 kV S/Stn Odhan	30	350	2017-18
	Total :	1574	15720	
	66 kV S/Stn			
1	220 kV substation sonta	16	50	2017-18
2	220 kV substation Jorian	15.5	350	2017-18
3	220 KV Shahbad	31.5	250	2017-18
4	220 kV Palla	15.5	250	2017-18
5	220 kV Palli	15.5	250	2017-18
6	66 kV substation Sonda	15.5	250	2017-18
7	66 kV substation majri	16	50	2017-18
8	66 kV substation Laha	16	50	2017-18
9	66 kV substation Ber Kheri	16	50	2017-18
10	66 kV substation Shahjadpur	16	50	2017-18
11	66 kV substation Paper Mill	3.5	50	2017-18
12	66 kV substation Paper Mill	3.5	50	2017-18
13	66 kV substation Chandpur	12.5	50	2017-18
14	66 kV substation Basantpura	6	50	2017-18
15	66 kV substation Sector-15 Jaghadhari	12.5	50	2017-18
16	66 kV Sector-3 IMT Manesar	16	50	2017-18

Sl. No.	Name of substation	Capacity Addition (MVA)	Tentative Cost in Rs lac	Tentative Completion Schedule
17	66 kV Pataudi	15.5	250	2017-18
18	66 kV Farukhnagar	15.5	250	2017-18
19	66kV substation Nagina	16	50	2017-18
20	66 kV S/Stn Dabriwala	11.5	250	2017-18
21	66 kV S/Stn Oswal Steel Faridabad	15.5	250	2017-18
22	66 kV S/Stn Dhauj	15.5	250	2017-18
23	66 kV S/Stn Escort- II	15.5	250	2017-18
24	66 kV S/Stn Partap Steel	15.5	250	2017-18
25	66 kV S/Stn Sector-31	15.5	250	2017-18
26	66 kV S/Stn Escort- I	15.5	250	2017-18
27	66 kV S/Stn FCI	15.5	250	2017-18
28	66 kV S/Stn USA	15.5	250	2017-18
29	66kV substation Chandhut	15.5	250	2017-18
30	66kV substation Allawalpur	15.5	250	2017-18
31	66kV substation Hathin	15.5	250	2017-18
	Total :	456.5	5450	
111	Grand Total :	4285.5	34620	

List of Planned Transmission Lines FY 2015-16

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs. in lac	Tentative Completion Schedule
	400 kV Lines			
1	LILO of 400 kV Bahadurgarh – Bhiwani (765 kV PGCIL) line at 400 kV substation Kaboolpur.	5.5	1400	2015-16
	Total :	5.5	1400	
	220 kV Lines			
1	LILO of 220 kV Cheeka – Durala double circuit line at proposed 220 kV substation Sonta	39	1842	2015-16
2	LILO of 220 kV D/C Kunihar - 400 kV PGCIL Naggal line at 220 kV S/Stn Pinjore (on multi Circuit tower).	5.5	1000	2015-16
3	LILO of second circuit of 220 kV Shahbad - Pehowa D/C line at 220 kV substation Durala	4	185	2015-16
4	220kV multi circuit lines from 400kV substation Deepalpur to Rai enroute Khewra-200kV substation RGEN, Kundli	21.5	3200	2015-16
5	220kV Deepalpur-Sector 6 Sonapat line	22	1100	2015-16
6	LILO of one circuit of existing 220 kV D/C Deepalpur- Barhi line having moose size of ACSR conductor at a suitable point	9.5	237.5	2015-16

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs. in lac	Tentative Completion Schedule
7	LILO of both the circuits of 220 kV D/C Fatehabad –Chormar line at 220 kV Hukmawali.	42	2000	2015-16
8	220 kV D/C Sector-72 to Rangla Rajpur line	69	2750	2015-16
9	220 kV A-5 to A-4 D/C line with 0.5 sq. inch ACSR conductor	14	679	2015-16
10	220kV D/C line from 220kV S/S Palwal (Meghpur) to 220kV S/S Meerpur Kurali with 0.5 Sq. inch ACSR conductor	35	1955	2015-16
	Total :	261.5	14948.5	
	132 kV Lines			
1	132 kV S/C Batta-Rajound line on D/C towers.	25	1000	2015-16
2	132 kV S/C Batta-Padla line with 0.4 sq" ACSR.	18	640	2015-16
3	132 kV S/C Batta-Dhanauri line with 0.4 sq" ACSR.	20	700	2015-16
4	LILO arrangement of 2nd circuit of 132 kV D/C PTPS - Chandoli line at 132 kV substation I.E. Panipat.	5	150	2015-16
5	132 kV D/C Barhi - Gannaur line	6	210	2015-16
6	132 kV D/C line from 220 kV substation Mohana to 132 kV substation Harsana Kalan with 0.4 sq. inch ACSR conductor (approx. 17 km).	17	550	2015-16
7	Stringing of 2nd ckt of Rohtak—MDU—Sampla 132 kV line	21	124	2015-16
8	132 kV S/C Kalanaur - Meham line on D/C towers	10	350	2015-16
9	132 kV Hukamawali-Bhattu Khurd S/C line	24	720	2015-16
	Total :	146	4444	
	66 kV Lines			
1	66 kV Sonta - Sonda D/C line	22	930	2015-16
2	66 kV S/C Line on D/C towers from 66 kV Substation Yara to 66 kV Substation Ugala	4	190	2015-16
3	LILO of one circuit of 66kV Double Circuit Sonta- Sonda line with 0.4 sq inch ACSR conductor at proposed 66 kV substation Majri.	5	200	2015-16
4	LILO of one circuit of 66 kV Madanpur-Industrial Area Panchkula D/C line of 0.4 sq inch ACSR conductor at proposed 66	4	150	2015-16

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs. in lac	Tentative Completion Schedule
	kV AIS substation Sector-20 Panchkula with 66 kV underground cable.			
5	66 kV D/C line from proposed 220 kV substation Roj-ka-Meo to 66 kV substation Sohna with 0.4 sq" ACSR conductor.	8.5	110	2015-16
6	66 kV D/C line from 220 kV substation Panchgaon to 66 kV substation Mohmadpur Ahir with 0.4 Sq" ACSR conductor (to lay underground 66 kV power cable equivalent to Zebra conductor where ROW is not available).	9	900	2015-16
7	LILO of one circuit of 66kV D/C 400kV S/S Nawada to 66kV S/S Fatepur Biloch line with 0.4 sq. inch ACSR at 66kV S/S Chainsa along with creation of 2 No. 66kv line bays for LILO arrangement along with double bus arrangement to be interconnected with existing bus without altering the same.	7	500	2015-16
8	LILLO of 66 kV S/C Aurangabad - Hasanpur line at 220 kV substation Meerpur Kurali.	1	20	2015-16
9	66kV S/C line on D/C towers with 0.4 sq. inch ACSR conductor from 220kV substation Meerpur Kurali to 66kv substation Alawalpur with LILO at 66kV substation Chandhut.	15	500	2015-16
10	66kV S/C line on D/C tower with 0.4 sq. inch ACSR from 220kV S/S Meerpur Kurali to 66kV substation Hodal and by using existing ROW of 66kV S/C Palwal-Hodal line near the 66kV substation Hodal.	12	400	2015-16
	Total :	87.5	3900	

List of Planned Transmission Lines FY 2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
	400 kV Lines			
1	400 kV D/C Kirori (Hisar) – Jind 400 kV PGCIL Line	35	3500	2016-17
	Total :	35	3500	
	220 kV Lines			
1	Take in arrangement of existing 220 kV Madanpur-Kunihar D/C line at 220 kV S/Stn Sector-32 and take in arrangement from remaining portion of existing 220 kV Madanpur-Kunihar line at 400 kV S/Stn PGCIL, Naggal.	39.25	2600	2016-17
2	220 kV D/C line with 0.5 sq inch ACSR conductor from 400 kV substation Kaithal (PGCIL) to 220 kV substation Neemwala	36	1800	2016-17
3	LILO of one circuit of 220 kV D/C Pehowa – Kaul line at 800 kV HVDC Bhadson	30	1800	2016-17
4	LILO of one circuit of 220 kV D/C Bastara – Kaul line at 800 kV HVDC Bhadson	30	1800	2016-17
5	220 kV double circuit line from 400 kV substation Kaithal (PGCIL) to 220 kV substation Neemwala	36	2400	2016-17
6	220 kV Twin Moose D/C line between 400 kV substation Nuna Majra and 220 kV substation Nuna Majra.	2	110	2016-17
7	Augmentation of conductor of existing 220 kV D/C Palli – Badshapur line from 0.4 sq” ACSR to conductor with capacity equivalent to twin moose	22.74	795	2016-17
8	LILO of one circuit of 220 kV Daultabad-IMT Manesar D/C line at 220 kV substation Sector 85, Gurgaon.	5	275	2016-17
9	LILO of one circuits of 220 kV D/C NunaMajra – Daultabad line on twin moose capacity at site of 220 kV substation Sector-107	4	220	2016-17
10	LILO of both circuit of 220 kV D/C Sector-72 - Rangla Rajpur line at 220 kV Substation Roj-ka-Meo with 0.5 sq. inch ACSR conductor on cost sharing basis with HSIIDC.	1.5	750	2016-17
11	LILO of D/C FGPP-BBMB Samaypur (PGCIL line) at 220 kV Sector-58 S/Stn	1.25	100	2016-17
12	LILO of one circuit of 220 kV D/C A-4 to A-5 line at Faridabad Gas Power Plant by HVPNL.	3.7	300	2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
13	Augmentation of conductor of existing 220 kV D/C Samaypur - Palli line from 0.4 sq" ACSR to conductor with capacity equivalent to twin moose.	9.32	326	2016-17
14	Augmentation of conductor of existing 220 kV D/C Samaypur - Palwal line from 0.4 sq" ACSR to conductor with capacity equivalent to twin moose.	22	770	2016-17
15	LILO of both circuits of existing 220 kV Palla - Palli D/C line at proposed 220 kV substation Sector-46	2.4	70	2016-17
16	Replacement of conductor of 66kV S/C from 220 kV Substation Palwal to Bhagola line with AAAC conductor.	6.3	600	2016-17
17	LILO of both the circuits of 220 kV D/C Narwana-Mund line at 400 kV Khatkar (Jind) PGCIL with 0.4 Sq. inch ACSR conductor.	44	2000	2016-17
18	220 kV Bhiwani (765 kV PGCIL) - Isharwal D/C line with 0.5 sq" ACSR. (Approx. 65 km).	65	5100	2016-17
19	220 kV Bhiwani (765 kV PGCIL) - Bhiwani (220 kV HVPNL) D/C line with 0.5 sq" ACSR. (Approx. 15 km)	15	1300	2016-17
20	220kV D/C from 400 kV substation Panchgaon (PGCIL) to 220 kV substation Panchgaon (HVPNL) line with twin conductor on multi circuits/ double circuit towers.	10	500	2016-17
21	LILO of one Ckt. Of D/C 220 kV Sector-72-Sector-52A line at Sector 57 on multi circuit towers.	0.2	100	2016-17
	Total :	385.66	23716	
	132 kV Lines			
1	132 kV D/C line on double circuit towers with 0.4 sq' inch ACSR conductor from 220 kV substation Neemwala to common point (about 8kMs) near Nautch and thereafter creation of 132kV S/C line on 132kV D/C tower up to 132kV substation Nautch and creation of 132kV S/C line on 132kV D/C tower from common point to 132kV substation Siwan	14	560	2016-17
2	132 kV S/c line on double circuit towers with 0.4 sq' inch ACSR conductor from 220 kV substation Neemwala to 132 kV substation Bhagal	7.5	200	2016-17
3	LILO of existing 132 kV Cheeka (220 kV)-Kheri Gulam Ali S/C line on D/C towers with 0.4 ACSR conductor at 132 kV Chakuladana	6	150	2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
4	132 kV D/C line from 220 kV S/stn. Unisapur upto the common point. Thereafter construction of 132 kV S/C line with on 132 D/C Towers from common points to 132 kV S/stn. Pipli and construction of 132 kv D/C Towers from common point to 132 kV S/Stn. Bhadson	13.46	540	2016-17
5	132 kV S/C line on 132 kV D/C towers from 132 kV s/stn. Bhadson to 132 kV s/stn. Indri	11	440	2016-17
6	Replacement of 0.2 sq" ACSR conductor of 132 kV S/C Karnal- Madhuban line with high capacity conductor nearly equivalent to 0.4 sq inch ACSR conductor.	10	200	2016-17
7	Replacement of 0.2 sq" ACSR conductor of 132 kV S/C Bastara- Madhuban line with high capacity conductor nearly equivalent to 0.4 sq inch ACSR conductor.	4.5	100	2016-17
8	LILO of 132 kV S/C Karnal-Madhuban line at proposed 132 kV S/Stn. HSIIDC Sector-37.	1	20	2016-17
9	132 kV D/C line with ACSR conductor size of 0.4 Sq. inch of length about 9 KM from 220kV substation Jind to new 132 kV substation Sector- 9 Jind by HVPNL	9	500	2016-17
10	Bifurcation of one circuit of 132 kV Dadhibana - Berla D/C line by creating 132 kV D/C 0.4 sq. inch line upto 132 kV substation Badhra and terminating one circuit at Badhra and further extending other circuit to 132 kV substation Loharu with S/C 0.4 sq. inch line on D/C towers.	12	555	2016-17
11	132 kV D/C line from 220 kV substation Dadhi Bana to 132 kV substation Jhojju Kalan.	6	300	2016-17
12	132 kV Nangal Mohanpur - Ateli TSS D/C line with 0.4 sq" ACSR as a deposit work of DFCCIL	27	1215	2016-17
	Total :	121.46	4780	
	66 kV lines			
1	Creation of LILO of 66kV S/C Shabad-Babain line with 0.15 sq inch ACSR conductor at 66kV substation Jalkheri.	2	150	2016-17
2	LILO of 66 kV S/C Shahbad- Nalvi line with 0.2 sq. inch ACSR Conductor (1.5km approximately) along with double bus arrangement at 66kV substation Kalsana.	1.5	90	2016-17
3	LILO of one circuit of 66 kV D/C Khera (BBMB) - Sadhaura line, 0.2 sq inch ACSR conductor at 66 kV substation Talakaur.	10	300	2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
4	66 kV S/C line on D/C towers from proposed 220 kV substation Rampur Kamboan to TL-94 of existing section of 132 kV S/C Giri - Abdullapur line (Haryana portion).	2.5	50	2016-17
5	66 kV S/C line on D/C towers from TL-167 of existing section of 132 kV S/C Giri - Abdullapur line (Haryana portion) to 66 kV substation Jaroda/Gulab nagar.	2.5	50	2016-17
6	66 kV D/C Salempur-Basantpur line	22	880	2016-17
7	66 kV double circuit line from 220 kV substation Sector-57 Gurgaon to proposed 66 kV (DMRC) Metro. The supply will be given through underground cables or overhead system	6	420	2016-17
8	66 kV D/C line from 220 kV substation Sector 56 Gurgaon to 66 kV substation by M/s Canton Buildwell Pvt. Ltd. on Gurgaon - Faridabad Road	7	240	2016-17
9	66 kV double circuit underground XLPE cable of size 1200 sq. mm (8 single core cable) from 220 kV Sector-20 to HLF Ambience, Gurgaon by HVPNL as a deposit work of HLF Ambience.	5	500	2016-17
10	Augmentation of 66 KV Badshahpur-Sec-15-II-M/Road D/C line portion from Sec-15-II-M/Road (2.5 KM) from 0.15 sq. inch ACSR conductor with conductor having current carrying capacity of about 600 Amperes.	2.5	600	2016-17
11	Augmentation of 66 KV M/Road-Maruti S/C line (7.0 KM) from 0.15 sq. inch ACSR conductor with conductor having current carrying capacity of about 600 Amperes.	7	1400	2016-17
12	Augmentation of 66 KV Sec-34-Sec-10A D/C line (3.5 KM) from 0.15 sq. inch ACSR conductor with conductor having current carrying capacity of about 600 Amperes.	3.5	800	2016-17
13	Augmentation of one circuit of 66 KV Daultabad-Sector-9 D/C line (7 KM) from 0.4sq inch ACSR with conductor having current carrying capacity of about 1200 Amperes. (The circuit which is not being LIL0ed at 66 kV substation Sector-4).	7	1400	2016-17
14	Augmentation of 66 KV Dundahera Ph-IV-Sec-23A D/C line (4.2 KM) from 0.20 sq. inch ACSR with conductor having current carrying capacity of about 600 Amperes.	4.2	900	2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
15	Augmentation of 66 KV Daultabad-Sector-2 D/C line (11 KM) from 0.4sq inch ACSR with conductor having current carrying capacity of about 1200 Amperes.	11	2000	2016-17
16	LILO of one circuit of 66 kV Sector-72 Gurgaon-Sector-33 Gurgaon D/C line at 66 kV substation Sector-38 Gurgaon. (LILO to be carried out from Sector-33- 66 kV Vipul section of 66 kV Sector-72 -Sector-33 D/C line)	5	100	2016-17
17	66 kV D/C line from 66 kV Sector-33-Sector-10A with 0.4 sq. inch ACSR conductor by creation of new line upto near Sector-34 and utilizing the existing Sector-10 Sector-34D/C line with 0.15 sq. inch ACSR conductor	5	100	2016-17
18	LILO of D/C 66 kV BBMB Ballabgarh-Jharsetly line at 220 kV Sector -58	0.5	40	2016-17
19	66 kV D/C link from 220 kV substation Palli to 66 kV substation Dhauj.	4	300	2016-17
20	66 kV D/C line from proposed 400 kV substation Nawada to 66 kV substation Fatehpur Biloch.	8.8	616	2016-17
21	LILO of one circuit 66 kV D/C A4 – A5 line, having 0.2 Sq” INVAR Conductor, with 0.4 Sq” ACSR Zebra Conductor 66 kV substation Idgah.	3	110	2016-17
22	Replacement of conductor of 66kV BBMB-A-2 Ckt-III LILO with higher capacity or additional connectivity at Hyderabad	8.8	264	2016-17
23	Replacement of conductor of 66kV BBMB – A2 Ckt IV with higher capacity or additional connectivity at Dabriwala	8.8	264	2016-17
24	LILO of both circuits of 66 kV NH-3 - Palla D/C line at 66 kV sector-46 by laying 66 kV Underground XLPE cables	1	50	2016-17
25	Replacement of conductor of 66kV S/C from 220 kV Substation Palwal to Bhagola line with AAAC conductor.	6.3	600	2016-17
26	LILO of both circuit of 66 kV D/C Palla-NH-3 line at proposed 66 kV S/Stn. USA underground with equilant 66 kV XLPE cable (Route Length 3.39 Km) of size 1200sq. mm	3.3	600	2016-17
27	66kV D/C line from 220kV S/S Palwal to Sector – 2 Palwal	20	656	2016-17
28	Lay single circuit (4 cables) 1200 sq. mm, 66 kV underground aluminum conductor XLPE cable between 220 kV substation Sector-52A and 66 kV substation Sector-44 (approx. 1.8 km).	1.8	600	2016-17

