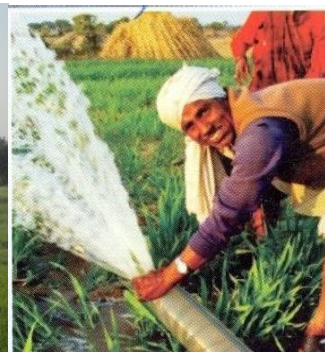


24X7 POWER FOR ALL MADHYA PRADESH

*A Joint Initiative of Government of India and
Government of Madhya Pradesh*





Government of India



Piyush Goyal

Union Minister of State (IC)

Power, Coal, New & Renewable Energy

Foreword

Electricity consumption is one of the most important indices that decide the level of development 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.

Madhya Pradesh is also among the fastest growing States in the country. This joint initiative of Government of India and Government of Madhya Pradesh 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 of the State.

I compliment the Government of Madhya Pradesh and wish them all the best for implementation of this programme. The Government of India will complement the efforts of Government of Madhya Pradesh in bringing uninterrupted quality power to each household and establishment in the State. Adequate power supply to agricultural sector as per the policy of the State Government is also an integral part of 24x7 Power For All (PFA) Road Map Document.



Government of
Madhya Pradesh



Shivraj Singh Chouhan Chief Minister of Madhya Pradesh

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.

It is a matter of great satisfaction that the State of Madhya Pradesh is already providing 24 hours supply to all electricity consumer in the State. Going forward to achieve 100% household electrification will support in enrichment of lives of citizens and will also help in inclusive growth by positively impacting education, awareness, health and economic development of isolated tribal and rural areas in the State.

The Government of Madhya Pradesh has taken all necessary steps in terms of capacity addition, power procurement, strengthening the Transmission & Distribution network, energy efficiency measures, consumer centric initiatives, following best practices in implementation of different ongoing schemes, reduction in aggregate technical & commercial loss and filing of timely tariff petition to make the distribution companies financially viable.

In tune with this, 24x7 Power for All programme is a step forward in this direction. It is an excellent platform to assess the actual requirement of power by FY 2018-19 and formulate an integrated strategy under all three wings of power sector i.e. Distribution, Transmission & Generation.

The State Governments will continue to provide all necessary support to the power utilities in achieving various milestones and targets outlined in this PFA Roadmap. The State shall endeavor to make best use of its locational advantage and availability of natural resources not only to meet its internal demand for power but also to emerge as the power hub of the country.

I would like to thank the Government of India, Hon'ble Prime Minister and Hon'ble Union Minister of State for Power, for implementation of '24 x 7 Power for All' programme in the State of Madhya Pradesh.



Government of India



Government of Madhya Pradesh

Joint Statement

24X7 Power for All programme is already being implemented in the State of Madhya Pradesh with active support from the Government of India. The Program aims at further enhancing the quality of supply and satisfaction level by providing electricity access to all unconnected households in the State.

This PFA Roadmap document highlights all-encompassing power sector interventions including generation, transmission, distribution, renewable energy and energy efficiency/DSM measures proposed to be implemented during FY16 to FY19.

The Government of Madhya Pradesh shall continue to support the power sector through targeted capital subsidy schemes aimed at supporting the poor and marginal consumers and elimination of regional disparities in the State.

The State Government is committed to support the utilities and other development agencies engaged in the power sector in implementation of the various measures and

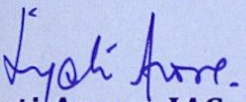
targets considered in the PFA Roadmap.

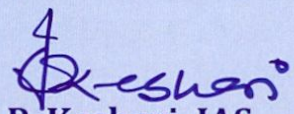
The State Government will put in place appropriate State level governance mechanisms for periodic review and monitoring of the PFA Roadmap implementation.

The Ministry of Power, GoI would supplement the efforts of State on various issues to be dealt with at the Central Government level including those listed in this document. The MoP, GoI shall also endeavor to support the State in availing concessional financing arrangements for power utilities in the State and enhance the grants under DDUGJY, IPDS & PSDF.

The State Government shall endeavor to support utilities in improving their financial sustainability and credit worthiness.

The Central and State Governments would meet regularly over the next four years to review and monitor the progress on the rollout plan and strive to achieve the objectives of the program by taking the necessary steps as envisaged in the PFA document.


Jyoti Arora, IAS
Joint Secretary 12/4/2016
Ministry of Power (GoI)


I.C.P. Keshari, IAS
Principal Secretary, Energy
Government of Madhya Pradesh

EXECUTIVE SUMMARY

24x7 Power for All (24x7 PFA) is a Joint Initiative of Government of India (GoI) and State Governments with the objective to provide 24x7 power for all households, industry, commercial businesses, public needs, any other electricity consuming entity and adequate power to agriculture sector by FY 19. This roadmap document aims to meet the above objectives for the State of Madhya Pradesh.

Madhya Pradesh is one of the largest States of India. From 544 kWh in FY 11 to 739 kWh in FY 15, the per capita consumption of electricity in the State has been growing at a CAGR of 7.95%. However, it remains well below the national average of 1010 kWh per capita in FY 15. The major reason for low per capita consumption is huge tribal region in the State..

CONNECTING THE UNCONNECTED

Execution of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) is still in progress in the State. However, according to projections (keeping census projections as sacrosanct), there were 52,86,204 un-electrified households in the State at the end of FY 15.

The State has targeted to electrify these households from FY 16 to FY 19. Of these households yet to be electrified, 1,44,222 (about 3%) households are in urban areas.

FEEDER SEGREGATION

Under DDUGJY the State has been sanctioned Rs. 825.49 Crores for segregation of agricultural feeders, which would facilitate in providing 24x7 power supply to rural households with reduced losses. Any further

assistance if required shall be sought by the State during the course of implementation.

24 X 7 SUPPLY

The state is already supplying 24 hours power to all its consumers except agricultural which are given adequate supply of 10 hours. These supply hours shall be maintained by the state for future years as well.

GROWTH IN DEMAND

In order to achieve the objective of 24 x 7 power for all, the State would need to fully meet the increase in peak demand from 9598 MW (at state periphery in FY 15) to 12,643 MW in FY 19 with corresponding increase in energy requirement from 55,622 MU in FY 15 to 80,847 MU in FY 19.

The demand for future has been worked out by estimating the urban and rural household consumption after taking into account the growth in number of electrified households on one hand and the growth in average consumption per day per household on the other. Individual category-wise growth rate equal to the past years' CAGR has been considered for all non-domestic consumer categories.

SUPPLY ADEQUACY

At end of FY 15 the firm availability in terms of available capacity for the State is 15,190 MW (excluding share from unallocated Central quota). With such capacity the state is already having surplus power.

MP Genco provides about 5237 MW (34%) of the total followed by 3731 MW (25%) by CGS. About 7% of total available capacity is

contributed by renewable energy (RE) sources.

In order to meet the increasing demand in the future, the State has already planned additional capacity of 8,204 MW from own generating stations and allocations from Central generating stations besides sourcing power from private generating stations and renewable energy sources in a phased manner by FY 19. The State is also planning to enhance the capacity of its existing power plants through RM&U schemes.

With the planned capacity addition and achievement of targeted loss levels the State is expected to remain in surplus power situation till end of FY 19.

ADEQUACY OF TRANSMISSION NETWORK

With the peak demand projected to rise to 12,643 MW and energy requirement projected at 80,847 MU by FY 19, commensurate capacity addition in the inter-state and intra-state transmission systems have been planned.

PGCIL has planned to increase the transformation capacity at 765/400 kV voltage level from 22,000 MVA to 23,500 MVA and at 400/220 kV voltage level from 5985 MVA to 11,245 MVA. MPPTCL is planning to double its transformation capacity at 400/220 kV level.

Keeping in view that the capacity at 220 kV level and below is used entirely to meet the demand within the state, which is projected to grow from the existing level of 9598 MW to 12,643 MW projected in FY 19, an increase of 32%, the planned increase in capacity at x/33 kV (x=220; 132) at 44% seems to be adequate. Also the total capacity addition at y/132kV (y= 220;400) has been planned to increase by around 43%.

A load flow study was done in October, 2015. It simulated FY 19 conditions in the network, considering an estimated peak demand of 13,465 MW, comfortably higher than the demand projected in this study. This demand is met by 5,180 MW supplied by the state's own generation capacity and the balance of 8,285 MW from MP's share in central generating stations and its share from independent power plants (IPPs) in the state. The study found eight 132 kV and two 220 kV lines would be overloaded in FY 19 conditions. MPPTCL have already planned requisite measures to remedy the situation.

ADEQUACY OF DISTRIBUTION NETWORK

The State has estimated that it will need Rs. 15,161 Crores for strengthening of electricity distribution network in rural and urban areas from FY 16 to FY 19. This includes funding from Central schemes (IPDS & DDGJUY).

The State plans to add 7,077 MVA capacity at 33/11 kV level, 12,355 MVA at DT level and plans creation of additional network of 8,387 Ckt Kms, 1,00,779 Ckt Kms and 61,096 Ckt Kms of 33 kV, 11 kV and LT lines respectively.

The existing distribution network with planned additions is considered adequate to meet the projected peak load conditions.

But its implementation depends heavily on the timely availability of funding support to the State. The State will take necessary steps to complete the planned works within their respective scheduled time frames.

State has already achieved the target level of 100% collection efficiency. The aggregate technical & commercial (AT&C) losses are also projected to be reduced in line with

trajectory agreed with the Central Government:

Discom	AT&C Loss	
	FY 15	FY 19
West	22.27%	16.27%
Central	25.30%	19.30%
East	21.59%	15.59%
Total	23.07%	17.00%

Under DDUGJY scheme the State has sought financial assistance of Rs. 8472 Crores, against the same an amount of only Rs. 2865 Crores has been sanctioned to the State.

Madhya Pradesh covers over 7% of countries population and 9% of total area. Whereas it has been sanctioned only 5% of the budgeted outlay for DDUGJY in the country.

It is requested that the grant component may be enhanced by at least Rs. 1720 Crores i.e. total of Rs. 2867 crore additional sanctioned amount to achieve the target of 100% electrification in rural areas and the poor financial health of the Discoms shall continue.

CLEAN ENERGY INITIATIVES

By end of March, 2015 the state had a renewable generation capacity of around 1020 MW.

State is also exploring more renewable energy potential, and it is anticipated that around 4867 MW of renewable capacity will be added in the state till end of FY 17 (combined for private and government projects). Considering that the state already

has surplus power capacity such hugely planned renewable capacity addition would add on to the cost for State. It is requested that an appropriate subsidy may be allowed to the state to add renewable energy capacity.

FINANCIAL TURNAROUND

Distribution utilities in the State are showing a net loss of Rs 4,950 Crores during FY 15 with accumulated financial losses of Rs. 28,777 crore. The accumulated financial losses will increase to Rs. 61,723 Crores in the FY 19 in case of no tariff hike takes place till end of FY 19, but will start earning operating profit by FY 19 through a tariff hike of 8.09% each year from FY 17 to FY 19.

With tariff hike of 5% in FY 17 and 0% in subsequent two years, the accumulated losses for the Discoms shall reach to Rs. 55,617 Crores.

However, a hike of 8.45% every year is required to start earning operating profit in FY 19 if the proposed investments are funded through Equity and FIIs/World Bank etc. instead of IPDS and DDUGJY.

In case the Discoms miss the target AT&C losses by 1% the required tariff increase would be 8.53% each year from FY 17 to FY 19 to start earning profit.

Based on the above considerations, a roadmap to achieve '24x7 Power for All' targets has been formulated and detailed in the report.

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CHAPTER 1: INTRODUCTION

Power sector is a critical infrastructure element for growth of an economy. The availability of reliable, quality and affordable power is vital for rapid growth in agriculture, industry and for overall economic development of a state. For this an efficient, resilient and financially healthy power sector is an essential requirement for growth of a state and economic empowerment of the common man.

Under the Indian Constitution, electricity is a concurrent subject. As per Electricity Act 2003, it is the duty of a distribution licensee to develop and maintain an efficient, coordinated and economical distribution system in the mandated area of supply as well as to supply electricity in accordance with the provisions contained in the Act. The State Electricity Regulatory Commission (SERC), as per the provisions of the act, specifies and enforces the standards with respect to quality and reliability of supply by licensees and also monitors the performance of distribution companies (Licensees) on the basis of notified performance standards.

OBJECTIVES AND KEY OUTCOMES OF THE 24X7 POWER FOR ALL – JOINT INITIATIVE

The 24x7 Power for All (24x7 PFA) is a Joint Initiative of Government of India (GoI) and Government of Madhya Pradesh (GoMP) 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 farm holdings.

Towards this goal the 24x7 PFA initiative seeks to:

- i. Ensure reliable 24x7 supply to consumers within a period of four years of commencement of the program. The hours of supply for agriculture consumers will be decided by the State Government as per requirement.
- ii. Ensure that all unconnected households are provided access to electricity in a time bound manner in the next four years i.e. by end of FY 19.
- iii. Ensure adequate capacity addition planning and tie ups for power from various sources at affordable price to meet the projected power demand in future.
- iv. Strengthen the transmission and distribution network to cater to the expected growth in demand of existing as well as future consumers.
- v. Assess the financial measures including optimizing investments and undertaking necessary balance sheet restructuring measures to ensure liquidity in the finances of the utility.
- vi. Put in place a strategy to ensure reduction of AT&C losses as per the agreed loss reduction trajectory and methodology and steps required to be taken at every level of distribution.
- vii. Identify steps for implementation and adoption of modern technologies to monitor reliability of supply.
- viii. Identify steps for monitoring timely commissioning of various generating plants and transmission and distribution infrastructure to meet the expected growth in demand.

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

This document is an action plan drawn to achieve the above aims and objectives. The plan will be executed by the Government of Madhya Pradesh with the support of Government of India, wherever necessary, as per their approved plans, schemes and policies.

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

The plan aims at the following:

- (1) bridging the gap between the demand and supply for the already identified/registered consumers and other consuming entities,
- (2) connecting the unconnected households and unconnected farm holdings.

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 five years.
- 2) Projection of demand of commercial, industrial and agriculture consumers based again on past data and historical CAGR recorded during the past five years.
- 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) Draw up a broad plan to meet power demand in future through

- ✓ State's own upcoming generation resources.
- ✓ Allocation from upcoming central sector power plants
- ✓ Quantum for additional procurement required.