Sl. No.	Line Section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
29	66kV S/C Hathin - Punhana line	22	535	2016-17
30	66 kV S/C Rangala Rajpur - Punhana line on D/C towers	38	1800	2016-17
31	LILO of one circuit of 66 kV D/C Panchgaon - Mohamadpur Ahir line at Taoru	9	400	2016-17
	Total :	239	16815	

List of Planned Transmission Lines FY 2017-18

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
	220 kV Lines			
1	<p>Multi circuit line suitable for 220 kV D/C line of Moose ACSR conductor from 400 kV substation Panchgaon (PGCIL) to 220 kV substation for future and 66 kV D/C line of Zebra ACSR conductor from 220 kV substation Panchgaon to 66 kV substation Jamalpur and Farukhnagar earlier approved up to National Highway crossing would be further extended in such manner that 220 kV D/C line with moose conductor on 220 kV multi circuit towers meant from 400 kV substation Panchgaon (PGCIL) up to 220 kV substation (future) and 66 kV D/C line of Zebra ACSR conductor from 220 kV substation Panchgaon to 66 kV substation Jamalpur and Farukhnagar shall be utilized further as</p> <p>i) Creation of 66 kV D/C line from 220 kV S/Stn Panchgaon to 66 kV substation Farukh Nagar of approx. length of 23.2 km with LILO of one circuit of 66 kV D/C Panchgaon - Farukhnagar line at proposed 66 kV S/Stn Jamalpur.</p> <p>ii) LILO of one circuit of 66 kV D/C Harsaru - Pataudi line at proposed 220 kV substation, Panchgaon at a distance of about 12 km from Panchgaon.</p>	36	1800	2017-18
2	LILO of both the circuit of existing 220 kV D/c Palli – Badshahpur line with twin moose line on multi circuit towers up to diversion point for the feed of future 220 kV substation sector-59 and thereafter on D/c towers to 220 kV substation Sector-65 Gurgaon en-route location of future 220 kV substation sector-62	7	350	2017-18

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
3	LILO of both circuits of 220 kV Sector-72 Gurgaon – Rojka Meo – Rangala Rajpur D/C line (Rojka Meo – Rangala Rajpur) on multi circuits towers at 220 kV substation Sector-69 Gurgaon with twin moose conductor	2	110	2017-18
4	LILO of both circuits of 220 kV Badshahpur – Panchgaon (400 kV PGCIL) D/C line on multi circuits towers at 220 kV substation Sector-77 Gurgaon with twin moose conductor	4	140	2017-18
5	LILO of both circuits of 220 kV Daultabad – Mau D/C line on multi circuits towers at 220 kV substation Sector-95 Gurgaon with twin moose conductor	2	200	2017-18
	Total :	51	2600	
	132 kV Lines			
1	Stringing of 2nd circuit of existing 132 kV Cheeka - Kheri Gulam Ali line	21.8	218	2017-18
2	132 kV S/C Kaithal - Pai line	18	540	2017-18
3	Replacement of 0.2 sq" ACSR conductor of 132 kV S/C Nissing- Sagga line with high capacity conductor	16	320	2017-18
4	Replacement of 0.2 sq" ACSR conductor of 132 kV S/C Chhajpur - Chandoli line with 600 AMP capacity conductor	10	250	2017-18
5	Stringing of 2nd circuit of existing 132 kV Samalkha - Naultha line	15.5	393.5	2017-18
6	Stringing of 2nd circuit of existing 132 kV Samalkha - Beholi line	12.5	312.5	2017-18
7	Stringing of 2nd circuit of existing 132 kV Bastara-HSIIDC line	10	100	2017-18
8	132 kV S/C line on D/C tower from 132 kV HSIIDC Panipat-132 kV M/s Air Liquid North India Pvt. Ltd. with 0.4 sq. inch conductor.	10	100	2017-18
9	Replacement of 0.2 sq" ACSR conductor of 132 kV S/C line from 220 kV Rai to 132 kV Rai with 600 AMP capacity conductor	1	25	2017-18
10	Stringing of 2nd circuit of existing 132 kV Samalkha - Begga line	12	300	2017-18
11	132 kV S/C Tajpur- Begga line	10	350	2017-18
12	LILO of 132 kV Bhiwani - Tosham S/C line at 132 kV S/Stn. Sangwan with 0.4 sq" ACSR Conductor.	1.5	52.5	2017-18
13	Stringing of 2 nd Circuit of 132 kV Nuhiyanwali-Dhudianwali D/C line with 0.4 sq" ACSR	22	439	2017-18
14	LILO of 132 kV Narwana – Tohana S/C line at 220 kV substation Samain	10	300	2017-18
15	132 kV Nuhiyanwali (400 kV)-Assa Khera S/C line with 0.4 sq" ACSR on D/C towers (40 km).	40	1800	2017-18

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
16	Stringing of 2nd circuit of 132 kV Hukmawali – Bhattu Khurd S/C line on D/C towers with LILO of one circuit at Ding	17	454	2017-18
17	132 kV S/C line with from 132 kV substation Ateli to 132 kV substation Mundia Khera.	11	210	2017-18
18	Stringing of second circuit of 132 kV Dhanonda – Nangal Mohanpur S/C line on existing D/C towers with 0.4 sq" ACSR as a deposit work of M/s DFCCIL.	10	201	2017-18
19	132 kV S/C line from proposed 132 kV substation Seka to 132 kV substation Ateli.	20	380	2017-18
20	132 kV D/C Lula Ahir – Jatusana line with ACSR Zebra conductor on 2-phase by HVPNL as a deposit work to M/s Rail Vikas Nigam Limited.	10	200	2017-18
21	Replacement of conductor between 132 kV substation Rohtak and 132 kV Sec-3, Sonapat Road Rohtak on the existing tower structures without requiring mid span installation.	5.5	110	2017-18
22	Augmentation of conductor of 132 kV D/C line from 220 kV substation Rohtak to 132 kV substation Khokhrakote with equivalent AL-59 conductor.	1.5	25	2017-18
23	132 kV D/C underground XLPE power cable from 220 kV S/stn. Nuna Majra to feed 132 kV S/stn. DMRC for Mundka - Bahadurgarh metro line.	12	480	2017-18
24	132 kV S/C line on D/C tower from 220 kV substation Bastra to 132 kV I.E. Panipat.	10	300	2017-18
25	132kV double circuit line on double circuit towers with 0.4sq inch ACSR conductor from 220kV substation Mund to 132kV substation Alewa.	12	720	2017-18
26	Stringing and sagging of 2nd circuit of existing 132 kV Durala-Adhon S/C line on D/C tower	3	30	2017-18
27	LILO of existing 132 kV Cheeka (220 kV)-Kheri Gulam Ali S/C line on D/C towers at 132 kV Chakuladana (KAITHAL)	6	240	2017-18
28	LILO of 132 kV S/C Rohtak –Meham line at 132 kV substation Chandi	10	390	2017-18
	Total :	338.3	9240.5	
	66 kV			
1	Creation of LILO of 66kV D/C line with 0.4 sq" inch ACSR conductor from 220 kV substation Raiwali to 66 kV substation HSIIDC IE Barwala.(Deposit work)	12	360	2017-18
2	LILO of one ckt. Of existing 66 kV Madanpur (220 kV)-Barwala D/C line at 66 kV HSIIDC Barwala (about 3 kms) with 0.4 sq" ACSR conductor.(Deposit work)	3	75	2017-18

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
3	Replacement of 0.15sq" AAAC conductor with higher capacity HTSL conductor having current carrying capacity about 600 A from LILO point to 66 kv substation Barwala of one ckt. Of 66 kV Madanpur-Barwala line.	5	50	2017-18
4	LILO of 66kV Shahbad- Jansui line having conductor 0.15 sq inch ACSR along with bus sectionalizer arrangement at 66kV substation Nalvi.	1	70	2017-18
5	Stringing 2 nd ckt of 66kV Sector 23A – Dundahera line.	3.5	161	2017-18
6	connectivity between 66 kV substation Sector-9 and 66 kV substation Sector 10A Gurgaon by laying of four (4) no. 1200 sq. mm underground XLPE cable.	1.15	100	2017-18
7	66 kV D/C line between proposed 220 kV substation sector-33 Gurgaon and existing 66 kV substation sector-34 Gurgaon.	2	100	2017-18
8	66 kV S/C line on underground cable from 220 kV GIS substation sector-20 to 66 kV phase-I Udyog Vihar, Gurgaon.	2	600	2017-18
9	LILO of one circuit of 66 kV D/C Daultabad-Sector-9 Gurgaon at Sector-4 line with underground cable consisting of 8 numbers single core XLPE cable of size 1200 sq mm. The total route length of the cable is 3470 meters.	3.4	800	2017-18
10	LILO of one circuit of 66 KV Dundahera PH-IV- Sec-23A D/C line at proposed 66 KV S/Stn Udyog Vihar PH-I (GIS) HSIIDC Gurgaon through underground cable (8 core) of size 1200 mm ² (approximately length - 3100 Mtr.) by HVPNL.	3.1	800	2017-18
11	Stringing of 66 kV D/C line with 0.4 Sq. inch ACSR on under construction multi circuit towers from 220kV substation Sector-20 to a point on NH-8 Highway opposite 66kV substation Dundahera (approximately 4km length) and thereafter through 66kV D/C underground cable (8 cores) of size 1200 mm ² up to 66kV substation Dundahera (approximately length - 250 Mtr.)	0.25	100	2017-18
12	LILO of one circuit of 66 kV Badshahpur-Sector 15(II)- Mehrauli road Gurgaon line at 66kV substation Sector-47 (Unitech), through underground cable by laying 8 nos. 66 kV 1200 mm ² XLPE cable by HVPNL at its own cost.	10	1000	2017-18
13	66 kV D/C line from 220 kV substation Sec-57, Gurgaon to proposed 66 kV substation Sector-45, Gurgaon by laying eight single core 1200 sq. mm underground XLPE aluminium cable. (approx. 7 Km.)	7	700	2017-18
14	LILO of one circuit of 66 kV Sector-44 – Sector-38 D/C	1.5	150	2017-18

Sl. No.	line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
	line at 66 kV substation, Sector-45, Gurgaon by laying of eight single core 1200 sq. mm underground XLPE aluminium cable.(approx 1.5 Km.)			
15	66 kV S/C Mandkola - Nuh line (New line) on D/C towers	20	420	2017-18
16	LIL Oof one ckt. of D/C 66 kV BBMB Ballabgarh- 220 kV Sector -58 line at 66 kV Sector-59 S/Stn.	3.2	200	2017-18
17	66 kV D/C 220 kV Sector-58-Bhagola line.	7	350	2017-18
18	66kV D/C line from 220kV substation BBMB to 66kV substation Jharsetly with 0.4 sq. inch ACSR conductor using existing Right of Way of Ckt No.1 on H-pole.	7	500	2017-18
19	66 kV D/C Nawada – Badrola line	5.5	350	2017-18
20	Replacement of conductor of 66kV D/C A4 to Ford line with higher capacity or additional connectivity at Ford.	5	600	2017-18
26	LILO of both cirtcuit of 66 kV D/C Palla-NH-3 line at proposed 66 kV S/Stn. Sector-21-D Faridabad	1.5	50	2017-18
	Total :	104.1	7536	

List of Planned Transmission Lines FY 2018-19

Sl. No.	Line section	Line Length (Kms)	Tentative Cost Rs in lac	Tentative Completion Schedule
	400 KV			
1	Lilo of 400 KV D/C Dhanoda - Daultabad line at Farukhnagar	10	1000	2018-19
	Total :	10	1000	
	220 kV			
1	220 kV D/C line from proposed 400 kV substation BBMB Sewah to 220 kV substation Chhajpur.	16	1000	2018-19
2	LILO of both circuits of 220 kV Fatehabad - Rania line at proposed 220 kV substation Mehna Khera with 0.4 Sq' ACSR.	28	1260	2018-19
3	LILO of 220 kV D/C Daultabad-Mau line at 220 kV S/stn Transport Hub Gurgaon.	5	250	2018-19
	Total :	49	2510	
	132 kV			
1	132 kV S/c line on double circuit towers from 220 kV substation Neemwala to 132 kV substation Bhagal	7.5	260	2018-19
2	132 kV Mehna khera (220 kV substation) - Ellenabad S/C line on D/C towers with 0.4 sq' ACSR. Line length - approx. 13 km.	13	585	2018-19
3	132 kV Mehna Khera (220 kV substation) - Madho Singhana - Ram Nagaria D/C line with 0.4 sq' ACSR.	11	495	2018-19
	Total :	31.5	1340	
	66 kV			
1	66 kV D/C line from 220 kV substation Transport Hub to 66 kV substation Technology Park	10	350	2018-19
	Total :	10	350	

Details of proposed planning of new/augmentation of sub-station

Sl. No.	Name of the S/S	Voltage class in use	Different capacity in use(MVA)	Aggregate capacity (MVA)	Tentative Completion Schedule
1	Kurushetra	400/220	2x500	1000	2015-16
	Kaithal (aug)	400/220	1x315	315	2016-17
	Panchkula(aug)	400/220	1x500	500	2016-17
	Gurgaon(aug)	400/220	2x500	1000	2016-17
	Fatehabad (aug)	400/220	1x315	315	2017-18
Above details are with respect to POWERGRID. TBCB new projects not included.					

Details of POWERGRID Lines in Haryana

Sl. No.	Name of the Line	Length in ckt km	Voltage Level in kV
1	FGPP - Palla-I	15.69	220
2	FGPP - Palla-II	15.69	220
3	FGPP - Samaypur-I	17.691	220
4	FGPP - Samaypur-II	17.691	220
5	Hissar - Hissar I/A-I	13.77	220
6	Hissar - Hissar I/A-II	13.77	220
		94.302	
1	Agra - Ballabgarh	181.137	400
2	Bhiwadi - Hissar	211.547	400
3	Ballabgarh - Gurgaon	43.242	400
4	Gurgaon - Bhiwadi	83.342	400
5	Navada - B'garh (upto LILO point)	12.55	400

Sl. No.	Name of the Line	Length in ckt km	Voltage Level in kV
6	Maharanibagh - Ballabhgarh	60.68	400
7	Dadri - Panipat-I	112.322	400
8	Dadri - Panipat-II	116.65	400
9	Kanpur - Ballabhgarh I	385.69	400
10	Mainpuri - Ballabhgarh-I	235.952	400
11	Mainpuri - Ballabhgarh-II	235.952	400
12	Kanpur - Ballabhgarh II	370.772	400
13	Kanpur - Ballabhgarh III	370.772	400
14	Manesar - Neemarana I	67.037	400
15	Manesar - Neemarana II	67.037	400
16	Gurgaon - Manesar I	16.9	400
17	Gurgaon - Manesar II	16.9	400
18	Abdullapur - Bawana-I	166.64	400
19	Abdullapur - Depalpur (upto LILo point)	140.547	400
20	Depalpur - Bawana (upto LILo point)	26.095	400
21	Hissar - Kaithal I	113.12	400
22	Hissar - Kaithal II	113.12	400
23	Kaithal - Patiala I	126	400
24	Kaithal - Patiala II	126	400
25	Moga - Hisar I	209.39	400
26	Moga - Fatehabad	179.28	400
27	Fatehabad - Hissar	88.56	400
28	Hissar - Bhiwani-I	34.52	400
29	Bhiwani(BBMB) - Bahadurgarh	84.377	400
30	Bahadurgarh - Bawana	48.981	400
31	Bhiwani - Bawana	97.415	400
32	Hissar - Bhiwani II	64.461	400
33	Bhiwani (BBMB) - Bhiwani	33.962	400
34	Bahadurgarh - Sonapat I	53.4	400
35	Bahadurgarh - Sonapat II	53.4	400
36	Kaithal - Meerut I	163.7	400
37	Kaithal - Meerut II	163.7	400
38	Abdullapur - Sonapat I	145.5	400
39	Abdullapur - Sonapat II	145.5	400
40	Abdullapur - Panchkula I	63	400
41	Abdullapur - Panchkula II	63	400
42	Panchkula - Naptha Jhakri I	165	400
43	Panchkula - Naptha Jhakri II	165	400
44	Bhiwani - Jind I	82.226	400
45	Bhiwani - Jind II	82.226	400
		5586.602	
1	Bhiwani - Jhatikalan	85	765
	Meerut - Bhiwani	173.692	765
2	Moga - Bhiwani	273	765
		531.692	

POWERGRID IN HARYANA (Existing Transmission line details and Proposed Substations & lines)**A) Existing transmission facilities:**

POWERGRID has following transmission system in Haryana:

765kV transmission lines	:	500 ckm
400kV transmission lines	:	about 5590 ckm
220 kV transmission lines	:	about 100 ckm
765 kV Substations	:	1 (Bhiwani) (Est. Capacity: 2000 MVA)
400kV substations	:	12 (Total Capacity- about 11745 MVA) (Hissar, Abdullapur, Ballabgarh, Kaithal, Bahadurgarh, Gurgaon, Fatehabad, Panchkula, Sonapat, Manesar, Jind & Bhiwani)

B) Ongoing/Proposed Schemes

POWERGRID has undertaken/planned a number of transmission works in Haryana to strengthen the connectivity of Haryana State Grid with National Grid.

Some of the major works are as given below:

i. Dehradun-Adullapur 400kV D/c Quad

A high capacity 400kV D/c Quad line is under construction from Dehradun to Abdullapur. The line shall facilitate Haryana to access hydro power from Uttarakhand area and further access thermal power from Eastern region through Bareilly- Roorkee-Saharanpur 400kV D/c line of POWERGRID

- Dehradun- Abdullapur 400kV D/c (Quad) –240 ckm

ii. Augmentation of transformation capacity in Haryana

To meet the growing power demand of Haryana, POWERGRID has taken up augmentation of transmission capacity in following substations. This would enable Haryana to draw its share of power from the Grid:

- Augmentation of Transformation capacity at Gurgaon by 2x500MVA 400/220kV Transformer is expected to be commissioned during 2016-17.
- Augmentation of Transformation capacity at Panchkula by 1x500MVA 400/220kV Transformer is expected to be commissioned during 2016-17.
- Augmentation of Transformation capacity at Kaithal by 1x315MVA 400/220kV Transformer is expected to be commissioned during 2016-17.
- Augmentation of Transformation capacity at Fatehabad by 1x315MVA 400/220kV Transformer is expected to be commissioned during 2017-18.

iii. System strengthening for Haryana

For transfer of Power from IPP's in Odisha / Chattisgarh to Northern region, via Western region, Gwalior(POWERGRID) - Jaipur(RRVPNL) -Bhiwani(POWERGRID) 765kV lines have been planned. Power from Gwalior would partly meet the load of Jaipur and partly be transferred towards Bhiwani. With increased generation addition in Rajasthan and a large quantum of import from WR side, following transmission system is under implementation to strengthen the grid connectivity of Haryana. The system includes :

- Jaipur (RVPN) -Bhiwani 765kV 2XS/c -650 ckm.
- Bhiwani (PG)-Hisar 400kV D/c – 100 ckm.
- LILO of Moga- Bhiwadi 400kV D/c at Hissar – 10 ckm.
- The above transmission scheme is expected to be commissioned by Mar. '16.

iv. Establishment of 6000 MW HVDC bipole to Kurukshetra:

To facilitate Haryana to receive power from IPP's generation in Chattisgarh and to have a direct supply from the source to Haryana, an HVDC bipole of 6000MW capacity has been proposed from Champa (Chattisgarh) to Kurukshetra. The scheme includes:

- ± 800 kV, 6000MW HVDC bipole between Champa Pooling Station Kurukshetra (Haryana) (The scheme is being implemented in two phases with 3000 MW HVDC bipole in each phase. First phase is likely to be completed by December 2015 and second phase of another 3000 MW is expected by 2016-17).
- Establishment of 400/220kV 2x500 MVA S/s at Kurukshetra –June '15.
- Kurukshetra(NR) - Jalandhar 400kV D/c(Quad) –June '15.
- LILO of Abdullapur – Sonapat 400kV D/c(triple) at Kurukshetra –June '15.
- Kurukshetra – Jind 400 kV D/c –Mar.'18.

v. Creation of new 400kV substations in Gurgaon area & Palwal area as a part of ISTS (The scheme was agreed in 35th SCM of NR held on 3/11/14) – Proposed under TBCB

The system would strengthen the power supply around Gurgaon and Palwal area and would ensure reliable and quality supply of power.

- Establishment of 2*500 MVA, 400/220 kV substations at Kadarapur & Sohna Road in Gurgaon area and Prithla in Palwal area.
- Creation of 400kV level at Aligarh substation by adding 2x1500MVA 765/400kV ICTs.
- Aligarh – Prithala 400kV D/c Quad line.
- Prithala – Kadarapur 400kV D/c Quad line.
- Kadarapur – Sohna Road 400kV D/c Quad line.
- LILO of both circuits of Gurgaon – Manesar 400kV D/c at Sohna Road S/s.
- Neemrana – Dhanonda(HVPNL) 400kV D/c Quad line.

UHBVN**District Wise overall Plan and fund requirement against projects to be covered under IPDS**

District Wise overall Plan and fund requirement against projects to be covered under IPDS																				
Sr. No	Item of work	unit	District wise																	
			Panipat		Jhajjar		Yamunanagar		Kurukshetra		Rohtak		Kaithal		Sonapat		Ambala		Karnal	
			Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)
A. Feeder Separation																				
1	33 KV Feeder	Km	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	11 KV Feeder	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	LT Line	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Distribution Transformer	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	33 KV Feeder	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Strengthening of Sub-Transmission and Distribution Network																				
1	33/11KV or 66/11KV S/S																			
	New substation	MVA	37.5	900	37.5	1350	0	0	12.5	450	0	0	25	450	75	2700	0	0	50	1800
	Additional Transformer	MVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Augmentation Enhancement	MVA	62.5	700	29.5	420	0	0	62.5	700	65	840	0	0	137.5	1680	0	0	37.5	700
	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations (details of Substations & works to be provided in DPR)	MVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	33 KV feeders																			
	New	km	31	342.55	0	0	0	0	0	0	5	55	0	0	18.5	203.5	0	0	0	0
	Augmentation	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	New 11 KV feeders-																			
	New	km	108.75	659.875	85	504.376	252.35	1428.48	82.15	520.346	122.6	752.713	47.8	286.8	146.8	989.432	96.85	610.333	140.8	844.8
	Augmentation	km	0	0	0	0	64.8	143.484	26.25	157.5	42	252	2.53	48.576	0	0	143.2	508.818	0	0
4	Distribution Transformer-New	MVA	20.5	420.73	2.5	56.79	13.453	299.18	6.4	136.22	4.619	123.51	11.086	253.01	7.5	161.27	15.5	318.51	105.5	2174.7
5	Distribution Transformer-R&M	MVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Distribution Transformer-Augmentation	MVA	12.125	523.56	1.033	94.32	18.734	766.64	4.699	275.04	2.228	215.88	8.51	372.72			27.784	1059.04	0.9	63.36

UHBVN

District Wise overall Plan and fund requirement against projects to be covered under IPDS

Sr. No	Item of work	unit	District wise																	
			Panipat		Jhajjar		Yamunanagar		Kurukshetra		Rohtak		Kaithal		Sonapat		Ambala		Karnal	
			Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)
6	LT Line																			
	New	km	75	403.5	32	143.66	64	344.32	19	102.22	67	360.46	27	143.26	120	635.1	64	188.58	207	1115.66
	Augmentation	km	60	126.5	0	0	89	191.62	27	53.46	53.98	138.6	33	65.34	0	0	0	0	0	0
7	Capacitor Bank		0	0	0	0	0	0	7.2	6.984	2.7	2.619	0	0	3	6	0	0	1	0.97
8	Aerial Bunched Cables	km	126	681.97	15	86.7	100.9	551.792	104.3	530.534	16	90.48	48	251.24	20	111.6	186.74	1046.05	82.2	475.116
9	Underground Cables	km	4	49.22	1	10.74	21.8	226.332	9	96.66	1	10.74	5	53.7	2.5	26.85	6	64.44	0.1	3.348
C. Metering																				
1	Feeder	Nos	2	0.54	0	0	0	0	5	1.35	0	0	0	0	0	0	0	0	0	0
2	Distribution Transformer	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Consumer	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Prepaid Meters	Nos	51	5.1	50	5	81	8.1	87	8.7	84	8.4	82	8.2	89	8.9	133	13.3	346	34.6
5	Installation and shifting of energy meter with electronic meter	Nos	8000	300	3500	135	7500	290	8000	310	14000	540	8000	310	17000	640	5000	190	25000	960
6	Improvement and laying of HT system for tourist and religious Brahm Sarovar area with HT XLPE cable/RMU/DTs		0	0	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	0

UHBVN**District Wise overall Plan and fund requirement against projects to be covered under DDUGJY**

District wise Overall Plan and fund requirement against projects to be covered under B203/1																				
Sr. No	Item of work	unit	District wise																	
			Panipat		Jhajjar		Yamunanagar		Kurukshetra		Rohtak		Kaithal		Sonepat		Ambala		Karnal	
			Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)
A. Feeder Separation																				
1	33 KV Feeder	Kms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	11 KV Feeder	Kms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	LT Line	Kms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Distribution Transformer	MVA/No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	33 KV Feeder		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Strengthening of Sub-Transmission and Distribution Network																				
1	33/11KV or 66/11KV S/S	MVA																		
	New substation	No / MVA	11 / 175	4950	2 / 20	900	0	0	3 / 45	1350	6 / 60	2700	9 / 177.5	4050	10 / 120	4500	0	0	7 / 72.5	3150
	Additional Transformer	MVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Augmentation Enhancement	No / MVA	18 / 149.6	2250	4 / 19.2	500	0	0	9 / 69.1	1125	4 / 33.7	500	18 / 155.5	2250	23 / 165.4	2875	0	0	33 / 190.9	4125
	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations (details of Substations & works to be provided in DPR)	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	33 KV feeders	Kms																		
	New	Kms	22.5	170.775	21.5	163.185	0	0	20	151.8	23.5	178.365	24	182.16	20.5	155.595	0	0	20.55	155.975
	Augmentation	Kms	38	288.42	33	250.47	0	0	35	265.65	32	242.88	35	265.65	37.5	284.625	0	0	31.3	237.567

UHBVN

District Wise overall Plan and fund requirement against projects to be covered under DDUGJY

Sr. No	Item of work	unit	District wise																	
			Panipat		Jhajjar		Yamunanagar		Kurukshetra		Rohtak		Kaithal		Sonapat		Ambala		Karnal	
			Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)	Qty	Amount (in Lakhs)
3	New 11 KV feeders-	Kms																		
	New	Nos / Kms	88 / 309.42	1496	17 / 65.64	289	55 / 406.3	935	65 / 286.13	1105	5 / 29.2	85	176 / 684.95	2992	57 / 204	969	41 / 197.92	697	145 / 741.39	2465
	Augmentation	Kms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Distribution Transformer- New	MVA / Nos	31.979 / 391	586.64	41.14 / 470	733.28	57.27 / 873	1158.95	38.776 / 490	722.38	47.51 / 538	844.62	52.99 / 845	1087.59	52.741 / 567	917.57	60.394 / 729	1103.57	55.665 / 930	1168.25
5	Distribution Transformer- Augmentation	MVA / Nos	7.764 / 187	259.39	17.914 / 441	569.97	35.398 / 919	1170.63	19.167 / 508	650.26	19.721 / 525	651.7	20.186 / 538	625.28	15.423 / 412	542.48	22 / 538	713.75	17.685 / 475	604.2
5	Distribution Transformer- R&M	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	LT Line																			
	New	Kms	104.49	282.12	244	658.8	292	847.7	131.06	353.86	246	664.2	561	1514.7	258.6	698.22	320.7	1135.27	450	1215
	Augmentation	Kms	101.2	59.7	183	71.37	1010.1	448.05	315.49	123.04	244	95.16	841	327.99	247.45	145.99	349.75	206.35	880	343.2
7	Capacitor Bank	MVAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Aerial Bunched Cables	Kms	144.92	395.56	362.5	706.35	668.38	1229.17	589.23	1166.08	267	893.43	800	1002	273.11	620.26	1020	3429	461	919.41
9	Underground Cables	Kms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Providing Additional LT Poles	nos	700	17.5	800	20	1500	37.5	1200	30	800	20	1100	27.5	600	15	1200	30	1000	25
C. Metering																				
1	Feeder	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Distribution Transformer	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Consumer	Nos	52875	1365	52750	1360	52750	1360	52750	1360	52750	1360	52750	1360	52875	1365	52750	1360	52750	1360
4	Material required for Re- allocation of Energy Meter Outside the consumer premises	Nos	83325	333.3	83325	333.3	83325	333.3	83325	333.3	83250	333	83325	333.3	83325	333.3	83471	333.884	83325	333.3