- 6) Assess the additional energy requirement for continued 24x7 power supply to all households in the state as well as to other consumer categories and determine financial implications on utilities for procuring additional energy and its implication on tariff.

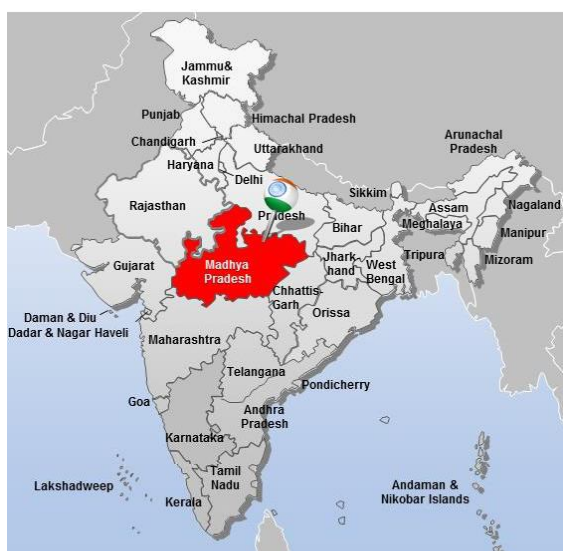
- 7) Assess the adequacy of the network - both inter-state and intra state transmission as well as distribution so as to meet the increased / expected / projected power requirement of all consumer categories of the state.

- 8) To incorporate futuristic initiatives like smart grid, energy efficiency measures etc.

- 9) Conduct sensitivity analysis for cost of service and resulting financial gap under multiple scenarios, namely, tariff hike, reduction in power procurement cost and increase in interest and moratorium period and AT&C loss reduction, etc.

- 10) Set monitorable targets to achieve the goal of 24x7 Power for All in a cost effective manner to the consumers of the state.

CHAPTER 2: FACTS ABOUT MADHYA PRADESH



Key Statistics	
Area	3,08,252 sq.km
Districts	51
Inhabited Villages	51,929
Population	7,26,26,809
Number of households	Census 2011
- Electrified	1,00,44,644
- Un-Electrified	49,22,953
GSDP 2013-14 over previous year	11.08%
Number of Domestic consumers	85,80,244
Available Capacity (March, 2015)	15,190 MW (Including share in CS, IPPs and JV)
Peak Demand (FY 15)	9870 MW (During 2014-15)

Madhya Pradesh with an area of 3,08,252 sq.km is the second largest state in India occupying 9.38% of country's area. It is a part of peninsular plateau of India lying in north central part, whose boundary can be classified in the north by the plains of Ganga-Yamuna, in the west by the Aravali, east by the Chhattisgarh plain and in the south by the Tapti valley and the plateau of Maharashtra. Madhya Pradesh is also among the fastest growing states in the country. At current prices, the gross state domestic product (GSDP) of Madhya Pradesh for FY 15 was US\$ 84.27 billion. Between FY 05 and FY 15, the CAGR for GSDP was 12.83 per cent.

Madhya Pradesh has a population of around 7.26 crore (Rural: 5.26 crore & Urban: 2.01 crore) as per the Census 2011 with 72% of the population residing in villages whose main occupation is agriculture, while the rest of the population lives in towns. The

tribes of Madhya Pradesh constitute over 20% of the state's population and are mainly concentrated in southwestern and eastern parts of the State.

The state is bestowed with mineral reserves ranging from Manganese, found in Balaghat and Chhindwara districts, to Bauxite which is found in Jabalpur, Mandla, Shahdol, Satna and Rewa. Iron ore deposits are also found in state in Balaghat, Jabalpur and Mandla districts. Madhya Pradesh also has a rich reserve of coal in the northeastern and Satpura regions. The state has the distinction of being the only diamonds producing state in India.

Madhya Pradesh has over 30% area covered under forest mainly concentrated in eastern districts of Balaghat, Mandla, Shahdol and Sidhi

CHAPTER 3: POWER SECTOR IN MADHYA PRADESH

Power sector can be divided into three verticals having Generation, Transmission and Distribution business. As per Madhya Pradesh Vidyut Sudhar Adhiniyam, 2000 the erstwhile integrated Madhya Pradesh State Electricity Board (MPSEB) was restructured into:

- ✓ Madhya Pradesh Power Generating Co. Ltd., Jabalpur (MPPGCL) vested with the function of Power Generation within the State
- ✓ Madhya Pradesh Power Transmission Co. Ltd., Jabalpur (MPPTCL): vested with the function of Power Transmission within the State
- ✓ Madhya Pradesh Poorva Kshetra Vidyut Vitaran Company Ltd. Jabalpur (MPPKVVCL or East Discom): To undertake distribution of electricity in Eastern part of MP
- ✓ Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Ltd. Indore (MPPKVVCL or West Discom): To undertake distribution of electricity in Western part of MP
- ✓ Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Ltd. Bhopal (MPMKVVCL or Central Discom): To undertake distribution of electricity in Central part of MP

These companies entered into an operation management agreement with the MPSEB and worked as agents of the MPSEB from July 2002 to May 2005. These companies started independent functioning from June 2005. A sixth company, namely the MP Power Trading Company Ltd. (TRADECO), was also incorporated for purchase of electricity in bulk from generating

companies / traders, from within and outside the State and supply electricity in bulk to the electricity distribution Companies in the State of M.P. Further the name of MP Tradeco was changed to M. P. Power Management Company Limited (MPPMCL).

Further Government of Madhya Pradesh transferred all the shares of the power companies to MPPMCL and subsequently all power companies are subsidiaries of MPPMCL, Jabalpur.

Electricity Regulatory Commission in the state of Madhya Pradesh was established in the year 1998. MPPMCL is regularly filing Annual Tariff Revision Petitions. Since the year 2004, Regulator has been issuing retail tariff orders regularly every year.

GENERATION

In the FY 03, the contracted generation capacity of the state was merely 4,673 MW. In past 12 years, capacity addition to the tune of 10,727 MW has been achieved and as on August, 2015, the available generation capacity for the state has grown up to 15,400 MW and the state has become power surplus and self-reliant.

Table 1: Available generation capacity as on August, 2015

Sources	Capacity Available (MW)
MP Genco Thermal and Hydro	5,237 MW
NHDC & Other hydel	2427 MW
Central Sector share	3230 MW
DVC Thermal	500 MW
IPPs Thermal	2986 MW
Renewable sources	1020 MW
Total	15,400 MW

MPPGCL is the state owned power generating company supplying power to the state Discoms. It has an installed capacity of 5237 MW containing 917.2 MW from hydro based power plants and remaining from thermal.

Out of the above plants, MPPGCL has planned to decommission inefficient or old plant (Amarkantak extension TPP) of capacity 2x120 MW and to be replaced with a super critical unit.

TRANSMISSION

MPPTCL is the state owned power transmission company undertaking intra state power transmission business.

MPPTCL started its operation with 141 substations with a capacity of 16,680 MVA in

the year 2002 which has increased to 292 substations with a capacity of 45,457 MVA by March 2015 (an increase 280% in capacity).

With 2.82% transmission losses and 99.35% of system availability, MPPTCL is one of the best performing transmission utility in the country.

Madhya Pradesh is the pioneer State to implement the SCADA System at EHV substations and Automatic Demand Management System (ADMS) for automated demand management of Discoms through Transco.

Following table gives the gist of historical growth in State's transmission infrastructure:

Table 2: Historical growth in transmission infrastructure

Particulars	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
Transformation Capacity (MVA)	24855	26015	29078	32040	34232	35564	37750	41163	45457
No. of EHV Substations (No.)	199	205	217	228	241	248	256	275	292
No. of EHV Transformers (No.)	470	491	521	566	592	607	624	669	711
Length of EHV Lines (Ckt Km)	20949	21667	22961	24622	26469	27119	27825	29010	30675
Reduction in Transmission losses	5.00%	4.09%	4.09%	4.19%	3.74%	3.51%	3.30%	3.00%	2.82%
Transmission system availability	98.96%	99.02%	98.16%	98.82%	99.13%	99.23%	99.44%	99.43%	99.35%

DISTRIBUTION

There are three distribution companies serving consumers in the state. Madhya Pradesh Poorva Kshetra Vidyut Vitaran Company Ltd (MPPuKVVCL or East Discom) having an area of 135,162 sq.km and serving 42 lakh consumers, Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Ltd (MPPaKVVCL or West Discom) serves 43 lakh consumers and Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Ltd (MPMKVVCL or Central Discom) serves 31 lakh consumers.

Focus of the Discoms in the State is to improve the quality of power supply and ensure better customer services. AT&C losses at Discom boundary are still high at 23.07%, and to achieve desired reduction trajectory, the Discoms are carrying out the following activities:

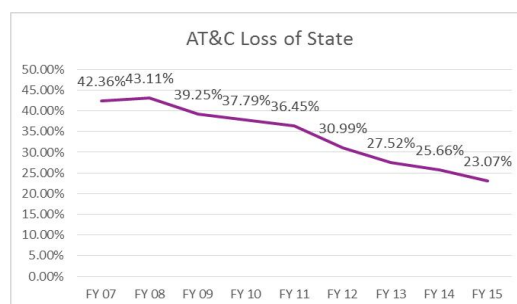
- Remote/automated metering.
- Spot billing, credit card payment, internet, ATP machines.
- Conversion of LT system into HVDS / feeder separation with cabling on LT side for domestic feeders.

- Appointment of franchisee in high loss areas – Sagar & Ujjain.
- 112 special courts for speedy trial of theft cases.
- Special armed forces for reducing theft.

Regarding metering, it is to mention that meters have been installed on almost all 33 KV & 11 KV feeders.

Further there has been substantial growth in distribution infrastructure in the state.

Figure 1: AT&C losses reduction in past years



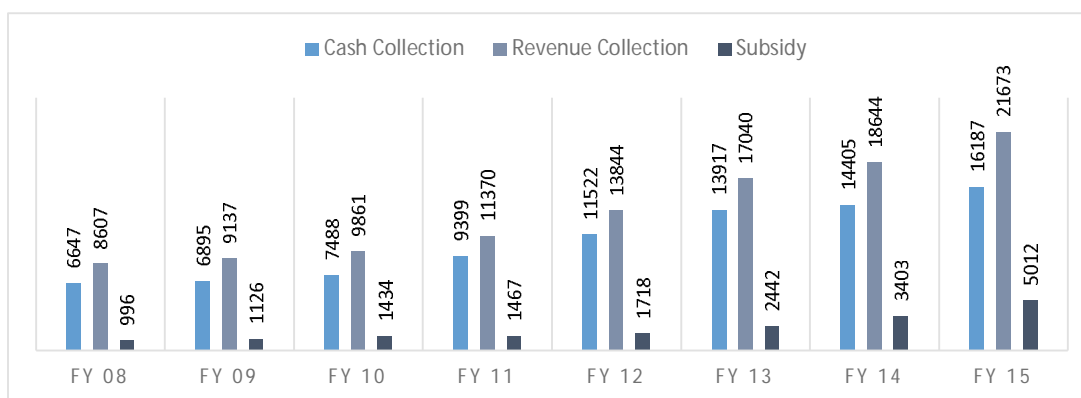
A summary of the same is presented in the following table:

Table 3: Historical growth in distribution infrastructure

Particulars	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
33 KV Lines	32947	33913	35828	37234	38867	39730	41528	43910	45914
11 KV Lines	167476	171691	177074	187577	202065	220370	262223	293278	313068
LT Lines	338148	340567	340645	343386	346006	352471	363838	369217	375263
No. of 33 KV Substations	2141	2256	2468	2611	2685	2745	2877	3053	3150
No. of Power Transformers	3144	3441	3857	4040	4240	4409	4814	5360	5631
DTRs	189803	200720	214015	238109	267254	308354	365769	421113	465370

Distribution Licensees' revenue and cash collection have also increased from Rs. 6647 crore & Rs. 8607 crore in FY 08 to Rs. 16,187 crore & Rs. 21,673 crore in FY 15 respectively.

Figure 2: Revenue & cash collection in past years (Rs. Crore)



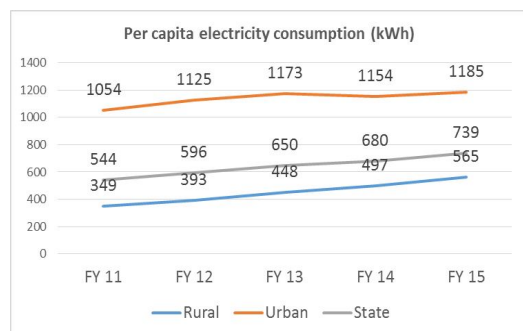
PER-CAPITA CONSUMPTION

ELECTRICITY

The population of Madhya Pradesh has grown from 6.03 Crores in 2001 to 7.26 Crores in 2011 at a decadal growth of more than 20%. This growth rate has been considered for estimating the population beyond 2011. Based on the annual energy requirement from FY 11 to FY 15 including

demand from open access consumers, the per-capita consumption of electricity in the period has been as shown below:

Figure 3: Per-Capita Consumption of Electricity (kWh per person) in recent years



- *Per capita electricity consumption of Madhya Pradesh based on energy demand for the state in FY 2014-15 was registered at 739 kWh (India 1010 kWh)*
- *The reason for lower per capita electricity consumption is large number of BPL consumers and tribal regions.*
- *Other major reason for lower per capita consumption is lower industrial (25.05%) & commercial (7.07%) consumption and higher agricultural consumption (38.74%)*

STATUS OF ELECTRIFICATION

District-wise electrification in urban and rural areas¹ is detailed in Table 50 in Annexure-2.