DHBVN

NAD Data Templates IPDS											
e) Summary – Items & Bill of Quantities (Sum of 3c & 3d):											
Name of the Project Area:											
S. No.	Item	Unit	Narnaul Circle			Rewari Circle			Bhiwani Circle		
			Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)
1	33/11 KV or 66/11 KV SS : New /Additional Tr/Capacity Enhancement	MVA	18.00	0.00	0.00	40.00	12.50	156.25	22.30	47.50	1281.25
2	33/11 KV or 66/11 KV SS : R&M	Nos	18.00	2.00	4.00	4.00	0.00	0.00	2.00	8.24	16.48
3	New 33 KV feeders- New/Bifurcation/Augmentation	Km	1.50	33.00	229.02	21.80	63.00	591.57	20.00	49.00	460.11
4	New 11 KV feeders- New/Bifurcation/Augmentation	Km	106.37	50.50	309.57	136.80	3.90	23.91	104.00	123.00	753.99
5	Distribution Transformer-New	MVA	72.16	14.06	736.80	97.66	4.56	239.05	14.60	3.32	173.86
6	Distribution Transformer-R&M	Nos.	540.00	334.00	50.10	4.10	331.00	49.65	209.00	108.00	16.20
7	Capacity enhancement of LT sub-station	MVA	33.16	0.00	0.00	0.00	0.00	0.00	14.60	53.31	6.66
8	LT Line : New Feeder/ Feeder Bifurcation/Augmentation	Km	45.00	131.77	529.70	255.25	49.17	197.65	170.00	98.33	395.30
9	HVDS	Nos	353/10	135.00	139.05	0.00	0.00	0.00	0.00	0.00	0.00
10	Capacitor Bank	MVAR	4.00	3.60	20.16	16.50	3.60	20.16	0.00	10.80	60.48
11	Aerial Bunched Cables/armoured single core	Km	39.00	8.50	10.63	20.02	4.00	5.00	0.00	0.00	0.00
12	Under-ground cables	Km	3.20	12.17	611.95	36.50	10.30	518.09	0.00	15.00	754.50
13	Rooftop Solar projects	Nos./KV A	0.00	4.00	2.80		20.00	14.00	0.00	0.00	0.00
14	Metering - Feeder/Boundary Point/DT/Consumer	Nos	26082	2977	89.31	14343.00	5476.00	164.28	11850.00	5962.00	178.86
15	Prepaid / smart meters in Govt. establishment	Nos	0.00	175.00	21.00	0.00	81.00	9.72	82.00	82.00	9.84
16	AMI, Smart meters	Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	Consumer meters(Replacement/Relocation/Unmetered)	Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11 KV Switching S/Stn.	Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grand Total				2754.08			1989.33			4107.53

NAD Data Templates IPDS														
e) Summary – Items & Bill of Quantities (Sum of 3c & 3d):														
S. No.	Name of the Project Area: Item	Unit	Palwal Circle			Sirsa Circle			Faridabad Circle			Jind Circle		
			Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)
1	33/11 KV or 66/11 KV SS : New /Additional Tr/Capacity Enhancement	MVA	0.00	0.00	0.00	76.30	4.50	56.25	12.60	7.40	92.50	16.30	10.00	400.00
2	33/11 KV or 66/11 KV SS : R&M	Nos	—	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	28.85	57.70
3	New 33 KV feeders- New/Bifurcation/Augmentation	Km	6.00	40.00	375.60	0.00	63.00	591.57	8.50	8.50	79.82	0.00	33.00	309.87
4	New 11 KV feeders- New/Bifurcation/Augmentation	Km	265.00	138.70	850.23	2.00	17.00	104.21	1643.52	452.20	2776.51	69.00	103.00	632.42
5	Distribution Transformer-New	MVA	126.00	28.45	1490.82	12.70	4.15	217.32	1047.16	49.37	2587.24	455.00	4.16	217.74
6	Distribution Transformer-R&M	Nos.	—	870.00	130.50	0.00	227.00	34.05	0.00	800.00	119.91	183.00	696.00	104.40
7	Capacity enhancement of LT sub-station	MVA	—	3376.32	422.04	0.00	0.00	0.00	0.00	50.47	630.84	18.67	0.00	0.00
8	LT Line : New Feeder/ Feeder Bifurcation/Augmentation	Km	253.00	325.39	1308.07	16.00	38.89	156.32	3652.26	319.04	1282.55	140.00	152.86	582.40
9	HVDS	Nos	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Capacitor Bank	MVAR	0.00	14.40	80.64	0.00	3.60	20.16	0.00	0.00	0.00	0.00	3.60	20.16
11	Aerial Bunched Cables/armoured single core	Km	61.70	22.00	27.50	0.00	17.84	22.30	255.65	94.70	1177.12	23.00	159.80	1217.68
12	Under-ground cables	Km	20.00	6.50	326.95	0.00	8.00	402.40	182.61	35.45	342.45	150.00	1.20	3.14
13	Rooftop Solar projects	Nos./KV A	—	0.00	0.00	0.00	3.00	2.10	0.00	30.00	21.00	0.00	0.00	0.00
14	Metering - Feeder/Boundary Point/DT/Consumer	Nos	78236.00	5.00	0.15	0.00	1810.00	54.30	361921.00	0.00	0.00	3/0/54	5662.00	169.86
15	Prepaid / smart meters in Govt. establishment	Nos	—	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	114.00	5.70
16	AMI, Smart meters	Nos	—	0.00	0.00	0.00	0.00	0.00	0.00	40000.00	5000.00	0.00	0.00	0.00
17	Consumer meters(Replacement/Relocation/Unmetered)	Nos	0.00	44186.70	1325.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11 KV Switching S/Stn.	Nos	0.00	10.20	560.77	0.00	0.00	0.00	0.00	16.99	934.62	0.00	0.00	0.00
	Grand Total				6898.87			1660.98			15044.55			3721.06

NAD Data Templates IPDS											
e)	Summary – Items & Bill of Quantities (Sum of 3c & 3d):										
S. No.	Name of the Project Area: Item	Unit	Hisar Circle			Gurgaon Circle			Grand Total (Amt in Lacs)	Justification	Priority
			Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)	Existing/ Current Position	Qty proposed under IPDS	Cost of qty proposed under IPDS (Rs Lac)			
1	33/11 KV or 66/11 KV SS : New /Additional Tr/Capacity Enhancement	MVA	114.30	16.00	200.00	0.00	25.00	1000.00	3186.25	To reduce the overloading and power cut. To reduce AT&C losses.	1
2	33/11 KV or 66/11 KV SS : R&M	Nos	11.00	25	49.45	0.00	0.00	0.00	127.64	To reduce the damage rate of power transformer and improve continuity of supply.	2
3	New 33 KV feeders- New/Bifurcation/Augmentation	Km	6.00	127.00	1192.53	3.80	0.00	0.00	3830.09	To reduce the overloading of feeders . Provide improved continuity of supply.	3
4	New 11 KV feeders- New/Bifurcation/Augmentation	Km	278.90	195.60	1199.03	620.94	554.70	4263.33	10913.19	To reduce the overloading of feeders. Reduction of AT&C losses & better voltage regulation.	4
5	Distribution Transformer-New	MVA	402.68	29.83	1562.97	2152.00	123.52	6472.23	13698.03	To reduce the overloading of T/F. Provide batter voltage to the consumers	5
6	Distribution Transformer-R&M	Nos.	3424.00	2125.00	318.75	0.00	2336.00	350.40	1173.96	To reduce the damage rate of transformer and provide better electric supply	6
7	Capacity enhancement of LT sub-station	MVA	56.50	0.00	0.00	0.00	0.00	0.00	1059.54	To reduce the power cut during maintainance work	7
8	LT Line : New Feeder/ Feeder Bifurcation/Augmentation	Km	1550.12	279.68	1124.33	2450.51	888.92	4536.85	10113.16	To reduce the technical line losses. To avoid the accidents and provide the better supply to the consumer	11
9	HVDS	Nos	726.00	0.00	0.00	0.00	420.00	550.20	689.25	To reduce AT&C losses	8
10	Capacitor Bank	MVAR	40.40	10.80	60.48	0.00	0.00	0.00	282.24	To improve voltage and reduce overloading	16
11	Aerial Bunched Cables/armoured single core	Km	51.40	80.00	100.00	868.40	271.50	3374.75	5934.97	To reduce the AT&C losses especially in theft prone area.	18
12	Under-ground cables	Km	17.46	8.50	427.55	446.00	201.70	4437.40	7824.43	For provide better electric supply in congested area	17
13	Rooftop Solar projects	Nos./KV A	0.00	200.00	140.00	0.00	40.00	28.00	207.90	For providing the power supply and harness natural energy source	13
14	Metering - Feeder/Boundary Point/DT/Consumer	Nos	202018.00	5733.00	171.99	0.00	0.00	0.00	828.75	To reduce AT&C loss & consumer satisfaction	10
15	Prepaid / smart meters in Govt. establishment	Nos	0.00	399.00	47.88	0.00	822.00	98.64	192.78	For better energy accounting & improve AT&C	15
16	AMI, Smart meters	Nos	0.00	0.00	0.00	0.00	0.00	0.00	5000.00	For better energy accounting & improve AT&C	14
17	Consumer meters(Replacement/Relocation/Unmetered)	Nos	0.00	0.00	0.00	240802.00	52380	1571.40	2897.00	For better energy accounting & improve AT&C	9
18	11 KV Switching S/Stn.	Nos	0.00	0.00	0.00	0.00	16.99	934.62	2430.00	To provide reliable electric supply and also reduce AT&C loss. Better consumer satisfaction.	12
	Grand Total				6594.96			27617.82	70389.17		

ANNEXURE-XI

DHBVN

7.0) Proposed infrastructure (DDUGJY)

Utility wise details of proposed infrastructure in following format (with district wise break up).

The following are the Broad items and the utilities may include/ exclude the items as per their priority

Narnaul Circle							Hisar Circle		Jind Circle		Palwal Circle		Rewari Circle	
S.No	Item		Unit	Qty	Unit Rate (in Lakhs)	Total Amount in Rs. lakhs	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt
A. Feeder Separation														
1	33 KV Feeder		Kms	8.50	9.39	79.82	0.00	0.00	0.00	0.00	0.00	0.00	32.20	302.36
2	11 KV Feeder		Kms	24.80	6.14	152.29	58.78	360.88	7.89	48.46	64.86	398.26	26.31	161.52
3	LT Line		Kms	24.56	4.02	98.73	0.00	0.00	11.22	45.09	200.58	806.33	53.21	213.92
4	Distribution Transformer		MVA	1.88	52.40	98.25	1.64	85.80	1.17	61.35	25.38	1329.88	3.07	160.87
Total						429.09	446.68	154.89	2534.47	838.67				
7.0 (B.) Strengthening of Sub-Transmission and Distribution Network														
S.No	Item		Unit		Unit Rate	Total	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt
1	33/11 KV or 66/11 KV SS :													
	New substation		MVA	40.00	40.00	1600.00	35.00	1400.00	10.00	400.00	50.00	2000.00	40.00	1600.00
	Additional Transformer		MVA	0.00	12.50	0.00	20.00	250.00	20.00	250.00	0.00	0.00	0.00	0.00
	Augmentation Enhancement		MVA	4.00	12.50	50.00	5.70	71.25	4.00	50.00	0.00	0.00	3.70	46.25
2	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations (details of Substations & works to be provided in DPR)	C & R Panel (24 Volts DC O	No	9	1.68	15.13	2	2.75	0.00	0.00	0.00	0.00	9	15.13
		33 KV VCB	No	22	3.26	72.06	4	13.34	0.00	0.00	0.00	0.00	8	26.69
		33 KV Isolator	No	11	0.40	4.58	7	2.62	0.00	0.00	0.00	0.00	9	3.60
		Battery+Charger 24 V DC	No	15	1.35	19.89	8	11.05	0.00	0.00	0.00	0.00	9	12.16
		33 KV L&E Switch	No	8	0.56	4.58	3	1.83	0.00	0.00	0.00	0.00	8	4.58
		11 KV VCB Outdoor/outdoor	No	17	2.95	50.72	18	53.13	0.00	0.00	0.00	0.00	15	43.47
		11 KV VCB O/G I/D	No	61	2.95	181.14	21	62.79	0.00	0.00	0.00	0.00	18	53.13
	VCB=3.3 KV	No	21	2.50	53.21	0	0.00	0.00	0.00	0.00	0.00	6	14.33	
3	33 KV feeders		Km	0.00		0.00				0.00	0.00	0.00	0.00	0.00
	New		Km	0.00	9.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Augmentation		Km	238.20	5.00	1191.00	298.00	1490.00	20.40	102.00	15.00	75.00	132.20	661.00
4	New 11 KV feeders-		Km	0.00		0.00		0.00		0.00	0.00	0.00	0.00	0.00
	New		Km	9.40	6.30	59.19	96.84	610.12	197	1242.96	116.87	736.30	30.44	191.77
	Augmentation		Km	75.16	3.15	236.75	74.03	233.20	217	684.22	281.47	886.64	105.22	331.46
5	Distribution Transformer-100 KVA		Nos.	311	2.35	731.53	296	696.46	603	1416.01		1685.94	205	480.98
	63 KVA		Nos.	655	1.95	1277.16	225	439.02	0	0.00		0.00	205	399.11
6	Distribution Transformer-R&M		Nos.	5800	0.15	870.00	4610	691.50	9787	1468.12	8045	1206.79	2102	315.36
7	LT Line		Km					0.00	0.00	0.00		0.00		0.00
	New	LT Single Core Armoured	Km	142.27	7.62	1084.07	262.95	2003.72	254.89	1942.29	33.91	258.37	90.10	686.58
	Augmentation	(Conductor to Conductor)	Km	0.00	3.81	0.00	110.52	421.09	0.00	0.00	514.96	1961.98	122.80	467.88
8	Capacitor Bank		MVAR	50.40	5.60	282.24	43.20	241.92	61.20	342.72	7.20	40.32	7.20	40.32
9	Aerial Bunched Cables/XLPE (HT)		Km	40.93	12.43	508.82	0.00	0.00	218.60	2717.24	107.40	1335.00	24.56	305.29
	Total			0.00		8292.07		8695.81		10615.55		10186.35		5699.09
7.0(C.) Metering														
S.No	Item		Unit	Total	Unit Rate	Total	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt
1	Feeder Meter		Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Distribution Transformer		Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Consumer (Defective, Electromechanical,	Single Phase	Nos	60000.00	0.02	1200.00	60000.00	1200.00	50000.00	1000.00	65000	1300.00	60000	1200.00
		Three Phase	Nos	1750.00	0.03	52.50	1750.00	52.50	1500.00	45.00	1750	52.50	1500	45.00
Grand Total						1252.50		1252.50		1045.00		1352.50		1245.00
Grand Total						9973.66		10394.99		11815.44		14073.32		7782.76

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7.0) Proposed infrastructure (DDUGJY)

Utility wise details of proposed infrastructure in following format (with district wise break up).