The summary of electrified and un-electrified households as per 2001 and 2011 census and projections for FY 2015 based on CAGR for past 10 years is tabulated below:

Table 4: Projection of households based on Census 2001 and 2011

	Particulars	Total	Rural	Urban
2001	East Zone	46,60,933	37,41,654	9,19,280
	Central Zone	33,79,729	23,74,508	10,05,221
	West Zone	28,78,991	20,08,634	8,70,357
	State	1,09,19,653	81,24,795	27,94,858

	Particulars	Total	Rural	Urban
2011	East Zone	63,86,870	51,22,103	12,64,767
	Central Zone	46,33,568	32,50,561	13,83,007
	West Zone	39,47,159	27,49,701	11,97,458
	State	1,49,67,597	1,11,22,365	38,45,232
2014-15	East Zone	72,44,604	58,07,674	14,36,930
	Central Zone	52,56,899	36,85,634	15,71,265
	West Zone	45,00,072	31,17,736	13,82,336
	State	1,70,01,575	1,26,11,044	43,90,531

3.1 From above it is inferred that:

- *East zone had the highest number of households at 43% in 2011*
- *In 2011, 74% of the households were in rural areas and 26% in urban areas of the State.*
- *In 2011, Central Zone had the highest share of urban households at 30% and East Zone had the lowest at 20%*
- *In 2011, only Bhopal and Indore districts had electrification above 90%*
- *6 districts (Indore, Rewa, Jabalpur, Sagar, Bhopal and Satna) contributed 21% of the total households having electrification at 76.61%.*
- *Out of 50 districts in 2011 census, 14 districts (Singrauli, Panna, Bhind, Morena, Dindori, Shivpuri, Sidhi, Tikamgarh, Shahdol, Rewa, Umaria, Chhatarpur, Anuppur, and Ashoknagar) had electrification below 50%.*
- *Overall number of households has grown at a decadal CAGR of 3.2% with urban areas showing higher decadal growth rate of 3.24% as compared to 3.19% in rural areas.*

The above projected figures, derived by extrapolating Census 2011 data, do not match with the records of the Discoms for FY

¹ As per the information available in <http://censusindia.gov.in/>

15 which shows a different position. The following table compares the projected number of electrified and un-electrified households at end of FY 15 based on Census 2011 and as per Discoms' records (all the three Discoms).

Table 5: Projection of Census 2011 vs. State's Consumer

FY 15				
	East Zone	Central Zone	West Zone	State
Total No. of Households projected based on Census, 2011				
Total	72,44,604	52,56,899	45,00,072	1,70,01,575
Rural	58,07,674	36,85,634	31,17,736	1,26,11,044
Urban	14,36,930	15,71,265	13,82,336	43,90,531
Electrified Households				
Total	44,52,402	34,15,736	38,47,233	1,17,15,371
Rural	31,37,171	18,63,745	24,68,146	74,69,062
Urban	13,15,231	15,51,991	13,79,087	42,46,309
Un-electrified Households				
Total	27,92,202	18,41,163	6,52,839	52,86,204
Rural	26,70,503	18,21,889	6,49,590	51,41,982
Urban	1,21,699	19,274	3,249	1,44,222
Number of connected domestic consumers (Discom data)				
Total	32,22,705	23,69,861	29,87,678	85,80,244
Rural	21,08,680	11,68,380	17,23,516	50,00,576
Urban	11,14,025	12,01,481	12,64,162	35,79,668
Difference in electrified households (As per Discom data & Census projections)				
Total	12,29,697	10,45,875	8,59,555	31,35,127
Rural	10,28,491	6,95,365	7,44,630	24,68,486
Urban	2,01,206	3,50,510	1,14,925	6,66,641

Against the projections of 1,17,15,371 electrified households in FY 15, there are 85,80,244 electrified consumers on record of Discoms i.e. 50,00,576 consumers in rural areas and 35,79,668 in urban areas.

This anomaly / discrepancy in figures can be explained as follows:

- Households, which are supplied from a common electricity connection / having submeters within a given premises, are regarded as one household by the utilities but counted separately in the census.

- Else, there may be electrified households that are not drawing power through regular/legal connections.
- Discoms also provide bulk residential connection which further has many households who are not direct consumers of Discoms.

Census survey is based on the verification of the households which are using electricity as a source of lighting, whereas electrified households as per records of licensees is actual number of registered consumers, which does not include the consumers with unauthorised connection or common connection. Such consumers with unauthorised connections are also using electricity which only needs to be regularised and will not impact on increase the demand significantly.

These households are thus considered to be electrified for making further projections and are added to total registered number of domestic consumers of discoms. Total number of un-electrified households have been derived by subtracting the electrified households from total projected households as per census data and is shown in the table below:

Table 6: Un-Electrified households at the end of FY 15

FY 15				
Discom	East Zone	Central Zone	West Zone	State
Un-electrified Households				
Total	27,92,202	18,41,163	6,52,839	52,86,204
Rural	26,70,503	18,21,889	6,49,590	51,41,982
Urban	1,21,699	19,274	3,249	1,44,222

CHAPTER 4: DEMAND AND SUPPLY SCENARIO

PRESENT POWER SUPPLY POSITION

The actual energy and demand scenario during the past 5 years is shown below:

Figure 4: Energy Requirement vs. Supply² (in MU) (excluding open access)

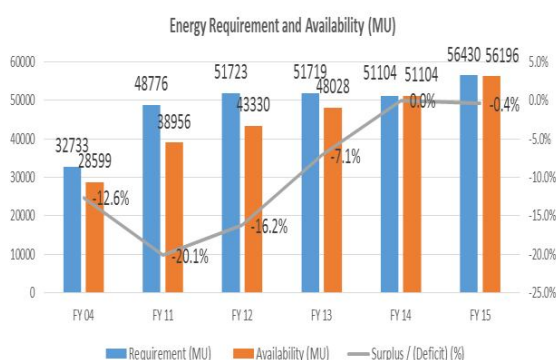
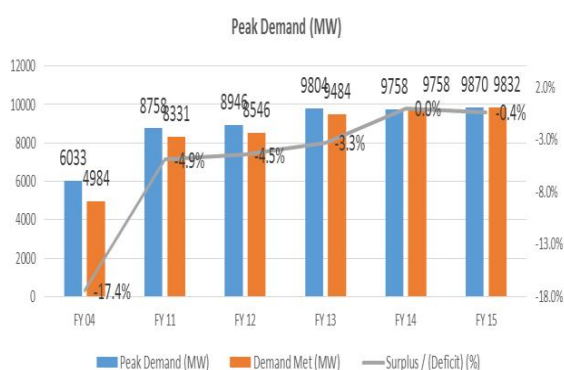


Figure 5: Peak Demand vs. Peak Met (in MW)



- The State has progressively reduced the deficit and has become surplus from FY 14 onwards.
- In FY 15 there was marginal deficit of 0.4% because of national grid failure.

- In current year i.e. FY 16 peak demand has already reached 10,204 MW and has been fully met by State.

In the state of Madhya Pradesh, agricultural consumption is around 39% of the total consumption. As a load flattening measure supply of 10 hours to agricultural consumers is being given in two groups; and the supply is provided only to one group at a time. Therefore, entire agricultural load does not reflect on the system at once. Accordingly, it is assessed that the load factor in the state would remain higher in the forthcoming years and, therefore, Peak Load would remain lower.

Government of Madhya Pradesh had taken up an ambitious feeder separation project by covering 6,760 numbers of feeders for providing 24 hours supply to the rural households and agricultural pumps separately. Till October, 2015 around 82% of the project is already completed.

Table 7: Status of feeder separation program

Particulars	East	Central	West	State
No. of feeders to be separated	1891	2016	2853	6760
Feeders separated till Oct-15	1546	1180	2816	5542
% Achievement	82%	59%	99%	82%

Based on the long term PPAs, the state is now surplus in power and since June, 2013, 24 hour supply to all non-agriculture consumers and 10 hours

² As per the data available maintained by the discoms

quality supply to agriculture pumps is being provided under Atal Jyoti Abhiyan.

DEMAND PROJECTIONS

The energy requirement of Madhya Pradesh during FY 15 was 56,430 MU as per State data. With 24 x 7 supply to be maintained across the state and new connections to be provided, the demand is likely to increase. The demand can be classified in three broad categories.

- Demand on account of 24x7 power supply to already electrified and newly built domestic households.
- Demand from electrification of un-electrified domestic households.
- Demand on account of 24x7 power supply to other than domestic category.

DEMAND ESTIMATION FOR DOMESTIC CONSUMERS AND HOUSEHOLD ELECTRIFICATION

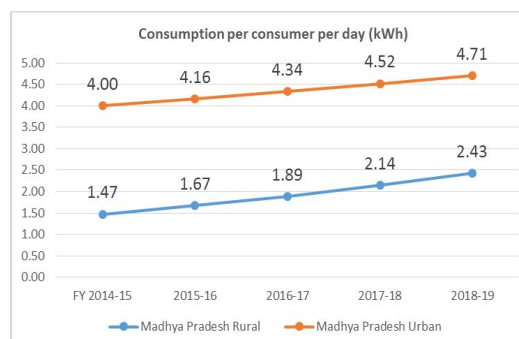
The actual daily household consumption of rural consumers has increased to 1.47 kWh in FY 15 at CAGR of 13.3% during the last 4 years. On the other hand, the daily household consumption of urban consumers has increased to 4.00 kWh in FY 15 at CAGR of 4.2% during the last 4 years.

The broad approach for projection is highlighted below:

- The daily household consumption has been computed separately for rural and urban households for FY 15 as well as for each discom and escalated based on the historical growth rate seen in last 4 years to arrive at the daily household consumption up to FY 19.
- The annual sales in domestic category has been arrived on consideration that the projected households in both rural and urban categories would be consuming

electricity at their respective projected daily household consumptions.

Figure 6: Projected household consumption



The average daily household consumption of existing electrified rural and urban households in FY 15 has been arrived by dividing the actual sales in rural and urban areas for the whole state by projected number of electrified rural and urban households in FY 15 respectively.

However, it may also be kept in view that the geographical features of the state (i.e. the location, accessibility, weather) along with current tariff levels play a significant role in determining the current and future demands.

The number of electrified households is expected to grow at the decadal CAGR of 3.19% in rural areas and at the decadal CAGR of 3.24% in urban areas.

Also, to electrify the remaining 51,41,982 households in rural areas, phasing of electrification of 10% households in FY 16, 20% households in FY 17, 30% in FY 18 and remaining 40% in FY 19 has been considered.

For electrification of balance 1,44,222 urban households, the connections will be released once the strengthening works in the proposed under urban strengthening schemes like IPDS are executed and accordingly phasing of 10% in FY 16, 20% in

FY 17, 30% in FY 18 and remaining 40% has been considered in FY 19.

Accordingly, the annual consumption of the domestic households is tabulated below for

the State. Discom wise annual consumption of the domestic households is shown from Table 52 onwards.

Table 8: Projected Sales from Existing and Newly Electrified Households (Madhya Pradesh)

S.N.	Particulars	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
A	Rural - Electrified Households (Existing + Projected Growth)					
	Electrified Households Rural (in Nos.)	74,69,062	77,07,340	79,53,220	82,06,944	84,68,763
	Actual Metered Sales (in MU)	4,018				
	Actual Daily Household Consumption	1.47				
	Projected Daily Household Consumption		1.67	1.89	2.14	2.43
	Projected Annual Consumption		4,624	5,406	6,320	7,389
B	Rural - Electrification of Un-Electrified Households					
	Targeted Annual Addition Rural (in Nos.)		5,14,198	10,28,396	15,42,595	20,56,793
	Cumulative Annual Addition (In Nos.)		5,14,198	15,42,595	30,85,189	51,41,982
	Projected Annual Consumption		155	703	1,796	3,622
C=A+B	Total Projected Rural Consumption (MU)		4,779	6,109	8,115	11,010
D	Urban - Electrified Households (Existing + Projected Growth)					
	Electrified Households Urban (in Nos.)	42,46,309	43,83,973	45,26,100	46,72,835	48,24,327
	Actual Metered Sales (in MU)	6,196				
	Actual Daily Household Consumption	4.00				
	Projected Daily Household Consumption		4.16	4.34	4.52	4.71
	Projected Annual Consumption		6,559	7,054	7,587	8,160
	Urban - Electrification of Un-Electrified Households					
	Targeted Annual Addition urban (in Nos.)		14,422	28,844	43,267	57,689
	Cumulative Annual Addition (In Nos.)		14,422	43,267	86,533	1,44,222
	Projected Annual Consumption		10	43	100	184
E	Total Projected Urban Consumption (In MU)		6570	7097	7687	8344
F=C+E	Total Projected Domestic Urban Consumption (In MU)		11,349	13,206	15,802	19,354

DETERMINATION OF CONSUMPTION OF OTHER CONSUMERS

For projection of sales for FY 16 to FY 19, the appropriate CAGR based on historical trends

has been considered for all the other categories.

Based on same, projected category-wise sales is as shown in the table below:

Table 9: Projected Category-wise Sales (In MU)

Categories	FY 16	FY 17	FY 18	FY 19
Domestic	11,349	13,206	15,802	19,354
Non Domestic	2,471	2,752	3,049	3,363
Public Lighting	431	466	497	526
Public Water works LT	719	800	864	926
Public Water works HT	513	544	573	602
Irrigation LT	18,462	20,796	22,626	24,459
Lift Irrigation HT	55	59	63	66
Industrial LT	1,125	1,219	1,320	1,424
Industrial HT	8,411	9,213	10,037	10,916
Railway Traction	1,994	2,106	2,225	2,341
Non - industrial HT	1,029	1,092	1,161	1,231
Total Sales	46,558	52,252	58,217	65,208

- As seen from above, the consumption share of industries and railway (combined) would be around 22.51% whereas the share of irrigation sales will be around 37.61% in FY 19.

ENERGY AND DEMAND REQUIREMENT

The trajectory for AT&C loss reduction as per state targets has been taken into account for preparing this roadmap document.

Considering the collection efficiency of 100% in Madhya Pradesh, the AT&C Loss trajectory as considered for estimating the energy and demand requirement is shown below:

Table 10: AT&C loss targets for Discoms

Discom	FY 16	FY 17	FY 18	FY 19
West	22.38%	20.40%	18.41%	16.27%
Central	25.41%	23.43%	21.44%	19.30%
East	21.70%	19.72%	17.73%	15.59%
Madhya Pradesh	23.15%	21.15%	19.15%	17.00%

Based on the loss reduction trajectory for each Discoms, the energy and demand

requirement for future years have been derived.

The load factor which at present is around 66.15% is expected to improve and will reach 73% by end of FY 19. Maximum demand requirement at state periphery is projected to increase from 9598 MW in FY 15 to 12,643 MW in FY 19.

As per projections made in 18th EPS of CEA, the projected energy demand and maximum demand for the state of Madhya Pradesh was 89,152 MU and 15,803 MW in FY 19 as against the now calculated energy requirement of 80,847 MU and maximum demand of 12,643 MW in FY 19.

To analyze the timing of the peak in the state the load curves for FY 14 and FY 15 are shown in the following figures:

Figure 7: Load curve during FY 14³

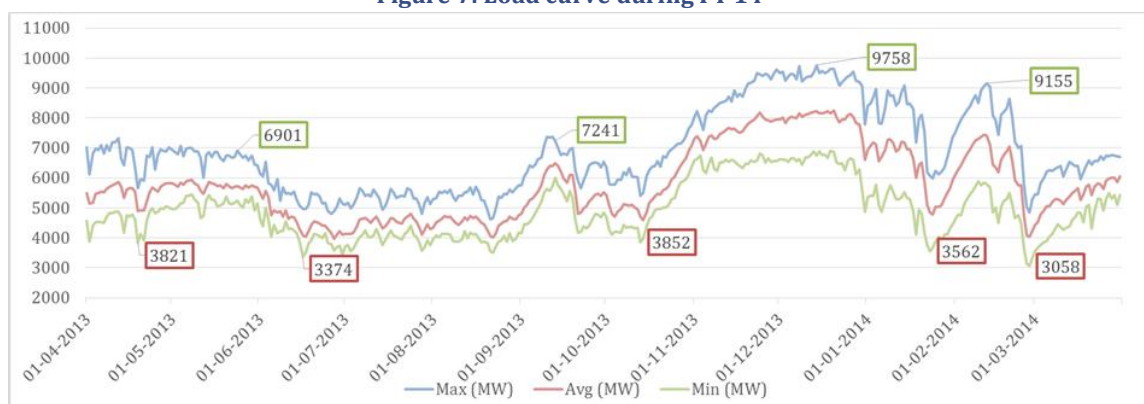


Figure 8: Load curve during FY 15



It is evident that the maximum demand is observed in the second week of December in both the years which is mainly due to agriculture load during rabi season. The peak was witnessed in the morning hours during the period of 8:00 am to 10:00 am. However, the gap between the maximum demand and minimum demand during any day has increased in FY 15 to 4412 MW compared to 3582 MW in FY 14. As such rabi

season demand is observed consistently every year, State has made appropriate banking arrangements for meeting such demand wherein it banks its surplus power in summer season to deficit states and draws it in peak period.

Considering the above, the overall energy and demand requirement of the state is summarized in the following table.

³ Ex-bus demand

Table 11: Energy Requirement (In MU) and Peak Demand (in MW)

Source	Energy Scenario			
	FY 16	FY 17	FY 18	FY 19
Energy Requirement within State				
Sales (MU)	46558	52252	58217	65208
Distribution loss	23.15%	21.15%	19.15%	17.00%
AT&C losses	23.15%	21.15%	19.15%	17.00%
Collection Efficiency	100%	100%	100%	100%
Transmission losses	2.82%	2.82%	2.82%	2.82%
Total Energy Requirement at state periphery (MU)	62,342	68,193	74,098	80,847
Load factor	69.00%	71.00%	72.00%	73.00%
Peak Demand (MW)	10,314	10,964	11,748	12,643

Assessment of the adequacy of generation, transmission and distribution infrastructure for meeting the projected annual energy requirement of 80,847 MU and maximum demand of 12,643 MW has been made and is covered in the following chapters.

CHAPTER 5: GENERATION PLAN

CUMULATIVE GENERATION AVAILABILITY

The total available capacity in Madhya Pradesh including firm share of CGS as on 31st March 2015 (allocated capacity in State, Private, joint and CGS) is 15,190 MW. Station wise details are at Table 55.

Out of the total available capacity in FY 15 share of state generating company (MPPGCL) is around 34% and private companies is around 18%. In addition to the above capacity, unallocated power from CGS at the disposal of Central Government, power from DVC, IPPs including power from Sasan UMPP, renewable energy sources, etc. is available for the Madhya Pradesh.

Table 12: Availability Mix from Firm Sources

Sources	Available Capacity (MW)
MP Genco Thermal	4320
MP Genco Hydel	917
JV Hydel & Other Hydel	2427
Private Generating Stations	2776

Table 13: Summary of Additional Firm Availability from Various Sources

Sr. No.	Source	Type	Capacity (MW)	Entitlement		Availability
				%	MW	
	Availability Within State					
A	New Stations-Own & Private					
	MPPGCL - Shri Singaji Phase-2, Unit-1	Coal	660	90%	594	FY 19
	MPPGCL - Shri Singaji Phase-2, Unit-2	Coal	660	90%	594	FY 19
Subtotal	New Stations-Own		1320		1188	
B	Renewable Energy Sources					
	Solar Plants	Solar	1,800	100%	1800	FY 16 & FY 17
	Wind Plants	Wind	2,800	100%	2800	FY 16 & FY 17
	Bio Mass/Bio gas Plants	Biomass	117	100%	117	FY 16 & FY 17
	Other Small Hydro	Other RE	150	100%	150	FY 16 & FY 17
Subtotal	Renewable Energy Sources		4867		4867	
C	CGS – New					

Sources	Available Capacity (MW)
Central Generating Stations	3731
Renewable Energy Sources	1020
Total	15,190

Maximum ex-bus demand and energy requirement in the state was 9,870 MW and 56,397 MU in FY 15 respectively.

The maximum demand is expected to increase to 12,643 MW by FY 19 and the energy requirement is projected to rise to 80,847 MU in FY 19, taking into account additional energy requirement for providing 24x7 power supply to the state over the normal load growth.

PLANNED CAPACITY ADDITION

A number of generating stations (hydro, coal based, renewable etc.) are planned to be commissioned up to FY 19. The additional capacity available from various sources (along with the expected year of commissioning) is summarized below:

Sr. No.	Source	Type	Capacity (MW)	Entitlement		Availability
				%	MW	
	NTPC Vindhyanchal STPS, Stage - 5, Unit-1	Coal	500	26%	128	FY 17
	NTPC Mouda STPS, Stage-2, Unit-1&2	Coal	1320	16%	206	FY 17
	NTPC Lara STPS, Rajgarh (Unit 1 to 6)	Coal	4800	7%	319	FY 18
	NTPC Gadawara STPS, Unit-1	Coal	800	50%	400	FY 18
	NTPC Gadawara STPS, Unit-2	Coal	800	50%	400	FY 18
	NTPC North Karanpura STPS, Unit-1	Coal	660	10%	66	FY 19
Subtotal	CGS – New		8880		1519	
D	IPPs					
	MB Power STPS, Unit-1	Coal	600	35%	210	May-15 (Commissioned)
	MB Power STPS, Unit-2	Coal	600	35%	210	FY 16
	Jhabua Power STPS, Unit-1	Coal	600	35%	210	FY 16
Sub total	IPPs		1800		630	
Total					8,204	

* Share allocation of some of the CGS is tentative as firm allocation is yet to be done by MoP.

The table below summarizes the availability of power from various sources including existing and upcoming capacity availability till FY 19:

Table 14: Projected firm share allocations from various sources (MW)

Source	Capacity Available (MW)				
	FY 15	FY 16	FY 17	FY 18	FY 19
MP Genco Thermal	4320	4320	4320	4320	5508
MP Genco Hydel	917	917	917	917	917
JV Hydel & Other Hydel	2427	2427	2427	2427	2427
Private Generating Stations (except UMPP)	1291	1921	1921	1921	1921
Sasan UMPP	1485	1485	1485	1485	1485
Central Generating Stations	3731	3731	4065	5184	5250
Solar	305	1055	2105	2105	2105
Wind	685	2485	3485	3485	3485
Other renewable	30	227	297	297	297
Total	15190	18567	21021	22140	23394

As seen from above, there is a substantial capacity addition from FY 16 to FY 19 based on the latest expected dates of commercial operation as available.

The projected energy availability from the above mentioned sources and the adequacy to meet the requirement for the State is summarized in following table:

Table 15: Projected Energy Availability from Firm Share/Long Term Tie-Ups

Source	Adequacy of Energy Availability			
	FY 16	FY 17	FY 18	FY 19
Total Energy Requirement	62,342	68,193	74,098	80,847
Energy Availability from Long Term Firm Tie-ups	77,328	87,473	90,725	98,587
<i>Energy Availability from Long Term Firm Tie-ups (In %age)</i>	124.04%	128.27%	122.44%	121.94%
<i>Targeted Energy Availability from Long Term Firm Tie-ups (In %age)</i>	95.00%	95.00%	95.00%	95.00%
Targetted Energy Availability from Long Term Firm Tie-ups	59,225	64,783	70,393	76,804
Adequacy of Power Supply	Adequate	Adequate	Adequate	Adequate
Surplus Energy (MU)	14,986	19,281	16,627	17,741

For determining the adequacy of energy availability, it is considered that the state should be able to meet 95% of its projected energy requirement through firm allocations/tie-ups only and for the balance 5%, the state has to effectively plan (through comprehensive power procurement planning on short term and medium term basis) and look for procurement of power either through competitive bidding or power exchange or through other sources on short term/medium term basis. However from the above table it is seen that the availability from tied-up firm share will remain above 120% of the energy requirement for entire period till FY 19.

RENOVATION AND MODERNIZATION

State generating company has planned to spend around Rs. 330 Crores on R&M of old plants.

MPPGCL has planned to decommission inefficient or old plant (Amarkantak extension TPP) of capacity 2x120 MW and to be replaced with a super critical unit.

FUND REQUIREMENT

The fund requirement for state projects is summarized below:

Table 16: Fund Requirement for State Generation Projects (Rs. Crores)

S No.	Plant name	Capacity (MW)	Type	Scheme	Estimate	Upto FY 15	Phasing (Rs Crores)			
							FY 16	FY 17	FY 18	FY 19
A	COMPLETED PROJECTS									
1	Shree Singaji (Malwa) T.P.P.	2x600	Thermal	New Plant	7820	7280.02	470.00	9.17	0.00	0.00
2	Sarni S. T.P.S. Extn. Unit 10 & 11	2x250	Thermal	New Plant	3514	3121.67	389.46	0.01	0.00	0.00
B	ONGOING PROJECTS									
1	Shri Singaji Thermal Power Project (Phase - II)	2x660	Thermal	New Plant	6500	506.78	830	1300	1500	1300
C	NEW PROJECTS									
1	Amarkantak T.P.S. Extn.	1x250	Thermal	New Plant	1610.7	0.00	0.01	0.25	200.00	300.00
2	Sarni T.P.S. Extn.	1x660	Thermal	New Plant	4563.6	0.00	0.00	0.25	300	1000

S No.	Plant name	Capacity (MW)	Type	Scheme	Estimate	Upto FY 15	Phasing (Rs Crores)			
							FY 16	FY 17	FY 18	FY 19
3	Kanhan HEP (Kamthikhurd, Chhindwara)	2x45	Hydel	New Plant		0.00			54.00	144.00
4	S.G. T.P.S. Extn.	1x500 / 660	Thermal	New Plant		0.00		0.10		
D	OTHER SCHEMES									
1	R&M works of old Thermal Power Stations			RM&U		0.00	139.84	192.14	0.00	0.00
2	Development of Coal Block for Singhaji PH-II & Satpura TPS Extn Unit 6 (1x660 MW)			For New Plants		0.00	240.00	200.00	0.00	0.00
	TOTAL (MP GENCO PROJECTS) (A+B+C+D)				24008	10908.5	2069.3	1701.9	2054	2744
	Loan					8502.23	1195.1	1300.1	1400	2094
	Equity					2406.24	874.22	401.82	654.00	650.00

ACTION POINTS FOR THE STATE

- 1) There is considerable surplus power capacity (over 20%) available with the state. The state needs to optimize its power purchase and should look forward for selling the surplus power to prospective deficit states so as to earn revenue for the state.
- 2) State must look for options to exit from costlier long term power sources (both private as well as CGS).
- 3) State must ensure that the new CGS being tied up for power should also have lower tariff.
- 4) Considering legal bindings, State is exploring ways to exit from long term PPA for avoiding purchase of costlier power. State has also sought Legal advice for the same.
- 5) State has planned to decommission 2x120 MW units of Amarkantak extension TPS and to be replaced with a super critical unit. State shall also plan for decommissioning other inefficient or old plants as well.

GOVERNMENT OF INDIA INTERVENTION

The issues highlighted by the state for intervention of Government of India are detailed as follows:

- 1) Cost of generation at Sanjay Gandhi Thermal Power Station Birsinghpur is higher on account of supply of costly higher grade coal above 5800 Kcal/Kg (A&B Grade) by SECL to the tune of around 65% of total coal supplies in past FY 14 and FY 15.

Efforts have been made and with the intervention of Hon'ble Minister (I/C) of Coal and Power, assurance of CIL has been obtained in a meeting dated 28.10.2015 that supply of higher grade coal to SGTPS Birsinghpur will be limited within 20-25% without affecting overall materialization.

In the past two years, MPPGCL had to bear additional financial burden of around Rs. 650 Crores per annum on account of supply of higher grade coal above 20% of benchmarked quantity.

In the current financial year, M/s CIL have restricted supply of higher grade coal to around 34% of total supply by the end of Oct, 2015. It is anticipated that the supply of higher grade coal shall be further reduced.

- 2) Shree Singaji Thermal Power Project at Khandwa has been allocated coal linkage from the far away mines of SECL located at a distance of around 1000 Kms,

Efforts are being made for rationalization of coal sources to SSTPP Khandwa from nearby coal mines of WCL, which are around 400 KMs from the TPS instead of faraway mines of SECL. MoC and MoP are being constantly pursued in this regard.

CIL has allowed to swap part linkage of 18.513 LMT for 2x250 MW extension Units of STPS Sarni from WCL sources with a matching quantity of coal linkage of SSTPP, Khandwa from SECL sources.

However the issue involved is to rationalize entire ACQ of SSTPP, from WCL sources instead of SECL sources. The part swapping of ACQ is only a time gap arrangement. Centre's assistance is therefore requested for full rationalization of sources for SSTPP from WCL mines.