The following are the Broad items and the utilities may include/ exclude the items as per their priority

				Gurgaon Circle		Bhiwani Circle		Faridabad Circle		Sirsa Circle				
S.No	Item		Unit	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Grand Total (Amt in Lac)	Justification	Order of Priority
A. Feeder Separation														
1	33 KV Feeder		Kms	0.00	0.00	18.00	169.02	0.00	0.00	24.80	269.03	820.22	To reduce the overloading of feeders. Provide improved continue of supply	IIIrd (b)
2	11 KV Feeder		Kms	63.32	388.80	155.96	957.58	19.17	117.68	30.58	187.73	2773.19	To reduce the overloading of feeders. Reduction of AT&C losses & better voltage regulation	IVth (b)
3	LT Line		Kms	85.55	343.92	0.00	0.00	21.29	85.57	1.24	5.00	1598.57	To reduce the technical line losses. To avoid the accidents and provide better supply to the consumer	VIIIth (f)
4	Distribution Transformer		MVA	17.09	895.74	0.00	0.00	6.96	364.64	4.92	257.83	3254.36	to reduce the overloading of T/F & provide better voltage to consumer	VIIIth (e)
Total					1628.46		1126.60		567.89		719.59	8446.33		
7.0 (B.) Strengthening of Sub-Transmission and Distribution Network														
S.No	Item		Unit	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt			
1	33/11 KV or 66/11 KV SS :													
	New substation		MVA	30.00	1200.00	20.00	800.00	0.00	0.00	30.00	1200.00	10200.00	To reduce the over loading and power cut, to reduce AT&C losses	Ist
	Additional Transformer		MVA	0.00	0.00	78.00	975.00	0.00	0.00	88.80	1110.00	2585.00		IIInd
	Augmentation Enhancement		MVA	0.00	0.00	0.00	0.00	0.00	0.00	18.90	236.25	453.75		
2	Brief Scope of R&M works in existing 33/11 KV or 66/11 KV substations (details of Substations & works to be provided in DPR)	C & R Panel (24 Volts DC O	No	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	33.01	To reduce the damage rate of Power T/F by prevent the power T/F from havy fault.	VIIIth (d)
		33 KV VCB	No	0.00	0.00	0.00	0.00	0.00	0.00	8	26.69	138.78		
		33 KV Isolator	No	0.00	0.00	0.00	0.00	0.00	0.00	7	2.95	13.75	To reduce outages.	
		Battery+ Charger 24 V DC	No	0.00	0.00	15	19.89	0.00	0.00	6	7.74	70.73		
		33 KV L&E Switch	No	0.00	0.00	0.00	0.00	0.00	0.00	10	5.50	16.50		
		11 KV VCB Outdoor/outdgo	No	0.00	0.00	0.00	0.00	0.00	0.00	16	48.30	195.63		
		11 KV VCB O/G I/D	No	0.00	0.00	8	24.15	0.00	0.00	29	84.53	405.74		
		VCB=3.3 KV	No	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	67.54		
3	33 KV feeders		Km		0.00	0.00	0.00	0.00	0.00	0	0.00	0.00		
	New		Km	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	To reduce the overloading of feeders. Provide improved continuity of supply	IIIrd (a)
	Augmentation		Km	0.00	0.00	302.20	1511.00	0.00	0.00	153.40	767.00	5797.00		
4	New 11 KV feeders-		Km		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	To reduce the overloading of feeders. Reduction of AT&C losses & better voltage regulation	IVth (a)
	New		Km	56.75	357.50	0.00	0.00	11.27	71.03	118.23	744.83	4013.69		
	Augmentation		Km	108.61	342.11	196.54	619.11	57.50	181.12	221.46	697.60	4212.21		
5	Distribution Transformer-100 KVA		Nos.		1806.50	411	965.81		83.69	316	742.63	8609.56	To reduce the overloading of T/F & provide better voltage to consumer	VIIIth (a)
		63 KVA	Nos.		0.00	240	467.76	0.00	0.00	323	629.00	3212.05		
6	Distribution Transformer-R&M		Nos.	1228	184.21	577	86.58	0.00	0.00	5421	813.08	5635.63	To reduce the damage rate and provide better electric supply	
7	LT Line		Km		0.00		0.00		0.00		0.00	0.00	To reduce the technical line losses. To avoid the accidents and provide better supply to the consumer. To reduce the theft in theft prone area.	Vth
	New	LT Single Core Armoured	Km	72.67	553.78	272.20	2074.18	73.50	560.10	109.85	837.04	10000.12		Vth
	Augmentation	(Conductor to Conductor)	Km	534.60	2036.84	0.00	0.00	560.80	2136.66	193.21	736.13	7760.59		VIIIth ©
8	Capacitor Bank		MVAR	0.00	0.00	57.60	322.56	0.00	0.00	14.00	78.40	1348.48	To improve voltage and reduce overloading	Vth
9	Aerial Bunched Cables/XLPE (HT)		Km	46.42	577.00	0.00	0.00	0.00	0.00	67.91	844.13	6287.47	To reduce the AT&C losses	VIIIth (b)
	Total				7057.93		7866.04		3032.60		9611.80	71057.24		
7.0(C.) Metering														
S.No	Item		Unit	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt	Qty	Total Amt			
1	Feeder Meter		Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	Distribution Transformer		Nos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
3	Consumer (Defective, Electromechanical.	Single Phase	Nos	40000	800.00	80000	1600.00	30000	600.00	55000	1100.00	10000.00	For better energy accounting and reduce AT&C losses	VIIIth
		Three Phase	Nos	1750	52.50	1750	52.50	1750	52.50	1500	45.00	450.00		
	Grand Total				852.50		1652.50		652.50		1145.00	10450.00		
	rand Tot:				9538.89		10645.14		4252.99		11476.39	89953.57		

ANNEXURE-XI-A**Details of System Strengthening Plan of Haryana FY 2015-16 to 2017-18**

Category	Schemes involved	Benefits	Basis/Norms
Load Growth	Creation of new substations and associated 33/11kV Lines	<ul style="list-style-type: none"> To meet with the load growth in the area To release new connection of various categories Reduction in the loading on the existing Sub-Stations. Reduction of the AT&C losses of the overloaded system. 	<ul style="list-style-type: none"> The Existing loading of the sub-station is analysed. The Load growth of the sub-station is calculated taking into consideration: <ol style="list-style-type: none"> Load growth on the basis of peak load recorded on AP and other feeders in previous two years to facilitate running of AP feeders in two groups To ensure Reliable power supply to other categories based on load projections. On the basis of load growth worked out and present loading condition of the Sub-Station, Augmentation of existing Sub-Station is proposed if technically feasible other wise creation of new sub-station is proposed near load centre.
	Augmentation of existing substations and associated 33kV Lines	<ul style="list-style-type: none"> To meet with the load growth in the area To release new connection of various categories Reduction in the loading on the existing Sub-Stations. Reduction of the AT&C losses of the overloaded system. 	<ul style="list-style-type: none"> The Existing loading of the sub-station is analysed. The Load growth of the sub-station is calculated taking into consideration: <ol style="list-style-type: none"> Load growth on the basis of peak load recorded on AP and other feeders in previous two years to facilitate running of AP feeders in two groups To ensure Reliable power supply to other categories based on load projections. On the basis of load growth worked out and present loading condition of the Sub-Station, Augmentation of existing Sub-Station is proposed if technically feasible.
Load Growth	Bifurcation / trifurcation of 11kV feeders	<ul style="list-style-type: none"> To achieve voltage regulation at tail end. Reduction in Technical losses due to decrease in length of 11 KV overloaded lines and appropriate size of conductor. Reduction in tripping resulting into increase in reliability of power / consumer satisfaction. 	<ul style="list-style-type: none"> The Voltage of feeder at tail end is analyzed. If the loading of the feeder goes beyond 200 Amps, bifurcation/trifurcation of the feeder is proposed.
	Augmentation of Existing DT and associated LT line	<ul style="list-style-type: none"> To meet with the load growth in the area To release new connection of various categories Reduction in the loading on 	<ul style="list-style-type: none"> Based on the peak load recorded on the existing DTs and the new connections applied in the area. On the basis of the present loading of the Distribution Transformer, existing DT is

Category	Schemes involved	Benefits	Basis/Norms
		the existing Distribution Transformer. • To achieve Steady & desired voltage level.	augmented if feasible else new DT is proposed.
	Providing Additional Distribution Transformer and associated 11kV and LT Line	<ul style="list-style-type: none"> • To meet with the load growth in the area • To release new connection of various categories • Reduction in the loading on the existing Distribution Transformer. • To achieve Steady & desired voltage level. 	<ul style="list-style-type: none"> • Based on the peak load recorded on the existing DTs and the new connections applied in the area. • On the basis of the present loading of the Distribution Transformer, A new DT is proposed if the existing DT cannot be augmented.
AT&C loss reduction	AMR, CMRI and replacement of defective and electromechanical meters	<ul style="list-style-type: none"> • Accurate meter reading from remote locations. • Minimization of human intervention in meter reading. • Timely generation of bills • No blockage of Revenue on account of defective meters 	<p>Meter Reading Technology has been finalized as below :</p> <ul style="list-style-type: none"> • HT Consumers above 50KW: AMR already Provided. • LT consumers between 20KW- 50KW : AMR • DS/NDS/LT Consumers Below 20KW: CMRI/PDS. • Through CMRI all data including energy consumption i.e units consumed takes minimum 7-8 mins. By using PDS only meter reading i.e units consumed can be downloaded which shall take less than a minute per consumer. However, in suspicious cases all data can be downloaded through CMRI. • Prepaid metering / smart metering for Govt. Institutions.
AT&C loss reduction	Shifting of meters outside the consumer's premises and at reasonable height for proper reading	<ul style="list-style-type: none"> • Effective curbing of pilferage of energy by unauthorized consumers. • Accurate recording of energy consumption. • Avoidance of meter tampering 	<ul style="list-style-type: none"> • In urban & Semi-urban areas meters are to be shifted outside the consumer premises and installed at outer wall (preferably) or nearby pole. • In rural areas, the meters shall be shifted outside consumer premises in meter boxes such as 1-in-1, 2-in-1, 4-in-1 & 6-in1 and in extreme cases 20-in-1 meter pillar boxes. • LT conductor would also be replaced with AB cable in theft prone areas.
	Replacement of Bare Conductor by LT AB Cable in theft prone areas	<ul style="list-style-type: none"> • To mitigate direct hooking on the LT System. 	Only in theft prone and rural areas.
	Replacement of Undersized Conductors / outlived or worn out Conductors on feeders with frequent breakdowns	<ul style="list-style-type: none"> • Reduction in Technical losses due to replacement by appropriate size of conductor. • Reduction in tripping resulting into increase in reliability of power/consumer 	<ul style="list-style-type: none"> • Provision of 80 – 100 Sqmm conductor in City areas • Existing conductors can be changed as per the requirements in phases

Category	Schemes involved	Benefits	Basis/Norms
		satisfaction.	
Reliability Enhancement	Installation of Automatic Power Factor Correction Panels at 11kV Sub-Stations	<ul style="list-style-type: none"> Improvement in Power Factor of the feeders Improvement in Voltage profile of the feeders 	<ul style="list-style-type: none"> Power factor shall be as near to 1 as possible.
	Distribution Automation and SCADA	<ul style="list-style-type: none"> Effective Monitoring of power flow of the Utility Improvement in Response time Real time Data Accurate system data for better network planning 	<ul style="list-style-type: none"> Is a way forward. Requires Huge Expenditure and hence can be taken up in phases after completion of substation automations and 100% meter downloading /AMR.

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a) Creation of New 33kV Sub-stations

Sl. No.	Name of Circle	FY 2015 - 16				Approved for FY 2016-17		Approved for FY 2017-18	
		Ongoing (Spillover)		Works to be awarded		Nos.	MVA	Nos.	MVA
		Nos.	MVA	Nos.	MVA				
1	Ambala	0	0.0	0	0.0	0	0.0	0	0.0
2	Jhajjar	3	28.0	3	37.5	3	30.0	0	0.0
3	Kaithal	4	60.0	2	20.0	4	60.0	10	202.5
4	Karnal	8	114.3	1	10.0	1	10.0	7	80.0
5	Kurukshetra	0	0.0	1	10.0	0	0.0	3	47.5
6	Panipat	5	52.5	1	10.0	2	32.5	12	197.5
7	Rohtak	1	20.0	2	20.0	3	30.0	3	30.0
8	Sonepat	5	60.0	12	135	2	22.5	7	80.0
9	Yamunanagar	3	40.0	0	0.0	0	0.0	0	0.0
	Total	29	374.8	22	242.5	15	185	42	637.5

Note:- In Ambala and Yamunanagar almost 98% area is covered with 66/11kV belt.

b) Augmentation of existing 33kV Sub-stations

Sl. No.	Name of Circle	Approved for FY 2015-16		Approved for FY 2016-17		Approved for FY 2017-18	
		Nos.	MVA	Nos.	MVA	Nos.	MVA
1	Ambala	0	0.0	0	0.0	0	0.0
2	Jhajjar	4	19.2	2	20.0	0	0.0
3	Kaithal	7	53.0	6	56.0	8	58.7
4	Karnal	7	47.7	6	35.7	24	127
5	Kurukshetra	2	14.0	3	25.7	8	59.5
6	Panipat	4	40.5	2	22.5	19	167.4
7		2	13.7	5	50.0	4	16.2
8		8	52.7	0	0.0	25	194
9	Nanagar	0	0.0	0	0.0	0	0.0
	Total	34	240.8	24	209.9	88	622.8

The Circle Wise detail for the Sub-stations works to be carried out is as below:-

a) Ongoing projects for creation of 33 kV substations (Spillover) to be executed in FY 2015-16

Sl. No.	Name of Circle	Name of 33 kV S/Stn.	Capacity (in MVA)	Likely Date of Completion
1	Jhajjar	Sehlanga	1 x 10	30.06.15
		Chhuchhakwas	1 x 6.3/ 8	30.06.15
		Malikpur	1 x 10	19.10.15
2	Kaithal	Pabnawa	1 x 10	30.06.15
		Kithana	2 x 10	19.10.15
		Deod Kheri	1 x 10	19.10.15
		Duserpur	2 x 10	19.10.15
3	Karnal	Guniana	1 x 6.3	30.06.15
		Sonkra	2 x 10	30.06.15
		Gagsina	1 x 10	30.06.15
		Seedpur	1 x 10	19.10.15
		Rattak	1 x 10	19.10.15
		Nissing (Revival)	2 x 12.5	19.10.15
		Nidana	2 x 12.5	19.10.15
		Madhuban	1 x 8	30.04.15
4	Panipat	Indl. Area, Model Town	1 x 12.5	30.06.15
		Nohra	1 x 10	19.02.16
		Sanoli Kalan	1 x 10	
		Nara	1 x 10	19.10.15
		Seenkh	1 x 10	19.10.15
5	Rohtak	PGIMS Rohtak	2 x 10	30.06.15
6	Sonapat	Bhainswal Kalan	1 x 10	30.04.15
		Madina	1 x 10	Work terminated and work is to be awarded at risk & cost of the firm
		Khanpur Khurd (Baroda)	1 x 10	
		Sohti	1 x 10	30.06.15
		Nandnaur	2 x 10	30.06.15
7	Yamunanagar	Thimo	1 x 10	30.06.15
		Ledi	1 x 10	30.06.15
		Mirjapur	2 x 10	30.06.15

b) New 33 kV substations approved for FY- 2015-16 whose NIT is to be floated.