- 3) Annual Contracted Quantity (ACQ) of 49.939 LMT coal for SSTPP, Khandwa is grossly insufficient as compared to actual requirement. However, Ministry of Coal refused to consider further enhancement of the ACQ. In this regard, it is to submit that M/s SECL is providing only 70% of ACQ i.e. 34.96 LMT for SSTPP. As the ash content of coal is more than 34%, the coal is required to be routed through the washery circuit as per the guidelines of MoEF. The improvement in quality on account of coal beneficiation is likely to reduce cost of generation from SSTPP, Khandwa beside substantial savings on account of reduced ash disposal, less wear and tear, lower maintenance cost and fewer spare part replacements.

As a result of washing, the quantity of coal gets reduced by approx. 20%. As such, the net quantity reaching to the power

station is 80% of 70% of ACQ i.e. about 56% of ACQ only, which is 27.96 LMT.

As this plant has been dedicated to the nation by Hon'ble Prime Minister, CIL should look for special dispensation for this plant.

In view of above, it is requested that ACQ of SSTPP, Khandwa should be enhanced from 49.939 LMT to at least 62.42 LMT, so that after washing, a net quantity of about 34.96 LMT reaches to plant.

- 4) MPPGCL has appointed CIMFR a GOI entity as third party for sampling of coal at SECL and WCL sidings. On the basis of coal sampling done by CIMFR, MPPGCL has claimed Rs. 47.43 Crores from SECL & WCL for grade slippage & excess moisture. Ministry of Coal is requested to settle the issue at the earliest.
- 5) Central government has allocated a coal block for Singhaji II and Satpura TPS extension unit (1x660 MW). It is requested to that all the relevant clearances for coal block development be expedited so that the mine development work match with progress of Singhaji Stage II units.
- 6) Power from Mouda, Kawas, and Gandhar of NTPS is very costly. State is willing to surrender its costly power these stations, however the current policies does not allow the state to do so unless some other State is willing to buy it. It is requested to the Central government to come up with a relevant policy / instrument through which the State can surrender the power from costlier Central Generating Stations to reduce overall cost.
- 7) Like Madhya Pradesh many other states are also expected to have surplus power, it is requested that Central Government formulate an instrument through which surplus power can be sold to the deficit

States.

- 8) State has concerns over the decision taken by Central Government as per which, cheaper power of NTPC old plants will be bundled with solar power, due to which average rate of bundled power will become very high. It is requested that such decision be reviewed and applicable only to willing States. The states not opting bundled power should get power at earlier cheaper rate.
- 9) It is requested to the Centre to direct the Central Generating Companies should

execute all their projects in time which otherwise results in unnecessary IDC burden on State.

- 10) Tentative capacity addition till FY 17 from renewable energy sources is around 4800 MW. Considering the surplus situation in the State the Central Government should provide subsidy support to procure such renewable capacity.

The Central Government is requested not to insist on meeting the past RPO obligations.

CHAPTER 6: TRANSMISSION PLAN

The total energy projected for Madhya Pradesh in FY 19 is 80,847 MU and the maximum demand comes out to be 12,643 MW. This chapter makes an assessment of the transmission network in FY 19 conditions to ascertain its adequacy and reliability to meet the state's power demand across its load centers, import power from central generating stations into the state and export surplus power generated from power plants in the state.

EXISTING INTER-STATE TRANSMISSION SYSTEM (ISTS)

The interstate transmission network in Madhya Pradesh, is connected to the neighboring states of Maharashtra, Gujarat, Rajasthan and Chhattisgarh, all of which form part of the Western regional grid.

To ensure reliable evacuation of power from central sector generation projects to Madhya Pradesh and to meet the demand of major load centers within Madhya Pradesh, PGCIL has established transformation capacity of 22,000 MVA at 765/400 kV, and 5,985 MVA at 400/220 kV level.

Table 17: Existing Transformation capacity in ISTS

Name of Substation	District	Capacity (MVA)
Existing 765/400kV		
Bina 765kV	Sagar	2000
Bhopal 765kV	Bhopal	3000
Satna 765kV	Satna	2000
Seoni 765kV	Seoni	3000
Indore 765kV	Indore	3000
Jabalpur Pool 765kV	Jabalpur	3000
Gwalior 765kV	Gwalior	3000
Vindhyachal Pool 765kV	Singrauli	3000
Total		22,000
Existing 400/220kV		
Jabalpur	Jabalpur	630

Name of Substation	District	Capacity (MVA)
Damoh	Damoh	630
Satna	Satna	630
Seoni	Seoni	630
Gwalior	Gwalior	945
Khandwa	Khandwa	630
Rajgarh	Dhar	630
Shujalpur	Shajapur	630
Itarsi	Hoshangabad	315
Bina	Sagar	315
Total		5,985

The ISTS network in Madhya Pradesh includes 10,340 Ckt-km of 765 kV and 12,261 Ckt-km of 400 kV lines that connect it to the intra-state transmission network within the state on the one side and the western grid on the other.

PLANNED INTER-STATE TRANSMISSION SYSTEM (ISTS)

To meet the growing power demand of Madhya Pradesh and to evacuate power from upcoming generating stations in a reliable manner, PGCIL have undertaken schemes to augment the capacity of the inter-state transmission network.

ADDITION IN TRANSFORMATION CAPACITY

In order to have adequate capacity to draw power from sources outside the state boundary, PGCIL has planned a transformation capacity addition of around 6,760 MVA in the next 4 years:

Table 18: Planned transformation capacity addition by PGCIL

Volatge level	Capacity (MVA)
765/400 kV	1,500
400/220 kV	5,260

TRANSMISSION LINE SCHEMES UNDER IMPLEMENTATION

2019 Ckt-km of 765 kV lines and 1880 Ckt-km of 400 kV lines are planned to be added to the ISTS in Madhya Pradesh by PGCIL,

while 1040 Ckt-km of 765 kV lines and 156 Ckt-km of 400 kV lines will be added under tariff based competitive bidding (TBCB) route. The details are given in the table below:

Table 19: Transmission Line Schemes under Implementation

Particulars	Ckt	Length (Ckt km)	Associated Project	Expected Commissioning
765 kV: PGCIL Schemes				
Rihand III – Vindhyachal Pool	2x SC	62	Vindhyachal IV and Rihand III STPS	2015
Vindhyachal Pool - Satna	SC	271		2015
Dharamjaygarh (Chattisgarh) – Jabalpur Pool	DC	848	Upcoming generation projects in Orissa	2015
Jabalpur Pool - Orai	DC	838	Strengthening WR – NR Link	2018
Total: 765 kV: PGCIL Schemes		2019		
765 kV: TBCB Schemes				
Gadarwara STPS – Jabalpur Pool	DC	240	Gadarwara STPS of NTPC (2x800 MW)	2018-19
Gadarwara STPS – Warora	DC	600		
Sasan UMPP- Vindhyachal Pool			Vindhyachal IV & V STPS	
Total: 765 kV: TBCB Schemes		1040		
400 kV: PGCIL Schemes				
Mauda II- Betul	DC	386	Mauda Stage II Generation Project (2x660 MW)	2016
Betul- Khandwa	DC	338		2016
Khandwa-Indore	DC	360		2016
RAPP - Shujalpur	DC	310		
Rajgarh-Karamsad(GETCO)	DC	486		
Total: 400 kV: PGCIL Schemes		1880		
400 kV: TBCB Schemes				
Gwalior- Morena	DC	100	Gwalior 765/400 kV Substation	
Vindhyachal-IV & V STPP – Vindhyachal Pool-2 nd Line	DC	56	Vindhyachal IV & V STPP (3x500MW)	
Total: 400 kV: TBCB Schemes		156		

INTRA STATE TRANSMISSION SYSTEM

1) Transmission Lines (Intra-state)

A summary of existing intra-state transmission lines in Madhya Pradesh and additions planned till FY 19 is given below:

Table 20: Existing & Future Intra-state Transmission Lines

Voltage	Length Ckt km		
	Existing	Additional by FY 19	% Increase
400 kV	3074	2079	68%
220 kV	11801	3132	27%
132 kV	15259	6415	42%

2) Transmission Substations (Intra-state)

A summary of existing intra-state transmission substations in Madhya Pradesh and additions planned till FY 19 is given

below:

Table 21: Existing & Future Intra-state Transmission Substations

Voltage	Capacity (MVA)		
	Existing	Additional by FY 19	% Increase
400/220 kV	6,720	5,040	75%
220/132 kV & 400/132kV	17,770	7,640	43%

Voltage	Capacity (MVA)		
	Existing	Additional by FY 19	% Increase
220/33 kV & 132/33kV	20,947	9256	44%

ADEQUACY OF TRANSMISSION SYSTEM

The total transformation capacities at different voltage levels – existing and future are summarized in the table below:

Table 22: Existing & Future Intra-state Transmission Substations

Voltage Ratio	Existing			Planned additions by FY 19			Cumulative Capacity in FY 19	% increase in capacity from present level
	PGCIL	MPPTCL	Total	PGCIL	MPPTCL	Total		
765/400 kV	22,000		22,000	1,500		1,500	23,500	7%
400/220 kV	5,985	6,720	12,705	5,260	5,040	10,300	23,005	81%
220/132 kV & 400/132 kV		17,770	17,770		7,640	7,640	25,410	43%
132/33kV & 220/33kV		20,947	20,947		9256	9,256	30,203	44%

Keeping in view that the capacity at 220 kV level and below is used entirely to meet the demand within the state, which is projected to grow from the existing level of 9598 MW to 12,643 MW projected in FY 19, an increase of 32%, the planned increase in capacity at x/33 kV (x=220; 132) at 44% seems to be adequate. Also the total capacity addition at y/132kV (y= 220;400) has been planned to increase by around 43%.

A load flow study was done in October, 2015. It simulated FY 19 conditions in the network,

considering an estimated peak demand of 13,465 MW, comfortably higher than the demand projected in this study. This demand is met by 5,180 MW supplied by the state's own generation capacity and the balance of 8,285 MW from MP's share in central generating stations and its share from independent power plants (IPPs) in the state. The study found eight 132 kV and two 220 kV lines would be overloaded in FY 19 conditions. MPPTCL have already planned requisite measures to remedy the situation.

FUND REQUIREMENT

The fund requirement for the planned network addition in the state is summarized below:

Table 23: Fund Requirement for State Transmission Projects (Rs. Crores)

No	Particulars	FY 16	FY 17	FY 18	FY 19	Total
A	EHV Transmission Lines					
1	400 KV	58	27	392	389	866
2	220 KV	155	477	414	668	1714
3	132 KV	429	343	932	540	2244
	SUB-TOTAL (LINES)	642	847	1738	1597	4824
B	EHV Sub-stations					
1	400 KV	171	296	206	195	868
2	220 KV	371	423	226	492	1512
3	132 KV	246	279	514	538	1577
	SUB-TOTAL (S/S)	788	998	946	1225	3957
C	Other EHV works	67	333	130	168	698
	Total MP Transco	1497	2178	2814	2990	9479

MAJOR INITIATIVES

IMPLEMENTATION OF SCADA SYSTEM AT EHV SUB-STATIONS

The transmission network of State of Madhya Pradesh is growing rapidly both in terms of size and complexity. This expansion is mainly driven by the phenomenal growth of demand of electric power, increasing number of players, location of generation pockets and implementation of open access policy. With state transmission network expansion, adoption of a dedicated system for on-line monitoring, measurement and control of complex transmission system network has become necessary. Such a system is also required to overcome challenges of operation and maintenance of state transmission system as 68% EHV substations operations are out sourced. Therefore it was decided to implement a State-of-the-Art Supervisory Control and Data Acquisition System (SCADA) to meet its requirements. Under this project Transmission SCADA Control Centres have been established in three cities namely Jabalpur, Bhopal & Indore. Due to implementation of SCADA System, significant improvement in the operational efficiency have been observed.

IMPLEMENTATION OF AUTOMATIC DEMAND MANAGEMENT SYSTEM

Another initiative taken in the State is to implement a State-of-the-Art Automatic Demand Management Scheme (ADMS). The ADMS shall meet the requirement of Automatic Demand Management of Discoms namely rotational load shedding & restoration thereof with the help of Transmission SCADA through approx. 3000 nos. 33 kV feeders emanating from EHV Sub-stations. Under this scheme, the electricity demand corresponding to schedule of distribution companies shall be controlled and managed by automatic switching (ON/OFF) of 33 kV feeders at EHV Sub-stations.

Under this scheme, groups in each Discom shall be operated in rotation and also the group operated feeders will be automatically normalized after one hour. Simultaneously, next group will operate to compensate. With the completion of the project, the State shall achieve a unique distinction of becoming **first State to install ADMS for requirement of Automatic Demand Management of Discoms through Transco SCADA System.**

ACTION POINTS FOR THE STATE

- State will continue to implement the projects on time to ensure availability of transmission system for 24 x 7 supply
- MPPTCL will continue to monitor the loading of lines and substations on periodic basis keeping in view the actual growth in loading of the load centers along with changes in consumer mix.
- The state will look for options for construction of new lines through tariff based competitive bidding (TBCB) and Public Private Partnership (PPP) route.
- State already has one Emergency Restoration System (ERS) and two more ERS are being procured and deployed for effectively restoring transmission lines in case of emergency.

GOVERNMENT OF INDIA INTERVENTION

- Central government should monitor that PGCIL will implement the capacity addition projects on time to ensure availability of transmission system for 24 x 7 supply.
- PGCIL is planning to add 500 MVA transmission capacity at Satna in FY 2017-18. It is requested to PGCIL that such capacity may be added at priority and may be available in FY 2016-17.
- PGCIL has planned 500 MVA capacity both in Itarsi and Indore which may also be completed at priority.
- For construction of 220 kV substation at Gora Bazar (Jabalpur), working permission for construction of line and substation is pending at Defense Estate Officer (DEO) Jabalpur. Same must be provided at the earliest.

CHAPTER 7: DISTRIBUTION PLAN

CONNECTING THE UNCONNECTED HOUSEHOLDS

As on November, 2015, out of total 51929 inhabitant villages, 51580 (99%) villages are already electrified and only 349 villages are left, out of which, 126 villages are yet to be sanctioned by Centre under off grid schemes.

The state has targeted to electrify all the villages in FY 16.

As discussed in earlier sections, there are around 52.86 un-electrified households in the state. State has also targeted to achieve 100% household electrification by end of

FY19.

EXISTING DISTRIBUTION SYSTEM

Discoms in Madhya Pradesh are currently serving around 1.17 crore households and providing 24 hours supply to all the non-agricultural consumers. Eastern zone Discom has the highest number of electrified households with around 44.52 lakh households.

A snapshot of the existing distribution system as on 31st March, 2015 is given below:

Table 24: Existing distribution system as on 31st March, 2015

Particulars	West	Central	East	Total
Number of 33/11 kv substations / transformers	1135	966	947	3048
Capacity of 33/11 kv substations (MVA)	9192	8497	7493	25182
Length of 33 kV lines (Ckt Kms)	14396	14703	16815	45914
Length of 11 kV lines (Ckt Kms)	100845	98893	113330	313068
Length of LT Lines (km)	150172	109537	145681	405390
Capacity of 11/0.4 kV Distribution Transformers (MVA)	11675	11175	7503	30353

METERING STATUS

State has a progressive target to get all its Feeders, DTR and household connections metered. The Madhya Pradesh Electricity Regulatory Commission has also been giving direction to the discoms to achieve 100% metering. So as to make the process faster options to outsource the metering of connections. Metering status in the state⁴ is as shown in the table below:

Table 25: Metering Status – Domestic rural

Particulars	Total conn	No. of un metered conn	% of un metered conn
East	2077798	371289	17.87%
West	1699594	129892	7.64%
Central	1150306	179006	15.56%
State Total	4927698	680187	13.80%

⁴ As on December 31, 2014

Table 26: Metering Status – Agricultural DTR

Particulars	Total pre dominant agricultural DTRs	DTRs with meters	% of metered DTRs
East	65737	3489	5.31%
West	93524	20426	21.84%
Central	100198	23112	23.07%
State Total	259459	47027	18.13%

Table 27: Feeder Metering Status

Particulars	Centre		West		East		Total	
	33 kV	11 kV	33 kV	11 kV	33 kV	11 kV	33 kV	11 kV
Total No. of energy Audit points	1489	3830	2382	5129	1575	3684	5446	12643
No. of feeders provided with energy audit meters	1371	3460	2382	4346	1575	3684	5328	11490
No. of feeders with defective meters	210	584	342	1009	97	265	649	1858
No. of feeders on which energy audit meters are yet to be provided	118	370	0	783	0	0	118	1153

PERFORMANCE OF DISCOMS

NETWORK RELIABILITY

DT failure: Distribution transformer failure rate for FY 15 for three Discoms is as shown in the table below:

Table 28: DT failure rate

Discom	East	West	Central
DT Failure rate	7.09%	17.98%	8.28%

DT failure rate for all the Discoms is at higher side and adequate measures need to be taken to keep a check on it.

SAIFI & SAIDI: To provide quality power to all its consumers, the Discoms shall adhere the SOP targets set by MPERC.

AT&C LOSSES

The distribution business incur losses of two different types: one is the technical losses and other one is the non-technical losses. The technical losses are due to energy dissipated in the conductors, equipment used for transmission line, transformer, sub-transmission line and distribution line and magnetic losses in transformers. The sum of both technical and non-technical is AT&C

losses which gives overall performance of the distribution company.

The AT&C losses at Discom boundary for Madhya Pradesh Discoms has reduced from 36.45% in FY 11 to 23.07% in FY 15, which is an overall reduction of more than 12% in 5 years. Further the state has already been able to achieve target of 100% collection efficiency.

Table 29: AT&C losses for previous years (%)

%	FY 11	FY 12	FY 13	FY 14	FY 15
Distribution losses	29.07	28.43	27.52	25.66	23.07
AT&C losses	36.45	30.99	27.52	25.66	23.07

For further period from till FY 19 the state has targeted to achieve the AT&C loss of 17%. Such loss targets have also been agreed with MOP. The yearly AT&C loss targets for the State Discoms is as shown in the table below:

Table 30: Target AT&C losses (%)

Discom	AT&C Loss Target (as per MoP)			
	FY 16	FY 17	FY 18	FY 19
West	22.38	20.40	18.41	16.27
Central	25.41	23.43	21.44	19.30
East	21.70	19.72	17.73	15.59
Total	23.15	21.15	19.15	17.00

To achieve 100% rural household electrification and to meet the AT&C losses targets, MP Discoms have planned the following investments.

INVESTMENTS PROPOSED

The Discoms have planned many investment schemes like feeder segregation, R-APDRP, System Strengthening (STN/TSP/SCSP), DDUGJY/RGGVY, Kisan Anudan Yojana (New Agricultural Pumps), etc.

System Strengthening: The focus is on the creation of new 33/11 kV substations, bifurcation of overloaded 33 kV feeders, feeder bifurcation as 11 kV level of agricultural feeder, additional/augmentation of PTRs, installation of DTRs, conversion of bare LT line into AB Cables and replacement of service lines etc.

Rural Electrification: The GoI has proposed to connect the un-connected households in every village in India. The basic facility of providing power to each household is very essential and the state has planned to achieve the same.

AT&C Loss reduction: Technical losses forming a part of distribution losses of the system are mainly due to poor infrastructure which needs strengthening, renovation and

up-gradation of the capacity of lines, sub-stations and associated infrastructure. Commercial losses on account of pilferage of energy can be reduced to a large extent by re-engineering the system, which requires capital investment and directed efforts.

SYSTEM STRENGTHENING AT SUB TRANSMISSION

The state Discoms have planned to invest Rs. 3,940 Crores from FY 16 to FY 19 towards system strengthening which is currently undertaken with the help of Madhya Pradesh Government.

Further, under EAP schemes have been planned by Discoms to invest Rs. 246 Crores by the end of FY 19.

The new IPDS scheme also aims to cover 20 new towns apart from additional augmentation works in the existing R-APDRP towns. The state has now accessed the requirement of strengthening of urban infrastructure and accordingly proposed work amounting to Rs. 1506 Crores to be undertaken under the IPDS scheme.

The east zone Discom has planned to invest Rs 495.33 Crores, west zone Discom of Rs 528.60 Crores and central Discom of Rs 482.30 Crores under this scheme.

Table 31: Detailed plan under IPDS

Sl. No.	Particulars	Unit	Project Cost (Rs. Crores)
1	33/11 KV S/S : New	Nos.	75.74
2	33/11 KV S/S : Additional Transformer	Nos.	10.08
3	33/11 KV S/S : Transformer capacity Enhancement	Nos.	23.16
4	Renovation & Modernisation of 33/11 kV SS	Nos.	55.55
5	New 33 KV New feeders/Bifurcation of feeders:	Kms.	74.19
6	33 KV feeders Reconductoring/Augmentation	Kms.	9.52
7	33 kV Line Bay Extension at EHV station	Nos.	10.26
8	11 kV Line : New Feeder/ Feeder Bifurcation	Kms.	168.72
9	11 kV Line : Augmentation/Reconductoring	Kms.	37.92
10	Arial Bunched Cable	Kms.	401.78
11	UG Cable	Kms.	16.03
12	11 KV Bay Extension	Kms.	1.8
13	Installation of Distribution Transformer	Nos.	101.77
14	Capacity Enhancement of LT sub-station	Nos.	41.23

Sl. No.	Particulars	Unit	Project Cost (Rs. Crores)
15	LT Line : New Feeder/ Feeder Bifurcation	Kms.	70.47
16	LT Line : Augmentation/Reconductoring	Kms.	30.07
17	Capacitor Bank	Nos.	5.25
18	HVDS	Nos.	7.4
19	Metering	Nos.	316.64
20	Provisioning of solar panel	Lot	1.91
21	RMU, Sectionaliser, Auto reclosures, FPI etc.	Lot	0.4
22	Others	Lot	48.86
GRAND TOTAL			1508.76

RURAL INFRASTRUCTURE

Earlier RGGVY scheme covered 846 villages in Madhya Pradesh. The state envisages that there is additional requirement for connecting the unconnected and strengthening of rural infrastructure and has accordingly been sanctioned amount of Rs. 2865 Crores to be undertaken under the DDUGJY scheme against following components:

- **Feeder Segregation:** Rs. 825.49 Crores
- **Strengthening of Rural Infrastructure:** Rs. 165.98 Crores
- **Connecting the Unconnected:** Rs. 1421.34 Crores.

Among the Discoms, east zone has planned to undertake Rs 968.82 Crores of investment under DDUGJY. Similarly, west zone has planned to invest Rs 934.65 Crores and central zone an amount of 961.78 Crores under this scheme.

As against the sanctioned amount of Rs. 2,865 crore under DDUGJY scheme the State had sought financial assistance of Rs. 8,472 Crores. The deficit amount of Rs. 5607 Crores needs to be funded from other sources.

ASSESSMENT OF ADEQUACY OF DISTRIBUTION SYSTEM

The transformation capacity at 33/11 kV level is projected to grow from 25,182 MVA in FY 2015 to 32,259 MVA in FY 2019.

The peak demand of the state, including demand of large industrial consumers at state periphery has been recorded at 9598 MW in FY 15. This peak demand is expected to reach at 12,643 MW in FY 19 i.e. an increase of around 32% as compared to the 28% of total increase in transformation capacity at 33/11 kV level.

Major increase in demand is expected for LT consumers on account of extensive household electrification. The transformation capacity at LT level (11/0.4 kV level) is planned to increase from 30,353 MVA to 42,708 MVA i.e. by around 41% which seems adequate.

However the demand at various load centres needs to be checked at regular intervals so as to maintain a reliable distribution system.

IT INITIATIVES TAKEN BY MP DISCOM

Meter Data Acquisition System-

Involves in collecting data from meters which are located at remote locations like substation feeder meters, distribution transformers (DTR), high tension (HT) consumers, low tension (LT) consumers and boundary meters (BM) and sending

these data to the servers and save it in the database. These data will be used for billing purpose and for generation of different type of analytical reports. Data acquired from the respective meters through MDAS will be used for monitoring important distribution parameters and accurate billing. As a result, MDAS will push this data to the Meter Data Management Module (which maintains the Meter Asset and Data Repository) for Validation and Analysis. The various instantaneous parameters and events reported by MDAS will help in generating exceptions and MIS reports for proper monitoring, planning and decision making and taking of corrective actions.

Consumer Care Services

Call centres have been set up in big towns and rural areas to provide consumers complaint booking facility, bill payment facility.

Measures adopted for improving customer satisfaction

- 1) **SMS & email based complaint booking facility.**
- 2) **SMS based Transformer Failure Information system**
- 3) **Web based Services**

- a. Applying for New Connection.
- b. Online Viewing and payment facility for Electricity bill.
- c. Online complaint booking.
- d. Energy Theft Reporting.

- 4) **Set up of Consumer care centres-** 42 costumer care centres have been setup in urban areas and 144 consumer care centres has been set up in rural areas to provide complaint booking and restoration services.
- 5) **SMS alert on 33 KV and 11 KV feeder Interruption-** A web based SMS alert is being developed for sending alerts to field EE's & SE's to act quickly for fault restoration and to minimize fault interruption period.
- 6) **Electricity bill payment facility through ATPs** (in urban areas) and bill payment through online payment facility, MP Online Kiosks & Bill Desk.

FUND REQUIREMENT

The fund requirement for state projects is summarized below:

Table 32: Fund Requirement for Distribution Projects (in Rs Crores)

S No.	Name of the Scheme	Completion	FY 16	Proposed (Funding)		Rs. Crore		Total
				FY 17	FY 18	FY 19		
GoMP Schemes								
1	Strengthening of Sub-Transmission & Distribution System (GoMP)	Continuous	1031.96	880.28	919.29	1109.01		3940.54
2	New Agricultural Pumps	Continuous	422.25	508.08	572.01	524.67		2027.01
EAP Schemes								
3	Feeder Separation Scheme	Jun'2017	606.86	443.16	591.00	0.00		1641.02
4	Strengthening of Sub-Transmission & Distribution System	2016	205.19	34.23	3.20	3.20		245.82
5	Renovation of 33/11kv Sub-	2017	220.00	271.34	0.00	0.00		491.34

S No.	Name of the Scheme	Completion	FY 16	Proposed (Funding)		Rs. Crore	
				FY 17	FY 18	FY 19	Total
	Stations & DTR metering						
GoI Schemes							
6	RAPDRP	Dec'2015	347.25	187.58	5.09	5.09	545.01
7	RGGVY	2019	307.14	599.61	543.05	449.37	1899.17
8	DDUGVY	2018	596.58	1107.98	1160.69	0.00	2865.25
9	IPDS	2018	321.82	788.53	398.41	0.00	1508.76
Other Schemes							
10	Others		0.00	0.00	0.00	0.00	0.00
	Total		4059.05	4820.79	4192.74	2091.34	15163.92
	Grant		1390.98	2156.14	1726.78	1029.07	6302.97
	Equity		309.59	264.08	275.78	332.70	1182.15
	Loan		2358.48	2400.57	2190.18	729.57	7678.80

ACTION POINTS FOR STATE

- 1) State will continue to implement the projects on time to ensure access to 24x7 power to each household.
- 2) State government has been making efforts to help Discoms in recovery of arrears. No dues certificate from Discoms has been made mandatory for the following:
 - To participate in Panchayati or Mahanagarpalika elections.
 - To participate in elections of cooperative societies.
 - For obtaining the license of guns/arms.
 - For obtaining or renewing the license for Mining.

Copy of relevant government orders have been annexed (Annexure – 3) to this document. Special armed forces were also deployed to reduce theft and increase the revenue collection in State.

State shall take further steps to link maximum services with payment of electricity dues.

- 3) State shall explore the schemes to attract the consumers to take authorized connections.

- 4) There are around 4 lakh temporary connection in the State. State has an ambitious plan to convert such temporary connections into permanent connection by June, 2018. Following benefits are expected from such plan:

- Infrastructure development
- Increase in revenue realisation by around Rs. 21,000 per connection (annual).
- Reduction in transformer overloading.
- Reduction in technical losses

GOVERNMENT OF INDIA INTERVENTION

- 1) Under DDUGJY scheme the State has sought financial assistance of Rs. 8472 Crores, against the same an amount of only Rs. 2865 Crores has been sanctioned to the State.

Madhya Pradesh covers over 7% of countries population and 9% of total area. Whereas it has been sanctioned only 5% of the budgeted outlay for DDUGJY in the country.

It is requested that the grant component may be enhanced by at least Rs. 1720 Crores i.e. total of Rs. 2867 crore additional sanctioned amount to achieve

the target of 100% electrification in rural areas otherwise the poor financial health of the Discoms shall continue.