Sl. No.	Name of Circle	Name of 33 kV S/ stn.	Capacity (in MVA)	
1	Jhajjar	Parnala / Line Par Bahadurgarh	1 x 12.5	12.5
		Sector-6, Jhajjar	1x12.5	12.5
		Sector-9 Bahadurgarh	1x12.5	12.5
2	Kaithal	Devbon	1x10	10.0
		Arnoli	1x10	10.0
3	Karnal	New Medical College	1x10	10.0
4	Kurushetra	Lohar Majra	1 x 10	10.0
5	Panipat	Noorpur Muglan	1 x 10	10.0
6	Rohtak	Kharak Kalan	1 x 10	10.0
		Bahu Akbarpur	1 x 10	10.0
7	Sonapat	Busana	1 x 10	10.0

Sl. No.	Name of Circle	Name of 33 kV S/ stn.	Capacity (in MVA)	
		Sheikhpura	1 x 10	10.0
		Jakholi	1 x 10	10.0
		Barota	1 x 10	10.0
		Jind Road Gohana	1x10	10.0
		Rukhi	1x10	10.0
		Ganaur	1x10	10.0
		Rai	1 x 10	10.0
		Sector-23 Sonapat	1x12.5	12.5
		Safiabad	1x12.5	12.5
		Hassanpur	1x10	10.0
		Sersa	2x10	20.0
TOTAL				242.5

c) **New 33 kV substations approved for FY 2016-17**

Sl. No.	Name of Circle	Name of 33 kV substation	Capacity	
1	Jhajjar	Dadanpur	1x10	10
		Baadsa	1x10	10
		Kulana	1x10	10
2	Kaithal	Sector 18 Kaithal	2x10	20
		Kharodi	2x10	20
		Jadola	1 x 10	10.0
		Sirsal	1 x 10	10.0
3	Karnal	Butankheri	1X10	10
4	Panipat	Anaj Mandi (Panipat)	2x10	20
		Sector-13-17 HUDA Part-II Panipat	1x12.5	12.5
5	Rohtak	Ismaila	1x10	10
		Nidana	1x10	10
		I.I.M. Sunaria	1x10	10
6	Sonapat	Sector-7, Sonapat	1x12.5	12.5
		Nahra	1x10	10
TOTAL				185

d) **New 33 kV substation for FY 2017-18**

Sl. No.	Name of Circle	Name of New proposed 33 kV substation	Proposed Capacity (in MVA)	
1	Kaithal	Gorian	2x12.5	25
		Kharkan	2x10	20
		Bhoona	2x12.5	25
		Jamba	2x10	20
		Dussain	2x10	20
		Manjheri	2x12.5	25
		Badsikri	1x12.5	12.5
		Durana	1x10	10
		Pilni	2x10	20
		Theh Newal	2x12.5	25
2	Karnal	Jundla	1x10	10.0
		Bir Amin	1x10	10.0
		Fafrana	1x10	10.0
		Chogama	1x10	10.0

Sl. No.	Name of Circle	Name of New proposed 33 kV substation	Proposed Capacity (in MVA)	
		Bandrala	1x10	10.0
		Bal Pabana	1x10	10.0
		Gharaunda	2x10	20
3	Kurukshetra	Daulatpur	2x12.5	25
		Sector-8, Kurukshetra	1x12.5	12.5
		Mandi	1x10	10
4	Panipat	Raja Kheri	2x10	20
		Barsat Road	1x12.5	12.5
		Garh Sarnai	1x12.5	12.5
		Garhi Chajju	1x12.5	12.5
		Balana	2x10	20
		Pardhana	2x10	20
		Risalu	2x10	20
		Diwana	2x10	20
		Kandra	1x10	10
		Mehrana	1x10	10
		Saudapur	2x10	20
		Sondapur	2x10	20
5	Rohtak	Ladhot	1x10	10
		Bainsi	1x10	10
		Mokhra	1x10	10
6	Sonapat	Devru	1x12.5	12.5
		Udesipur	1x10	10
		Deepalpur	1x12.5	12.5
		Mehmudpur	1x10	10
		Juan	1x10	10
		Sector-6, Sonapat	1x12.5	12.5
		Jagdishpur	1x12.5	12.5
Total				637.5

e) Augmentation of existing 33 kV substations approved for FY 2015-16

Sl. No.	OP Circle	Name of 33 kV substation	Capacity to be augmented		MVA Added
1	Jhajjar	33 kV Dubaldhan	1x8	1x12.5	4.5
		33 kV Dhandlan	1x8	1x12.5	4.5
		33 kV Sampla Road Jhajjar	1x8	1x12.5	4.5
		33 kV Sasrouli	6.3/8+6.3	2x10	5.7
2	Kaithal	33 kV Keorak	2x6.3/8	2x10	4.0
		33 kV Teek	6.3/8+5	2x10	7.0
		33 kV Songri Guliyana	10	2x10	10.0
		33 kV Sangan	2x8	2x10	4.0
		33 kV Sirta	1x10	2x10	10.0
		33 kV Kathwar	1x10	2x10	10.0
		Badsui	10+8	10+8 to 2x8+10	8
3	Karnal	33 kV Gheer	3x4	2x10	8.0
		33 kV Biana	8	8+10	10.0
		33 kV Sitamai	8	8+10	10.0
		33 kV Sector-12	2x10	2x12.5	5.0
		33 kV Sector-6	2x10	2x12.5	5.0

Sl. No.	OP Circle	Name of 33 kV substation	Capacity to be augmented		MVA Added
		33 kV Old Power House	2x8	2x10	4.0
		33 kV Buddenpur	8+6.3	2x10	5.7
4	Kurukshetra	33 kV REC Kurukshetra	4+5+10	2x12.5	6.0
		Adhoya	10	10 to 10+8	8
5	Panipat	33 kV S/S Jalalpur	1x10	2x10	10.0
		33 kV S/S Old Indl Area Panipat	1x12.5	2x12.5	12.5
		Babail	10	10 to 2x10	10
		Ahar	6.3/8+10	6.3/8+10 to 2x6.3/8+10	8
6	Rohtak	33 kV Sec-1 Rohtak	6.3+10	10+12.5	6.2
		33 kV Jhajjar Road Rohtak	2x5+6.3	5+12.5+6.3	7.5
7	Sonapat	33 kV Butana	6.3+8	10+8	3.7
		33 kV Sec-13	10	2x10	10.0
		33 kV Sec-15	10	2x10	10.0
		33 kV Rajpur	10	2x10	10.0
		33 kV Kheri Gujjar	8	1x10	2.0
		33 kV Bhogipur	2x8	2x10	4.0
		33 kV Sardhana	8+10	8+10+5	5.0
		Engg. College Murthal	6.3/8	6.3/8 to 2x8	8
				Total	240.8

f) Augmentation of existing 33 kV substations approved for FY 2016-17

Sl. No.	OP Circle	Name of 33 kV substation	Capacity to be augmented		MVA Added
1	Jhajjar	33 kV Surya Roshni Bahadurgarh	1x10	2x10	10.0
		33 kV Sector-2, Jhajjar	1x10	2x10	10.0
2	Kaithal	33 kV Harnola	1 x 10	2x10	10.0
		33 kV Urlana	1x8	2x10	12.0
		33 kV Mahmoodpur	1x8	2x10	12.0
		33 kV Jagdishpura	1x10	2x10	10.0
		33 kV Kutubpur	1x10	2x10	10.0
		Cheeka	6.3/8+10	6.3/8+10 to 2x10	2
3	Karnal	33 kV Barsat	2x10	2x12.5	5.0
		33 kV Kutail	6.3/8+6.3	6.3/8+10	3.7
		33 kV Nagla Megha	5+6.3	10+6.3	5.0
		33 kV Dacher	8+10	2x10	2.0
		33 kV Newal	1x10	2x10	10.0
		33 kV Kalaram	1x10	2x10	10.0
4	Kurukshetra	33 kV Sandhola	1x8	10+8	10.0
		33 kV Guldera	1x8	10+8	10.0
		33 kV Jhansa	6.3+8	2x10	5.7
5	Panipat	33 kV S/S Babarpur	1x8	8+10	10.0
		33 kV S/S Mini Sectt Panipat	1x12.5	2x12.5	12.5
6	Rohtak	33 kV N.G.M. Rohtak	10	2x10	10.0
		33 kV Ritoli	10	2x10	10.0
		33 kV Farmana	10	2x10	10.0
		33 kV I.D.C. Rohtak	2x5+8	5+12.5+8	7.5
		33 kV OPH	10	10+12.5	12.5
				Total	209.9

g) Augmentation of 33 kV substation for FY 2017-18

Sl. No.	Name of Circle	Name of the existing 33 kV substation	Existing Capacity (in MVA)	Proposed Capacity (in MVA)	MVA Added
1	Kaithal	Pharal	6.3/8+8	6.3/8+8 to 6.3/8+8+12.5	12.5
		Mundri	8+10	8+10 to 2x12.5	7
		Paprala	2x6.3/8+5	2x6.3/8+5 to 2x6.3/8+10	5
		Kwartan	6.3+10	6.3+10 to 12.5+10	6.2
		Budha Khera	4+10	4+10 to 12.5+10	8.5
		Kheri Gulam Ali	2x10	2x10 to 2x12.5	5
		Keorak	2x10 (FY 2015-16)	2x10 to 3x10	10
		Karora	10+8	10+8 to 10+12.5	4.5
2	Karnal	Brass	8+10	8+10 to 12.5+10	4.5
		Dachar	6.3/8+10 to 2x10(2016-17)	2x10 to 10+12.5	2.5
		Garhi Birbal	2x10 (2014-15)	2x10 to 10+12.5	2.5
		Seedpur	10	10 to 20	10
		Salwan	2x10	2x10 to 10+12.5	2.5
		Shahpur	10	10 to 10+8	8
		Kohand	2x10	2x10 to 10+12.5	2.5
		Dadlana	8	8 to 10+8	10
		Kaimla	2x10	2x10 to 2x12.5	5
		Meerut Road	2x10	2x10 to 2x12.5	5
		HSIIDC Karnal	2x10	2x10 to 2x12.5	5
		Kutail	10+8	10+8 to 2x10	2
		Manjura	2x10	2x10 to 10+12.5	2.5
		Gullarpur	10	10 to 10+8	8
		Sheikhupura	10	10 to 10+8	8
		Chochra	10	10 to 10+8	8
		Padha	10+8	10+8 to 10+12.5	4.5
		Staundi	5+10	5+10 to 2x10	5
		Raipur Jattan	10	10 to 10+8	8
		Barota	10	10 to 10+8	8
		Thal	2x6.3/8	2x6.3/8 to 2x10	4
		Rambha	2x10	2x10 to 2x12.5	5
		Shamgarh	10+8	10+8 to 10+12.5	4.5
		Nigdhu	10+8	10+8 to 2x10	2
3	Kurukshetra	KDB	10	10 to 2x10	10
		Jhansa Road	6.3/8+10	18 to 26	8
		Soodpur	10	10 to 10+6.3/8	8
		Khanpur	2x6.3 + 6.3/8	20.6 to 25.1	4.5
		Barna	2x10	2x10 to 2x12.5	5
		Nassi	1x6.3/8	1x6.3/8 to 6.3/8+10	10
		Ismailabad	2x5	2x5 to 2x8	6
		Neemwala	10	10 to 10+8	8
4	Panipat	Dikadla	2x6.3+10	2x6.3+10 to 28.8	6.2
		Chadia	2x10	2x10 to 2x10+5	5
		Sector-29, Part-II	2x12.5	2x12.5 to 3x12.5	12.5
		Naultha	2x10	2x10 to 2x10+6.3	6.3
		Mandi	2x10	2x10 to 3x10	10

Sl. No.	Name of Circle	Name of the existing 33 kV substation	Existing Capacity (in MVA)	Proposed Capacity (in MVA)	MVA Added
		Urlana	8 to 2x10 (2016-17)	2x10 to 3x10	10
		Nara	1x10 (2014-15)	10 to 2x10	10
		Bapoli	8+10	8+10 to 8+2x10	10
		Atta	1x10	1x10 to 2x10	10
		Machhrauli	1x10	1x10 to 10+12.5	12.5
		Beholi	2x6.3+10	2x6.3+10 to 3x10	7.4
		Kabri	29.3 to 35 (2014-15)	35 to 50	15
		Babarpur	8+10 (2016-17)	8+10 to 10+12.5	4.5
		Nohra	6.3/8(2014-15)	6.3/8 to 6.3/8+10	10
		Jattal	10 to 20 (2014-15)	2x10 to 3x10	10
		Dahar	8+10	8+10 to 12.5+10	4.5
		Sanoli Road	2x12.5	2x12.5 to 3x12.5	12.5
		Brahman Majra	2x8	2x8 to 10+12.5	6.5
		Dharamgarh	10+8	10+8 to 10+12.5	4.5
5	Rohtak	Kahanaur	2x6.3	2x6.3 to 6.3+8	1.7
		Bhallout	5+6.3/8	5+6.3/8 to 10+6.3/8	5
		Jindran	8	8 to 8+5	5
		Rohad	8+10	8+10 to 10+12.5	4.5
6	Sonapat	Sugar Mill	8+10	8+10 to 10+12.5	4.5
		Sardhana	18	18 to 20	2
		Kheri Gujjar	10	10 to 20	10
		Shekhpura	10	10 to 20	10
		Barota	18	18 to 22.5	4.5
		Rai	10	10 to 22.5	12.5
		Umedgarh	18	18 to 20	2
		Kheri Begga	18	18 to 20	2
		Gannaur	10	10 to 20	10
		Hassanpur	10	10 to 22.5	12.5
		Khwera	18	18 to 20	2
		Jakholi	10	10 to 22.5	12.5
		Sector-23, Sonapat	12.5	12.5 to 2x12.5	12.5
		Ferozpur Bangar	18	18 to 20	2
		Sohti	10	10 to 22.5	12.5
		Kathura	14.3	14.3 to 16	1.7
		Jind Road Gohana	10	10 to 22.5	12.5
		Sargathal	10	10 to 20	10
		Sikanderpur Majra	18	18 to 22.5	4.5
		Sector-7, Sonapat	12.5	12.5 to 2x12.5	12.5
		Sector-13, Sonapat	2x10	2x10 to 2x12.5	5
		Sector-15, Sonapat	2x10	2x10 to 2x12.5	5
		Safiabad	12.5	1x12.5 to 2x12.5	12.5
		Nahra	10	1x10 to 10+12.5	12.5
		Sersa	2x10	2x10 to 2x10 + 6.3	6.3
				Total	622.8

Construction of 33kV Lines:-

To change the feeding end of 33kv existing Sub-Stations with the new 132kV of 220kV sub-stations following works are being executed and planned to be carried over the period of three years.

- a) Ongoing works for construction of 33kV Lines:-

Length of 33kV line to be erected (in Km)	Cost (in Rs Cr)	Funding Agency
81.2	4.48	REC

- b) Planned works for construction of 33kV Lines:-

Length of 33kV line to be erected (in Km)	Cost (in Rs Cr)	Funding Agency
159.25	12.74	DDUGJY/IPDS /REC/JICA etc.

The bifurcation of feeders is also a regular ongoing process in UHBVN. As and when the load on the feeders is more than 200 Amps it is taken under plan to bifurcate the feeder. The ongoing works and future planning over a period of three years in respect of bifurcation of feeders is detailed as below:-

Ongoing Bifurcation of feeders in FY 2015-16

Sl. No.	Name of Circle	No. of feeders to be bifurcated	Cost (in Rs Cr)	Funding Agency
1	Yamuna Nagar	9	1.53	REC
2	Kurukshetra	8	1.36	
3	Kaithal	50	8.50	
4	Rohtak	7	1.19	
5	Sonipat	24	4.08	
Total :		98	16.66	

No. of overloaded 11kV feeders to be bifurcated planned upto FY 2017 – 18

Sl. No.	Name of Circle	No. of feeders to be bifurcated	Cost (in Rs Cr)	Funding Agency
1	Yamuna Nagar	55	12.80	JICA
2	Kurukshetra	62	8.66	
3	Kaithal	176	31.48	
4	Rohtak	5	1.95	
5	Sonipat	57	8.51	
6	Ambala	41	6.87	
7	Karnal	145	26.04	
8	Panipat	88	11.28	
9	Jhajjar	17	0.92	
Total :		646	108.51	

Note:- Number of feeders are likely to be revised as per the field conditions.

DHBVN

A. Creation of New 33kV Sub-stations

Sl. No.	Name of Circle	FY 2015-16 (U/Const.)		Approved for FY 2016-17		Approved for FY 2017-18	
		Nos.	MVA	Nos.	MVA	Nos.	MVA
1	Hisar	3	40	17	180	15	157.5
2	Jind	2	30	8	107.5	18	180
3	Sirsa	2	20	15	152.5	10	110
4	Bhiwani	3	40	9	92.5	9	130
5	Narnaul	2	30	6	60	13	145
6	Gurgaon	0	0	5	60	0	0
7	Palwal	2	20	3	50	7	80
8	Rewari	1	20	5	50	6	80
9	Faridabad	0	0	0	0	0	0
	Total	15	200	68	752.5	78	882.5

B. Augmentation of existing 33kV Sub-stations

Sl. No.	Name of Circle	Approved for FY 2015-16		Approved for FY 2016-17		Approved for FY 2017-18	
		Nos.	MVA	Nos.	MVA	Nos.	MVA
1	Hisar	15	73.6	4	16.7	3	25.7
2	Jind	11	35	3	17	2	12
3	Sirsa	9	49.4	7	34.9	16	118.4
4	Bhiwani	10	53.9	2	5.7	10	90.5
5	Narnaul	8	36.9	4	16.6	2	4
6	Gurgaon	0	0	0	0	0	0
7	Palwal	0	0	0	0	0	0
8	Rewari	1	3.7	0	0	2	16.2
9	Faridabad	0	0	0	0	0	0
	Total	54	252.5	20	100.9	35	266.8

A. Ongoing projects for creation of 33 kV substations to be executed in FY 2015-16

Sl. No.	Name of Circle	Name of Sub-station	Capacity (In MVA)	Likely Date of Completion
1	Hisar	Sector-14, HUDA, Hisar	10	15.07.2015
		Old Power House Tohana	10	20.09.2009
		Ratio	20	05.06.2015
2	Jind	Sindhwi Khera	20	31.12.2015
		Gatouli	10	24.06.2015
3	Bhiwani	Mandhana	10	30.09.2015
		Norangbas Jattan	10	31.12.2015
		I/Area, Bhiwani	20	30.10.2015
4	Sirsa	Chautala	10	30.09.2015
		Sec-19, HUDA, Sirsa	10	Terminated PCI against TED-166
5	Narnaul	Dhakora (Asrawas)	20	30.11.2015
		Nawan	10	Terminated PCI against TED-166
6	Rewari	Kharkhra	20	Terminated PCI against TED-166
7	Palwal	Raoli(Agon)	10	Terminated PCI against TED-166
		Ghata Samsabad/Hirwari	10	Terminated PCI against TED-166

B. New 33 kV substations approved for FY 2016-17.

Sl. No.	Name of Circle	Name of Sub-station	Capacity	
1	Bhiwani	Pajju	1x10	10
		Roopgarh	1x10	10
		Sohansara	1x10	10
		Mithi	1x10	10
		Bishalwas	1x10	10
		Khera (Near Siwani)	1x10	10
		BTM Road Bhiwani	1x12.5	12.5
		33 KV substation Jui	1x10	10
		Near Digawan Jattan	1x10	10
2	Hisar	Kheri Lochab	1x10	10
		Jamalpur	1x10	10
		Chaudhriwas	1x10	10
		Dhansu/ Auto Market	1x12.5	12.5
		Sec-1&4, Hisar	1x12.5	12.5
		Kharak Punia	1x10	10
		Shakarpura	1x10	10

Sl. No.	Name of Circle	Name of Sub-station	Capacity	
		Gorakhpur	1x10	10
		Old Power House Dharsul	1x10	10
		Hamjapur	1x10	10
		Dhir (Boswal)	1x10	10
		Bhattu Sottar	2x10	20
		Bangaon	1x10	10
		33 kV Babanpur Dhani	1x10	10
		HUDA Sec-3, Fatehabad	1x10	10
		Shekhupur	1x10	10
		Hukmawali	1x5	5
3	Narnaul	Akoda	1x10	10
		Shyampura	1x10	10
		Malra	1x10	10
		Nangal Dargu	1x10	10
		Pali	1x10	10
		Sundrah	1x10	10
4	Sirsa	Bahiya	1x10	10
		Chormar	1x10	10
		Kheowali	1x10	10
		Kurangawali	1x10	10
		Mallewala	1x10	10
		Bupp	1x10	10
		Darba	1x10	10
		Mangalia	1x10	10
		Damdama	1x10	10
		Jiwan Nagar	1x10	10
		Bajekan	1x10	10
		Kelnia	1x10	10
		Moju Ki Dhani	1x10	10
		Patti Kirpal	1x10	10
		Dabwali	1x12.5	12.5
5	Rewari	Nehrugarh	1x10	10
		Balawas Ahir	1x10	10
		Mohanpur	1x10	10
		Subaseri	1x10	10
		Kamalpur	1x10	10
6	Jind	Bulliyan wali	1x10	10
		Desh Khera	1x10	10
		Dhanouri	1x10	10
		Dhamtan	1x10	10
		Mangalpur	1x10	10
		Sector-8, Jind	2x12.5	25
		HAMETI	1x12.5	12.5
		Sangatpura	2x10	20

Sl. No.	Name of Circle	Name of Sub-station	Capacity	
7	Gurgaon	Badshapur	2x10	20
		Mau	1x10	10
		Sec-57 (Part-I) Gurgaon	1x10	10
		Sec-57 (Part-I) Gurgaon	1x10	10
		Panchgaon	1x10	10
8	Palwal	Rathiwas	2x10	20
		Ghasera	1x10	10
		Silani	2x10	20
Total				752.50

C. New 33 kV substations for FY 2017-18.

Sl. No.	Name of Circle	Name of New proposed 33 kV substation	Proposed Capacity (in MVA)	
1	Narnaul	Kotia (New)	1x10	10
		Surethi (New)	1x10	10
		Kojinda (New)	1x10	10
		Dewas (New)	1x10	10
		Dhanoda	1x10	10
		Hudina	1x10	10
		Nimbhi	1x10	10
		Tehla	1x10	10
		Neerpur Rajput	1x10	10
		HUDA Narnaul	2x12.5	25
		HUDA Mohandergarh	1x10	10
		Khairana	1x10	10
		Katkai	1x10	10
2	Bhiwani	Dhani Daryapur	2x10	20
		Bapora-II	2x12.5	25
		Samaspur	1x10	10
		Sanwar	1x10	10
		HUDA Sec, Dadri	2x12.5	25
		Noonsar	1x10	10
		Bamla (Bhiwani-Rohtak Road)	1x10	10
		Surpur Kalan	1x10	10
		Dagroli	1x10	10

Sl. No.	Name of Circle	Name of New proposed 33 kV substation	Proposed Capacity (in MVA)	
3	Jind	Khatkar (New)	1x10	10
		HUDA Sector, Safidon (New)	1x10	10
		Ikkas (New)	1x10	10
		Kabarchha (New)	1x10	10
		Uchana Kalan (new)	1x10	10
		Uchana Khurd (new)	1x10	10
		Ujjana (New)	1x10	10
		Retoli (New)	1x10	10
		Sandil (New)	1x10	10
		Kharanti (New)	1x10	10
		Barta	1x10	10
		Kurar	1x10	10
		Koel	1x10	10
		Khera Khemwati	1x10	10
		Bohatwala	1x10	10
		Hatho	1x10	10
		Khokhri	1x10	10
		Durana	1x10	10
4	Hisar	Talwandi Rana	1x10	10
		Kaimari / HAU	1x12.5	12.5
		Sector 9 & 11	1x12.5	12.5
		Sector 16 & 17	1x12.5	12.5
		Jhandli Kalan	1x10	10
		Hanspur	1x10	10
		Phoolan	1x10	10
		Rozanwali	1x10	10
		Babanpur	1x10	10
		Mamupur	1x10	10
		Jalania	1x10	10
		Noorki	1x10	10
		Karnoli	1x10	10
		Ratta Khera	1x10	10
		Bisla	1x10	10
5	Sirsa	Baruwali	1x10	10
		Arniawali	1x10	10

Sl. No.	Name of Circle	Name of New proposed 33 kV substation	Proposed Capacity (in MVA)	
		Kanganpur	2x10	20
		Goriwala	1x10	10
		Sangar Sarita	1x10	10
		Nathore	1x10	10
		Chakkan	1x10	10
		Bakrianwali	1x10	10
		Aboobshahar	1x10	10
		Kariwala	1x10	10
6	Rewari	Sector-18 Rewari.	1x12.5	12.5
		Sec.-19, Rewari	2x12.5	25
		Near Nangal Mundi	1x10	10
		I/Area-II, Dharuhera	1x12.5	12.5
		Dharan.	1x10	10
		Bhandor.	1x10	10
7	Palwal	Indri	2x10	20
		Dhuawat	1x10	10
		Bubalheri	1x10	10
		Biwan/Basai	1x10	10
		Rethat	1x10	10
		Attitka	1x10	10
		Hassanpur	1x10	10
Total				882.50

D. Augmentation of existing 33 kV substations approved for FY 2015-16.

Sl. No.	Name of Circle	Name of Sub-station	Capacity to be augmented		MVA Added
1	Jind	33 KV substation Kakroad	5+6.3/8	10+6.3/8	5
		33 kV substation Chatter	6.3/8+6.3	6.3/8+10	3.7
		33 kV substation Alewa	2x6.3/8	6.3/8+10	2
		33 kV substation Shree Rag Khera	2x6.3/8	6.3/8+10	2
		33 kV substation Ramrai	2x6.3/8	6.3/8+10	2
		33 KV substation Gangoli	4+6.3/8	10+6.3/8	6
		33 kV substation Ramrai	2x6.3/8	6.3/8+10	2
		33 kV substation Shamdo	6.3/8+10	2x10	2
		33 kV substation Pipaltha	2x6.3/8	6.3/8x10	2
		33 kV substation Pipaltha	10+6.3/8	2x10	2
		33 kV substation Gurusar	6.3/8	6.3/8 + 6.3	6.3
2	Hisar	33kV substation Sisai	2x6.3/8	6.3/8+10	2
		33kV substation Barwala Road Hansi	6.3/8	6.3/8 + 10	10
		132 kV substation Sec-27/28, Hisar	2	6.3/8	6
		33kV substation HTM	6.3/8+6.3	10+6.3	2
		33kV substation Pirthala	6.3+10	2x10	3.7
		33kV substation Gullarwala	6.3/8 + 10	2x10	2
		33kV substation Rainwali	6.3/8 + 10	2x10	2
		33kV substation Badopal	10+5	2x10	5
		33kV substation Baliyala	6.3/8+5	6.3/8 + 10	5
		33kV substation Birdana	10	2x10	10
		33kV substation Mehmadi	5+6.3/8	10+6.3/8	5
		33kV substation Nanheri	10	10+6.3	6.3
		33kV substation Degoh	2x6.3/8	10+6.3/8	2
		33kV substation Kamana	10	10+6.3	6.3
		33kV substation Alalwas	10	10+6.3	6.3
3	Bhiwani	33 kV Substation Mandhi	2x4+6.3+5	4+6.3/8+6.3+5	4
		33 kV Substation Budhera	10	10+6.3/8	8
		33 kV Substation Pataudi	10	10+6.3	6.3
		33 kV Substation Gopalwas	10	10+6.3	6.3
		33 kV Substation Chehar Kalan	10	10+6.3	6.3
		33 kV Substation Makrana	10+5	2x10	5
		33 kV Substation Tosham	2x4+6.3	6.3/8+4+6.3	4
		33 kV Substation Isharwal	6.3/8+6.3	6.3/8+10	3.7
		33 kV Substation Dawarka	10+4	10+6.3/8	4
		33 kV Substation Alampur	10	10+6.3	6.3
4	Sirsa	33 kV Substation Kalanwali	2x6.3/8 + 6.3	2x6.3/8+10	3.7
		33 kV Substation Kusumbi	6.3/8+6.3	6.3/8+10	3.7
		33 kV Substation Farwain	4+6.3/8	10+6.3/8	6
		33 kV Substation Baragudha	2x6.3/8	6.3/8+10	2
		33 kV Substation Resalia Khera	10	2x10	10
		33 kV Substation Dholpalia	10	10+6.3/8	8

Sl. No.	Name of Circle	Name of Sub-station	Capacity to be augmented		MVA Added
		33 kV Substation Nathusari	4+6.3/8	10+6.3/8	6
		33 kV Substation Panihari	10	10+6.3/8	8
		33 kV Substation Shadianwali	6.3/8	10	2
5	Narnaul	33 KV substation Sehlang	6.3/8	6.3/8 + 6.3	6.3
		33 kV Substation Majra	10	10+6.3	6.3
		33 kV Substation Barda	10+5	10+4+5	4
		33 kV Substation Satnali Bass	10	10+6.3	6.3
		33 kV Substation Bhojawas	12.5+6.3	12.5+10	3.7
		33 kV Substation I/Area, Narnaul	10+6.3/8	2x10	2
		33 kV Substation Budeen	10	10+6.3	6.3
		33 kV Substation Zerpur	6.3/8	10	2
6	Rewari	33 KV substation JC-I Gudiyani	6.3	10	3.7
Total					252.5

E. Augmentation of existing 33 kV substations approved for FY 2016-17.

Sl. No.	Name of Circle	Name of Sub-station	Capacity to be augmented		MVA Added
1	Jind	Kheri Taloda	10+5	2x10+5	10
		Chatter	8+10	2x10	2
		Danonda	10+5	2x10	5
2	Hisar	Bass	10	2x10	10
		Karandi	2x6.3/8	2x6.3/8+10	10
		Leherian	6.3+5	2x6.3/8	4.7
		Dhani Raipur	2x6.3/8	10+6.3/8	2
3	Bhiwani	Sector 13 Bhiwani	6.3/8+10	2x10	2
		Local BTM Bhiwani	6.3	10	3.7
4	Sirsa	kuttabad	10	10+6.3	6.3
		Dhani Kahan Singh	6.3/8	10	2
		Dhotter	10	2x10	10
		Ottu	10	10+6.3	6.3
		Haripura	10	10+6.3	6.3
		Ahemdpur rd. Sirsa	6.3/8+10	2x10	2
		Old Site Sirsa	6.3/8+10	2x10	2
5	Narnaul	Khatoti Khurd	10+6.3	10+2x6.3	6.3
		Lehroda	10+6.3/8	2x10	2
		Bhungarka	10	10+6.3	6.3
		Dublana	10+6.3/8	2x10	2
Total :					100.9

F. Augmentation of existing 33 kV substations approved for FY 2017-18.

Sl. No.	Name of Circle	Name of the existing 33 kV substation	Existing Capacity (in MVA)	Proposed Capacity (in MVA)	MVA Added
1	Jind	Kheri sher Khan	10+6.3/8	2x10	2
		Balerkhan	10	2x10	10
2	Hisar	Gorakhpur	10	2x10	10
		Ratta Khera	10	2x10	10
		Lochchab	6.3/8+6.3	2x10	5.7
3	Bhiwani	Nagina Canal	10+6.3	10+6.3+6.3/8	8
		Khanak	10+6.3/8	10+2x6.3/8	8
		Singhani	10	10+6.3/8	8
		Bardu Chaina (near Dighawan Jattan)	10	2x10	10
		Pokharwas	10	10+6.3/8	8
		Lohani	10+6.3/8	10+2x6.3/8	8
		Chhapar	10	2x10	10
		Chandwas	10	10+6.3/8	8
		Dagroli	10	2x10	10
		BTM, Bhiwani	12.5	2x12.5	12.5
4	Sirsa	Pipli	10	10+6.3/8	8
		I.A.Sirsa	10+6.3/8	10+12.5	4.5
		Ellenabad(s)	10+6.3/8+6.3	3x10	5.7
		Kuttabad(s)	10+6.3	2x10+6.3	10
		Desu Jodha	10	10+6.3/8	8
		Kharia	10+6.3	2x12.5	8.7
		Bansudhar	10	2x12.5	15
		Mallewala	10	10+5	5
		Bupp	10	10+5	5
		Jamal	10	2x10	10
		Kagdana	10	10+6.3	6.3
		Darbi	10+6.3	2x10	3.7
		Ding	10+6.3/8	10+12.5	4.5
		Mastangarh	10	2x10	10
		Dholpalia	10+6.3/8	2x10+6.3/8	10
		Farwain	10+6.3/8	10+6.3/8+4	4
5	Narnaul	Nizampur	10+6.3/8	2x10	2
		Garhi Mahesar	10+6.3/8	2x10	2
6	Rewari	Gudiyani	6.3	10	3.7
		I/Area Dharuhera	12.5	2x12.5	12.5
Total					266.8