- 2) Central Government is further requested to finalize the material procurement under DDUGJY and IPDS schemes so that the State can issue tenders at the earliest.
- 3) Considering such a large size of the state it is suggested that a relaxation of 2% in AT&C losses may be allowed.
- 4) It is requested to the Centre that the interest rate on working capital and

capital expenditure loans from PFC & REC to be lower down to 7%.

It is requested to the Centre to provide adequate support from PSDF for development and strengthening of transmission / distribution network.

The request of Government of Madhya Pradesh for funds under various schemes would be considered by Government of India as per its policies/ frameworks or otherwise Government of Madhya Pradesh will make efforts to arrange funding from FIs/ Banks/ Multilateral funding agencies.

CHAPTER 8: RENEWABLE ENERGY INITIATIVES

Madhya Pradesh is part of Green Energy Corridor. It has a total renewable energy potential of approximately 30 GW from different sources. To tap this potential, state has proactively supported private participation in development of projects by ensuring “Ease of Doing Business” in the state, supportive policies, regulatory environment, support from state power utilities and other state departments. Investor friendly environment with simple land allocation procedures, no permission for construction from local bodies, no surprise land or project related inspection, standardized simple documentation, web based project clearance & monitoring system, no environment impact assessment required for Solar, Wind and Small Hydro.

Some of the key advantages to the state:

- ✓ The state has large rivers such as Tawa, Narmada, Chambal, Tapi flowing through the State providing ample hydro potential.
- ✓ High solar radiation with more than 300 days of clear sun and solar potential up to 6.2 kWh/sq.m./day
- ✓ Ample non forest barren land available in 32 districts of the state
- ✓ MP has a gross wind potential of almost 3000 MW
- ✓ Biomass opportunities are present at most districts in the state with potential of around 1400 MW.

ACHIEVEMENTS IN RENEWABLE ENERGY

By end of March, 2015 the state had a renewable generation capacity of around 1020 MW.

PPAs are being done to explore more renewable energy potential in the State, and it is anticipated to add around 4867 MW renewable capacity till end of FY 17.

Some of the incentives under different policies in the state which will help development of renewable energy are:

Commercial and Financial

- a. No Electricity Duty for first 10 Years
- b. No Electricity Cess for first 10 Years
- c. Third part/Captive sale is allowed
- d. Sale outside the state permitted (Solar)
- e. 100% banking is permitted
- f. Wheeling charges reduced to 2%
- g. No VAT and entry tax
- h. Benefits of Industry Status
- i. Reduction in contract demand
- j. 100% CDM benefit to developer

Land Related

- a. Bankable document for revenue land (on right to use basis)
- b. Only application is required in conversion to NA land usage status
- c. 50% stamp duty exemption on private land purchase

RENEWABLE ENERGY POLICIES IN THE STATE

Following are the existing policies in the State to encourage the capacity addition through renewable energy sources:

Table 33: Different policies for different technologies

Policy	Year
Small Hydel Policy	November 2011
Wind Power	January 2012
Biomass based Power	April 2013
Solar Power	July 2012
Solar Park	January 2013

Government of Madhya Pradesh has been providing incentives to investors / developers for promoting the setting up of renewable energy based power plants as per the Energy Policy of the State.

GREEN CORRIDOR

Transmission system strengthening works under green corridor of Rs. 3575 crore are proposed to be undertaken in two phases:-

1) Phase-I Works (Rs 2100 Crore)

To be completed within 3 year for evacuation of RE power of 4100MW. Works now included in Green Energy corridor Project.

2) Phase-II Works (Rs 1475 Crore)

To be completed within next 2 year after first phase.

RE Interconnection Works of Rs. 1125 Crore for interconnection of the RE project from developer pooling station to MP Grid is to be taken up by Developers at their cost or by MPPTCL at cost of developer.

As of now the principle approval has been given by KfW for loan assistance. Department of Economic Affairs (DEA) is expected to expedite loan approval.

SOLAR ENERGY

Implementation of solar power based projects in Madhya Pradesh 2012 (Policy 2012)

The policy encourages private participation in development of solar projects. Provide incentives and benefits to the developer. Four categories of solar projects has been created under this policy, 1st project selected as per the competitive bidding process by discoms in M.P, 2nd projects set up for captive use of power to 3rd party within or outside state, project set up under REC mode and 4th under projects under JNNSM.

WIND ENERGY

Madhya Pradesh needed a new policy towards development of wind energy in the state, the new policy for wind energy has been developed under **Wind Power Project Policy of Madhya Pradesh -2012.**

The policy has been made to tap the potential of wind energy at 3000 MW. The Government of Madhya Pradesh has been encouraging Wind power as an additional, alternate source of energy and has notified an investor friendly policy for the development of Wind power projects in the state. Further, the New & Renewable Energy Department has initiated an extensive Wind resource assessment program with support from MNRE.

HYDEL POWER

(Policy for implementation of Small Hydel-Power based electricity projects in Madhya Pradesh, 2011)

This policy has been developed for small hydel power projects (SHPs) up to 25 MW capacity which have been identified by the Water Resources Department, Narmada Valley Development Authority, Madhya Pradesh Power Generation Company, any other government agency or any private agency. This policy is applicable to all the projects which had been allotted by Madhya Pradesh Electricity Board or Water Resources Department for the development of small hydel power projects under incentive policy.

BIOMASS

Madhya Pradesh Biomass based Electricity (Power) Project Implementation Policy, 2011

The allotment of new projects under the policy shall be done by department by inviting applications time to time, keeping the area of 25 km radius reserved for the project sites registered with the department.

Allotment of project will be made for the particular site on the basis of maximum free energy per MW offered to (GoMP) by the developer and maximum capacity of any project shall not exceed 15 MW.

After the introduction of these new policies installed capacity grew to 357% from March, 2012 to July, 2015. This is further expected to increase by more than 4,800 MW by March 2017.

Table 34: Planned renewable capacity (cumulative) (MW)

Source	FY 16	FY 17	FY 18	FY 19
Solar	1055.25	2105.25	2105.25	2105.25
Wind	2485.05	3485.05	3485.05	3485.05
Bio Mass/Bio gas	121.40	141.40	141.40	141.40
Other Small Hydro	105.46	155.46	155.46	155.46
Total	3767.16	5887.16	5887.16	5887.16

CHAPTER 9: ENERGY CONSERVATION AND ENERGY EFFICIENCY PROGRAM

DEMAND SIDE MANAGEMENT

Demand side management (DSM) means controlling or managing the consumer load so as to smoothen the demand curve of the distribution utilities. A smooth demand curve helps the utility plan its advance drawl schedule in accordance with merit order dispatch of its generating sources and also to optimize the power purchase cost by reducing unscheduled interchange or deviation charges. The state strive towards achieving a smooth or somewhat flat load curve by relying on DSM. Scope of various activities under different sectors to take DSM measures are summarized as follows:

Table 35: Scope of DSM measures in different sectors

Area	Activities
Municipal Sector	Lighting Pumping PF Correction
Agricultural Sector	Lighting Pumping
Government Buildings	Air Conditioning Lighting PF Correction
Multistory Complexes	Energy Efficient Building Construction
Commercial Buildings	Lighting PF Correction
Industries	Energy Efficient Appliances PF Correction
Promotion of Solar Power	For all sectors
Reduction of T&D Losses	On Substations Distribution Network
Efficiency Improvements in Thermal Power Stations	All State Generating Units

DOMESTIC EFFICIENT LIGHTING PROGRAM (DELP)

Execution of energy efficiency program through LED bulbs is being given the highest priority by GoI. In order to encourage energy efficiency and its conservation in the State, it has been proposed to implement Domestic Efficient Lighting Program (DELP) wherein LED bulbs will be given to households at a lower rate.

The State has an ambition plan to provide LED bulbs to approximately 82 lakh domestic consumers in the State. The project was initially to be undertaken by Energy Efficiency Services Limited (EESL). However, this activity shall now be undertaken by Madhya Pradesh Urja Vikas Nigam Limited under the Energy Conservation Act 2001, for undertaking energy efficiency and management programs in the State.

MPUVNL is having grant of Rs. 35 Crores from NITI Aayog to supply LED bulbs to domestic consumers and the same shall be utilized under DELP. The said grant can be used as mobilization advance in the tender for procurement of LED bulbs, and also to incentivize the low-income domestic customers for shifting to LED bulbs. MoU is signed by MPUVN with EESL for further implementing the DELP in State through joint investment.

ISI / BEE STAR RATED AGRICULTURAL PUMPSETS

The Discoms also give tariff rebate to metered agricultural consumers who use ISI/ BEE star labelled agricultural pump sets. The following rebates are given:

Particulars of Energy Saving Devices	Rate of rebate
ISI / BEE star labeled motors for pump sets.	15 paise per unit
ISI / BEE star labeled motors for pump sets and use of frictionless PVC pipes and foot valve.	30 paise per unit
ISI / BEE star labeled motors for pump sets and use of frictionless PVC pipes and foot valves along with installation of shunt capacitor of appropriate rating.	45 paise per unit

TARIFF BASED DSM MEASURES

In accordance with the applicable ToD tariff in MP, the Discoms also levy surcharge/allow rebate during peak and off peak load hours:

- Evening peak load period (6 PM to 10 PM): 5% of normal rate of energy charge as surcharge, and
- Off peak load period (10 PM to 6 AM next day): 15% normal rate of energy charge as rebate.

Besides these, the Discoms also recover additional charges from consumers for exceeding their demand. The main purpose of this charge is to encourage the consumers to limit their demand only up to sanctioned/contract demand.

STREET LIGHT NATIONAL PROGRAM (SLNP)

Energy Efficiency Service Ltd. (EESL) has also been tasked with implementing the Street Light National Program, which was launched by Hon'ble Prime Minister. Under this program EESL would replace conventional street lights with efficient and smart LED lights. The entire upfront investment, under this program would be done by EESL and will be recovered from municipalities over a period of 5-7 years, from savings in energy and maintenance cost.

GOVERNMENT OF INDIA INTERVENTION

Under the guidance of the Bureau of Energy Efficiency, Ministry of Power the State Designated Agency has so far used two methods to encourage energy efficiency,

- a. By spreading awareness
- b. By doing few demonstration projects to showcase energy efficiency

It is high time that the Central Government may take the following actions:

- a. Ask the State Government to set targets of DSM and energy efficiency in specific measurable units (Megawatts & Million Units)
- b. Monitor the implementation of year wise action plans of energy efficiency in the State on a regular basis.
- c. Ask the State Government to convert the distribution network of electricity into State wide distributed profit centers. Under such an arrangement.
 - i. The individual distribution sub-division of a distribution utility shall be an independent profit center with an independent balance sheet.
 - ii. The profit center should be allowed to retain certain percentage of revenue earned by the individual sub-division and should be allowed to spend it on reducing the T&D losses of the distribution network under its control.
 - iii. The individual profit centers should be asked to act on an action plan to retrofit their sub-stations with energy efficient technologies

CHAPTER 10: FINANCIAL VIABILITY OF DISTRIBUTION COMPANY

FINANCIAL POSITION OF DISTRIBUTION UTILITIES

The existing accumulated loss for the State distribution utilities based on their provisional audited accounts for FY 15 stands at Rs. 28,777 Crores. In contrast to its historical accumulated losses, in the FY 15 the utilities has booked a net loss of Rs 4,950 Crores on stand-alone basis.

A detailed scenario analysis has been done to measure the financial performance in coming years.

This analysis provided hereafter decipher that, with improvement in performance to the required levels, the utilities will be able to recover its accumulated losses while targeting to provide 24x7 power supply to all in the State. The calculations have been done under different scenarios as detailed subsequently in this chapter.

The existing Profit and Loss statement for each of the distribution utility is given below:

Table 36: Profit and Loss Statement of the distribution licensees FY 15 (Rs. Crores)

Particulars	West	Central	East	Total
Income				
Sales turnover	8,268.70	6381.42	6681.96	21332.08
Net sales	8268.70	6381.42	6681.96	21332.08
Other income	58.58	155.02	418.13	631.73
Total Income	8327.28	6536.44	7100.09	21963.81
Expenditure				
Transmission Charges	807.89	720.57	754.88	2283.33
Power & Fuel Cost	7285.35	6152.97	5883.51	19321.83
Employee Cost	752.87	808.50	824.02	2385.40
R&M cost	99.24	33.59	66.00	198.83
Selling and Admin Expenses	125.98	89.90	146.89	362.77
Miscellaneous Expenses	87.14	200.97	-120.75	167.37
Total Expenses	9158.48	8006.50	7554.54	24719.52
Operating profit	-831.20	-1470.06	-454.45	-2755.71
PBDIT	-831.20	-1470.06	-454.45	-2755.71
Interest	201.83	259.88	258.61	720.32
PBDT	-1033.03	-1729.94	-713.06	-3476.03
Depreciation	181.25	196.33	358.71	736.29
Exceptional Items	-152.83	379.30	-111.95	114.52
Profit Before Tax	-1061.45	-2305.57	-959.82	-4326.84
Provision		422.45	200.82	623.27
PBT (Post Extra-ord Items)	-1061.45	-2728.02	-1160.64	-4950.11
Reported Net Profit	-1061.45	-2728.02	-1160.64	-4950.11
Accumulated Losses	-8795.00	-11401.07	-8581.51	-28777.58

STATE FUNDED FINANCIAL RESTRUCTURING PLAN

Madhya Pradesh has evolved as one of the model State in the Power Sector, giving 24x7 supply to all non-agricultural consumers and 10 hours power to farmers. Government of Madhya Pradesh has made several efforts to support its Discoms. While Discoms of other States have huge liabilities towards Banks and Financial Institutions, Madhya Pradesh Discoms were provided financial support in terms of equity, loan and timely subsidy. Government of Madhya Pradesh has even fulfilled working capital requirement of the Discoms to meet their shortfall. It has provided financial support of around Rs. 60,000 crore to discoms since FY 12. Leaving aside tariff subsidy, the financial support in terms of grant, equity and loan comes to around Rs. 44,000 crore during the same period.

Under State FRP, the following measures were taken:-

- 1) Conversion of outstanding capital and working capital loans from GoMP, as on 31.3.2011, into perpetual loan.
- 2) Retention of ED and Cess for the next three years (FY 12, FY 13 and FY 14) and conversion of this outstanding ED and Cess into perpetual loans; and
- 3) Retention of power purchase payables for Sardar Sarovar for next three years (FY 12, FY 13 and FY 14) and conversion of these outstanding payables into perpetual loans.