DAKSHIN HARYANA BIJLI VITARAN NIGAM (DHBVN)
STATUS OF PROPOSED GROWTH IN DISTRIBUTION NETWORKS OF DHBVN

Particulars	Status of FY 2014-15	During FY 2015-16	Cumulative up to FY 2015-16	During FY 2016-17	Cumulative up to FY 2016-17	During FY 2017-18	Cumulative up to FY 2017-18	During FY 2018-19	Cumulative up to FY 2018-19
AT&C loss reduction plan									
<i>Procurement of single phase meters for replacement of defective meters and release of new connections.</i>	0	345000	345000	146031	491031				
	0	345000	345000	147774	492774				
Procurement of three phase meters for replacement of defective meters and release of new connections.	0	100000	100000	30044	130044				
	0	150000	150000	49182	199182				
	0	3114282	3114282	969539	4083821				
LT Connectivity of already executed HVDS works.	0	107	107		107				
Power Factor Improvement (Providing automatic power factor correctors)	0	0	0		0				
Load Growth schemes	0	0	0	0	0				
Creation of new 33 kV sub-stations & Erection of new associated 33KV & 11 KV lines	0	27	27	100	127				
Augmentation of existing 33 kV sub-stations	0	56	56	30	86				
Augmentation of existing 33 kV lines	0	335	335	1114	1449				
Bifurcation of 11 kV feeders (Work of	0	1277	1277	1486	2763				

Particulars	Status of FY 2014-15	During FY 2015-16	Cumulative up to FY 2015-16	During FY 2016-17	Cumulative up to FY 2016-17	During FY 2017-18	Cumulative up to FY 2017-18	During FY 2018-19	Cumulative up to FY 2018-19
bifurcation of feeders, augmentation of ACSR)									
Material required for release of Non-AP connections & replacement of old assets	0	0	0	0	0				
Procurement of power transformers and allied equipment such as 33 kV CTs, 33 kV PTs, 33 kV and 11 kV VCBs, 33 kV Control and Relay Panels etc.	0	0	0	0	0				
Release of Tube well connection on turnkey basis	0	5574	5574	4507	10081				
Release of BPL connections under RGGVY schemes	0	17488	17488		17488				
Electrification work in bastis being developed under Mahatma Gandhi Gramin Basti Yojna (MGGBY)	0		0		0				
R-APDRP schemes and other miscellaneous works	0	0	0		0				
Implementation of R-APDRP (Part-A), including SCADA	0	20	20		20				
Implementation of R-APDRP (Part-B)	0	14	14	16	30				

Particulars	Status of FY 2014-15	During FY 2015-16	Cumulative up to FY 2015-16	During FY 2016-17	Cumulative up to FY 2016-17	During FY 2017-18	Cumulative up to FY 2017-18	During FY 2018-19	Cumulative up to FY 2018-19
Relocation of energy meters of DS & NDS consumers outside their premises in Meter Pillar boxes.	0	147798	147798	40509	188307				
Civil Works	0	22	22	24	46				
System Strengthening Works under IBRD loan and IBRD equity	0	0	0	0	0				
Under IBRD Loan	0	5	5		5				
Under IBRD Equity	0	0	0		0				
Scaling of IT infra in non - RAPDRP area	0	0	0		0				
Revamping of existing Meter Testing labs. at Dadri, Sirsa, Hisar, Faridabad & Gurgaon	0	5	5		5				
Maintenance free earthing using 'Ground Enhancing Material for Distribution Transformers, Meter Pillar Boxes and H-pole etc.	0	21565	21565	20915	42480				
Providing RF Meters.	0	0	0		0				
AMR on large NDS & LT consumers having load about 10 kW (IBRD funded work).	0	17000	17000	54000	71000				
New Work: SCADA	0	0	0	0	0				
Any other works	0	60421	60421	5156	65577				

List of commissioned renewable energy projects in Haryana

Sl. No.	Site	Capacity (MW)	Year of commissioning	MW for which PPA signed with HPCC
A	SOLAR			
1.	Village-Nandha, Distt.Bhiwani by M/s C&S Electric Ltd., New Delhi	1	FY 2011-12	1
2	Village-Balsamand, Distt. Hisar by M/s SDS Solar Pvt Ltd, New Delhi	1	FY 2011-12	1
3	Village-Silarpur Mehta, Distt. Mahendergarh by M/s Chandraleela Power Energy (P) Ltd., Jaipur	0.8	FY 2011-12	0.8
4.	Village-Panchnota, Distt. Mahendergarh by M/s Zamil New Delhi Infra Structure (P) Ltd.Gurgaon	1	FY 2011-12	1
5.	Village- Bhadoar, Distt. Panchkula by M/s VKG Energy Pvt. Ltd.,Panchkula	1	FY 2011-12	1
6.	Village- Nigana, Distt. Rohtak by M/s HR Minerall & Alloys Pvt. Ltd. New Delhi	1	FY 2011-12	1
7.	Village-Sarakpur, Distt. Panchkula by M/s Tayal & Company,Mohali	1	FY 2011-12	1
8.	Village-Gumthala, Distt. Sirsa by M/s Sukhbir Solar Energy Pvt. Ltd. Distt. Ferozepur(PB),	1	FY 2011-12	1
9.	NTPC, Vill Jharmeri, Faridabad	5	FY 2013-14	-
10	Siwana Solar Energy , Village Mithi, Distt. Bhiwani	5	FY 2014-15	5
11	Maruti Udyog, Manesar, District Gurgaon	1	FY 2014-15	-
	S. TOTAL	18.80		12.8
B	BAGASSE COGENERATION			
1	Ch.Devi Lal Co-operative Sugar Mill Ltd., Gohana (Export: 2.0MW)	6.00	FY 2003-04	2
2	The Sonapat Cooperative Sugar Mill Ltd., Sonapat (Exp: 1.00 MW)	3.00	FY 2004- 05	-
3	The Meham Cooperative Sugar Mill, Rohtak (Exp: 1.80/2.0 MW)	5.00	FY 2007-08	2
4	The Rohtak Cooperative Sugar Mill, Rohtak (Exp 12.00 MW)	16.00	FY 2009-10	12
5	The Shahbad Cooperative Sugar Mill, Kurukshetra (Exp: 16/18 MW)	24.00	FY 2009-10	18
6.	The HAFED Cooperative Sugar Mill, Asandh, Karnal (Exp 2 MW)	6.00	FY 2010-11	2
7.	The Piccadily Agro Industries, Bhadso, Karnal	17	FY 2010-11	-
	S. TOTAL	77.00		36
C	BIOMASS COGENERATION			
1.	M/s EICL Ltd. (Bharat Starch Industries) Yamuna Nagar	2.00	FY 2008-09	-
2.	M/s Sainsons Paper Industries, Village-Bakhli, Pehowa, Distt, Kurukshetra	3.00	FY 2009-10	-
3.	M/s Shri. Vishnu Overseas Pvt. Ltd., Kaithal	1.5	FY 2010-11	-
4.	M/s R.P Basmati Rice Ltd, Karnal	0.5	FY 2010-11	-
5.	M/s Sunstar Overseas Ltd, GT Road, Behlgarh, Sonapat	1.95	FY 2010-11	-
6.	M/s REI Agro Ltd, (Unit-II) Bawal Growth Centre, Jaliawas, Rewari	2.5	FY 2010-11	-

Sl. No.	Site	Capacity (MW)	Year of commissioning	MW for which PPA signed with HPCC
7.	M/s Best Food International (P) Ltd, Village Norata, Tehsil Indri, Karnal	4.00	FY 2010-11	-
8.	M/s Kayem (PAN) Foods Industries (P) Ltd., G.T.Road, Panipat	0.5	FY 2011-12	-
9.	M/s Satyam Industries Pvt. Ltd, Village Pardhana, Tehsil Israna, Panipat	3.00	FY 2011-12	-
10.	M/s Goel International Pvt. Ltd. Taraori, Karnal	3.00	FY 2011-12	-
11.	M/s REI Agro Ltd, (Unit-I) Bawal Growth Centre, Jaliawas, Rewari	3.00	FY 2011-12	-
12.	M/s SSA International Ltd., Village Bhodwal Majri, Samalkha, district Panipat	1.06	FY 2012-13	-
13.	M/s NV Distilleries Limited, Badhouli, Naraingarh, Ambala	2.10	FY 2012-13	-
14.	M/s Best Food International (P) Ltd, Village Norata, Tehsil Indri, Karnal	6.00	FY 2012-13	-
15.	M/S ADS Spirits Pvt.Ltd., Vill: Bhitian, Teh: Beri, Jhajjar	2.30	FY 2013-14	-
16.	M/s NV International, Badhouli, Naraingarh, Ambala	4.00	FY 2014-15	-
17.	M/s Haryana Liquars, Jundala, Distt. Karnal	2.50	FY 2014-15	-
18.	M/s Shaktibhoj.... Ltd. Samana Bahu,, Karnal	3.50	FY 2014-15	-
19.	Other Miscellaneous Projects	8.90	FY 2014-15	
	S. TOTAL	55.31		-
D. BIOMASS POWER PROJECTS				
1	M/s Nuchem Ltd, Tohana, Fatehabad	4.00	FY 1993-94	-
2	M/s Starwire (India) Ltd., New Delhi-110024, at Vill. Khurawata, block & dist. Mahendergarh	9.90	FY 2013-14	9.90
3.	M/s Sri Jyoti Renewable Energy Pvt. Ltd. Hyderabad at Village Dhana Narsan, distt. Bhiwani	9.50	FY 2014-15	9.50
4	Biomass power by GEMCO energy ltd at Bhiwani, Haryana	8	FY 2014-15	8
5	A B Grain Naraingarh, Ambala	8	FY 2014-15	5
	Total	39.40		32.4
E. BIOGAS BASED POWER PROJECTS				
1.	M/s Ashoka Distilleries & Chemicals Pvt. Ltd,Gehlab Road, Hathin, Faridabad	1	FY 2010-11	-
2.	M/s Globus Spirits Limited, Samalkha, District Panipat	3	FY 2010-11	-
3	Dera Sacha Sauda, Sirsa	0.12	FY 2011-12	-
4.	M/s Utsuk Dairy Pvt. Ltd., Village Saharava, Hisar	0.02	FY 2012-13	-
	S. TOTAL	4.14		-
F. SMALL HYDRO				
1.	Tajewala, Yamuna Nagar (By HPGCL)	3 X 16 2 X 7.2	FY 1986-89 FY 2005-06	62.4
2.	Kakroi, Sonapat by HPGCL (already phased out) 0.3MW	-	FY 1987-88	-
3.	Dadupur, Dist. Yamuna Nagar by M/s Bhoruka Power Corporation Ltd., Bangalore	6.00	FY 2009-10	6

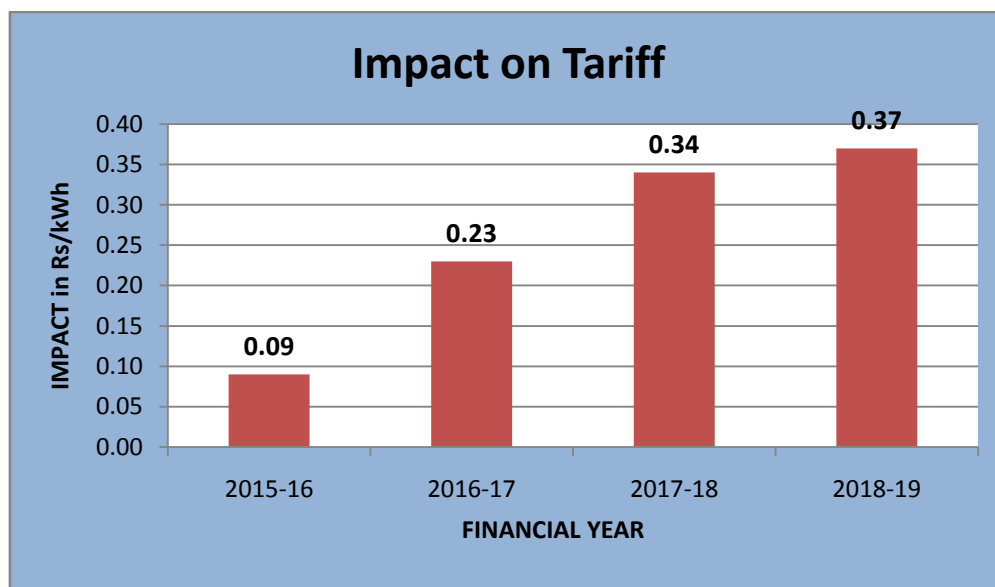
Sl. No.	Site	Capacity (MW)	Year of commissioning	MW for which PPA signed with HPCC
4.	WJC Main Branch Gogripur (RD 96000) Distt. Karnal by M/s P&R Engineering Services, Chandigarh	2.00	FY 2010-11	2
5.	Musapur, Indri, Karnal Augmentation Canal SHP by Puri Oil Mills, Delhi	1.4	FY 2011-12	1.4
6.	Khukni, Karnal Augmentation Canal SHP by Puri Oil Mills, Delhi	1.4	FY 2011-12	1.4
	S. TOTAL	73.2		73.2
G.	BIOMASS GASIFIER BASED PROJECTS			
1,	M/s Chanderpur Works,Village-Jorian, Yamuna Nagar Delhi Road,Yamuna Nagar	0.1	FY 2004-05	-
2.	M/s Hari Metal Industries, Darshan Nagar, Durga Garden Jagadhari, Yamuna Nagar	0.1	FY 2005-06	-
3.	M/s S.D.Udyog, Near FCI Godown, Jagadhari, District Yamuna Nagar	0.1	FY 2006-07	-
4.	The RETREAT,TERI), Village-Gwal Pahari, Gurgaon	0.1	FY 2006-07	-
5.	Shivashakti Food Products, Plot No. 29, HSIDC, Hisar Road,Sirsa	0.3	FY 2007-08	-
6.	Maxrich Foods Pvt. Ltd.,Village-Nagla, Meerut Road, Karnal	0.5	FY 2007-08	-
7.	Shorewalla Roller Flour Mill, Village Batta, Hisar Road, Distt. Kaithal	0.3	FY 2007-08	-
8.	M/s Zenith Energy, Delhi-Hisar Highway, Hansi, Distt. Hisar	0.1	FY 2007-08	-
9.	M/s Goodrich Carbohydrates, Village-Nagla, Distt. Karnal	0.6	FY 2008-09	-
10	M/s Super Die Castings, Faridabad	0.36	FY 2009-10	-
11	M/s Starlit Power Systems Ltd., Indri Road, Village-Atta, Sohna near Gurgaon, Haryana 122103	0.18	FY 2013-14	-
12	M/s Chanderpur Renewal Power Company, Hemamajra Road, Mulana, Ambala	1.0	FY 2014-15	-
	S. TOTAL	3.74		-
	GRAND TOTAL (MW)	267.49		154.7

ANNEXURE-XIII**Average Billing Rate**

Sl. No	Description	Rate (Rs/unit)	FY 2015-16		FY 2016-17		FY 2017-18		FY 2018-19	
			MU	Rs Crores	MU	Rs Crores	MU	Rs Crores	MU	Rs Crores
1	Domestic	4.2	8263	3770	9525	4345	10976	5007	12641	5767
2	Other than domestic	4.65	31114	15715	34226	17287	37648	19015	41413	20917
	Total		39377	19485	43751	21632	48624	24022	54054	26684
	Weighted Average ABR			4.95		4.94		4.94		4.94

Impact on Tariff

Impact on the Tariff due to new investment proposed has been worked out and summarized in the tables below:



PARTICULARS	UNIT	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Total energy requirement at state periphery	MU	51900	56350	61379	66821
Net sales-Power/Unit of input power	Rs/kWh	2.15	2.22	2.25	2.28
Total Income	Rs/kWh	2.15	2.22	2.25	2.28
Expenditure					
Transmission charges	Rs/kWh	0.03	0.04	0.05	0.06
Power Purchase	Rs/kWh	2.05	2.03	1.97	1.88
Employee cost	Rs/kWh	0.06	0.09	0.11	0.14
R & M Cost	Rs/kWh	Incl.	Incl.	Incl.	Incl.
Administration & General expenses	Rs/kWh	0.01	0.01	0.01	0.02
Others	Rs/kWh	-0.08	-0.08	-0.07	-0.07
Total expenses	Rs/kWh	2.07	2.09	2.07	2.03
Interest	Rs/kWh	0.15	0.31	0.45	0.55
Depreciation	Rs/kWh	0.02	0.05	0.07	0.07
Return on Equity @16%	Rs/kWh	0.02	0.03	0.02	0.00
Tax	Rs/kWh	0.00	0.00	0.00	0.00
Net Impact	Rs/kWh	0.09	0.23	0.34	0.37