An interest holiday for three years (FY 12, FY 13 and FY 14) to ensure that the distribution companies have some relief in the cash flows. Thereafter, the interest rate to be charged equivalent to the current base rate of State Bank of India.

State government has already extended the period of FRP by three years from FY 14 to FY 17.

Huge financial support provided by Govt. of Madhya Pradesh to M.P. Discoms cannot be sustained unless FRBM limits are relaxed for the State. It is requested that the limit of FRBM for Madhya Pradesh be relaxed by 1 % to meet the requirements of Power Sector to facilitate the required funding.

It is also requested to the Centre that the interest rate on working capital and capital expenditure loans from PFC & REC to be lower down to 7%.

The State has also given an in-principal nod to the Ministry of Power to participate in UDAY (Ujwal DISCOM Assurance Yojna). However as most of the loans of Discoms in State are already supported by State Government. The modalities to take benefit from UDAY shall be worked out.

SCENARIO ANALYSIS

Based on the road map discussed in the previous chapters, various scenarios have been prepared to understand the sensitivity analysis of targeted parameters. However, the impact analysis on financial position has been restricted up to FY 19 as the projections of key drivers of expense and revenue items as power purchase mix and sales mix has not been projected beyond FY 19.

The following scenarios have been detailed in subsequent sections:

- i. At targeted growth rate as per “24x7 Power for All” road map (base case).
- ii. At targeted growth rate as per “24x7 Power for All” road map but with minimum tariff hike in future years.
- iii. At targeted growth rate as per “24x7 Power for All” along with financial turnaround.
- iv. At targeted growth rate as per “24x7 Power for All” road map with funding of

proposed investments in distribution through State funds and financial institutions.

- v. Non-Adherence to loss reduction trajectory and subsequent dependence on higher tariff hike

COMMON ASSUMPTIONS

- ✓ Any change in the power purchase cost will be taken care by the fuel and power purchase cost adjustment mechanism.
- ✓ Escalation towards Employee expenses has been considered at 10% and A&G expenses at 6% based on year on year increase in CPI/WPI inflation index in FY 14.
- ✓ R&M expenses have been escalated in proportion to the corresponding increase in GFA.
- ✓ Phasing of capital expenditure in IPDS and DDUGJY schemes has been considered as envisaged by distribution companies.
- ✓ Asset additions has been considered as 50% in same year of capital expenditure. Interest is calculated on assets capitalized only and no IDC has been considered.
- ✓ Interest computations has been done as per the existing loan profile of Discoms and addition of new loans at 13% of interest rate. Interest on perpetual FRP loan has been considered only from FY 18 at base rate of SBI.
- ✓ Interest rate for working capital loans has been considered at 13.75%.

- ✓ Category-wise average billing rate for computation of revenue for FY 16 and onwards has been taken as per the latest tariff order for FY 16.
- ✓ Transmission charges has been escalated in proportion to the increase in power purchase quantum and allocation.
- ✓ For new assets, depreciation has been calculated @ 5.28% and for the existing assets the depreciation has been calculated at the actual average depreciation rate of FY 15.
- ✓ Non-tariff Income has been projected to increase at 5% annually.
- ✓ The average cost of supply has been computed after deducting non-tariff income from the expenses.
- ✓ Debt: Equity ratio is 70:30 wherever applicable for internal schemes.
- ✓ Rate for selling surplus power has been considered as Rs. 3.00 / kWh.
- ✓ For IPDS and DDUGJY, ratio of Grant: Loan: Equity is 60:30:10 is as per the provisions of the respective schemes (except scenario 4 where no grant has been considered against IPDS and DDUGJY).
- ✓ It has been considered that if discoms are able to achieve the performance targets the additional amount a component of loan as per the DDUGJY & IPDS shall be converted into grant.

The capital expenditure pertaining to energy efficiency measures has not been considered as either these schemes are primarily funded through grant or have short payback period, thus having negligible impact on the financials of the distribution company.

SCENARIO A: AT TARGETED GROWTH RATE AS PER 24X7 ROAD MAP (BASE CASE)

ASSUMPTIONS

- ✓ No tariff hike
- ✓ T&D losses as per targeted trajectory.

Table 37: Assumptions for Scenario A

Year	Units	FY 16	FY 17	FY 18	FY 19
Energy Related Assumptions					
Energy Requirement (At State Periphery)	MU	62,342	68,193	74,098	80,847
Sales	MU	46,558	52,252	58,217	65,208
AT&C losses	%	23.15%	21.15%	19.15%	17.00%
Distribution Losses	%	23.15%	21.15%	19.15%	17.00%
Transmission Losses	%	2.82%	2.82%	2.82%	2.82%
Collection Efficiency	%	100.00%	100.00%	100.00%	100.00%
Power purchase	MU	77,328	87,473	90,725	98,587
Sale of Surplus Power	MU	14,986	19,281	16,627	17,741
Power purchase cost	Rs /kWh	3.38	3.49	3.53	3.56
Revenue parameters					
Tariff Increase	%	0.00%	0.00%	0.00%	0.00%
Average Billing Rate	Rs /kWh	5.32	5.31	5.30	5.30
Expense					
Employee Cost Escalation	%	10%	10%	10%	10%
Administrative & General Escalation	%	6%	6%	6%	6%

Table 38: Financial position for Scenario A

Particulars	FY 16	FY 17	FY 18	FY 19
Income				
Sales Turnover	₹ 24,790.11	₹ 27,736.32	₹ 30,875.60	₹ 34,552.16
Net Sales	₹ 24,790.11	₹ 27,736.32	₹ 30,875.60	₹ 34,552.16
Other Income	₹ 663.32	₹ 696.48	₹ 731.31	₹ 767.87
Sale of surplus power	₹ 4,495.88	₹ 5,784.17	₹ 4,988.13	₹ 5,322.19
Total Income	₹ 29,949.30	₹ 34,216.98	₹ 36,595.04	₹ 40,642.23
Expenditure				
Transmission Charges	₹ 2,560.62	₹ 2,802.02	₹ 3,046.88	₹ 3,327.52
Power & Fuel Cost	₹ 26,174.28	₹ 30,550.23	₹ 32,049.69	₹ 35,117.42
Employee Cost	₹ 2,623.94	₹ 2,886.33	₹ 3,174.96	₹ 3,492.46
R&M cost	₹ 225.94	₹ 259.86	₹ 300.22	₹ 335.77
Administrative & General Expenses	₹ 384.55	₹ 407.63	₹ 432.11	₹ 458.05
Miscellaneous Expenses	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Total Expenses	₹ 31,969.33	₹ 36,906.07	₹ 39,003.87	₹ 42,731.21
Operating Profit	-₹ 2,020.02	-₹ 2,689.10	-₹ 2,408.83	-₹ 2,088.98
PBDIT	-₹ 2,020.02	-₹ 2,689.10	-₹ 2,408.83	-₹ 2,088.98

Particulars	FY 16	FY 17	FY 18	FY 19
Interest	₹ 1,494.16	₹ 2,662.19	₹ 6,502.83	₹ 8,127.77
PBDT	-₹ 3,514.18	-₹ 5,351.28	-₹ 8,911.66	-₹ 10,216.75
Depreciation	₹ 737.03	₹ 874.40	₹ 1,019.59	₹ 1,141.34
Exceptional Items	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Profit Before Tax	-₹ 4,251.21	-₹ 6,225.69	-₹ 9,931.25	-₹ 11,358.10
Provision	₹ 247.90	₹ 277.36	₹ 308.76	₹ 345.52
PBT (Post Extra-ord Items)	-₹ 4,499.11	-₹ 6,503.05	-₹ 10,240.01	-₹ 11,703.62
Reported Net Profit	-₹ 4,499.11	-₹ 6,503.05	-₹ 10,240.01	-₹ 11,703.62
Accumulated Losses	-₹ 33,276.69	-₹ 39,779.74	-₹ 50,019.75	-₹ 61,723.37

Based on the above assumptions, it is evident that if state adheres to the PFA Roadmap targets and reduction of Distribution losses, the accumulated financial losses will increase to **Rs. 61,723 Crores in FY 19 from Rs. 28,777 Crores in FY 15.**

Based on the above scenario, it is evident that consistent tariff hike is also required to achieve the financial turnaround.

SCENARIO B: PRACTICAL SCENARIO (CONSIDERING 5% TARIFF INCREASE IN FY 17 AND NO TARIFF HIKE IN FY 18 & FY 19)

ASSUMPTIONS

- ✓ AT&C losses as per the targeted trajectory.
- ✓ Tariff Hike of 5% in FY 17 and 0% in FY 18 & FY 19.

Table 39: Assumptions for Scenario B

Year	Units	FY 16	FY 17	FY 18	FY 19
Energy Related Assumptions					
Energy Requirement (At State Periphery)	MU	62,342	68,193	74,098	80,847
Sales	MU	46,558	52,252	58,217	65,208
AT&C losses	%	23.15%	21.15%	19.15%	17.00%
Distribution Losses	%	23.15%	21.15%	19.15%	17.00%
Transmission Losses	%	2.82%	2.82%	2.82%	2.82%
Collection Efficiency	%	100.00%	100.00%	100.00%	100.00%
Power purchase	MU	77,328	87,473	90,725	98,587
Sale of Surplus Power	MU	14,986	19,281	16,627	17,741
Power purchase cost	Rs /kWh	3.38	3.49	3.53	3.56
Revenue parameters					
Tariff Increase	%	0.00%	5.00%	0.00%	0.00%
Average Billing Rate	Rs /kWh	5.32	5.57	5.57	5.56
Expense					
Employee Cost Escalation	%	10%	10%	10%	10%
Administrative & General Escalation	%	6%	6%	6%	6%

Table 40: Financial position for Scenario B

Particulars	FY 16	FY 17	FY 18	FY 19
Income				
Sales Turnover	₹ 24,790.11	₹ 29,123.14	₹ 32,419.38	₹ 36,279.77
Net Sales	₹ 24,790.11	₹ 29,123.14	₹ 32,419.38	₹ 36,279.77
Other Income	₹ 663.32	₹ 696.48	₹ 731.31	₹ 767.87
Sale of surplus power	₹ 4,495.88	₹ 5,784.17	₹ 4,988.13	₹ 5,322.19
Total Income	₹ 29,949.30	₹ 35,603.79	₹ 38,138.82	₹ 42,369.84
Expenditure				
Transmission Charges	₹ 2,560.62	₹ 2,802.02	₹ 3,046.88	₹ 3,327.52
Power & Fuel Cost	₹ 26,174.28	₹ 30,550.23	₹ 32,049.69	₹ 35,117.42
Employee Cost	₹ 2,623.94	₹ 2,886.33	₹ 3,174.96	₹ 3,492.46
R&M cost	₹ 225.94	₹ 259.86	₹ 300.22	₹ 335.77
Administrative & General Expenses	₹ 384.55	₹ 407.63	₹ 432.11	₹ 458.05
Miscellaneous Expenses	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Total Expenses	₹ 31,969.33	₹ 36,906.07	₹ 39,003.87	₹ 42,731.21
Operating Profit	-₹ 2,020.02	-₹ 1,302.28	-₹ 865.05	-₹ 361.37
PBDIT	-₹ 2,020.02	-₹ 1,302.28	-₹ 865.05	-₹ 361.37

Particulars	FY 16	FY 17	FY 18	FY 19
Interest	₹ 1,494.16	₹ 2,461.70	₹ 6,028.90	₹ 7,308.18
PBDT	-₹ 3,514.18	-₹ 3,763.99	-₹ 6,893.95	-₹ 7,669.56
Depreciation	₹ 737.03	₹ 874.40	₹ 1,019.59	₹ 1,141.34
Exceptional Items	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Profit Before Tax	-₹ 4,251.21	-₹ 4,638.39	-₹ 7,913.54	-₹ 8,810.90
Provision	₹ 247.90	₹ 291.23	₹ 324.19	₹ 362.80
PBT (Post Extra-ord Items)	-₹ 4,499.11	-₹ 4,929.62	-₹ 8,237.74	-₹ 9,173.70
Reported Net Profit	-₹ 4,499.11	-₹ 4,929.62	-₹ 8,237.74	-₹ 9,173.70
Accumulated Losses	-₹ 33,276.69	-₹ 38,206.32	-₹ 46,444.05	-₹ 55,617.75

Minimum or no tariff hike is expected in FY 18 & FY 19 due to upcoming state & central elections in FY 18 & FY 19.

Based on the above assumptions, it is evident that if state adheres to the PFA Roadmap targets and reduction of Distribution losses, the accumulated financial losses will increase to **Rs. 55617 Crores in FY 19 from Rs. 28,777 Crores in FY 15**. And the operating annual loss will increase to **Rs. 9174 Crores** from current level of **Rs. 4950 Crores**.

SCENARIO C: AT TARGETED GROWTH RATE AS PER 24X7 ROAD MAP PLUS FINANCIAL TURNAROUND

ASSUMPTIONS

- ✓ Tariff Hike of 8.09% every year from FY 17 to FY 19 on latest category-wise average billing rates approved by the Commission for FY 16.
- ✓ T&D losses as per targeted trajectory.

Table 41: Assumptions for Scenario C

Year	Units	FY 16	FY 17	FY 18	FY 19
Energy Related Assumptions					
Energy Requirement (At State Periphery)	MU	62,342	68,193	74,098	80,847
Sales	MU	46,558	52,252	58,217	65,208
AT&C losses	%	23.15%	21.15%	19.15%	17.00%
Distribution Losses	%	23.15%	21.15%	19.15%	17.00%
Transmission Losses	%	2.82%	2.82%	2.82%	2.82%
Collection Efficiency	%	100.00%	100.00%	100.00%	100.00%
Power purchase	MU	77,328	87,473	90,725	98,587
Sale of Surplus Power	MU	14,986	19,281	16,627	17,741
Power purchase cost	Rs /kWh	3.38	3.49	3.53	3.56
Revenue parameters					
Tariff Increase	%	0.00%	8.09%	8.09%	8.09%
Average Billing Rate	Rs /kWh	5.32	5.74	6.20	6.69
Expense					
Employee Cost Escalation	%	10%	10%	10%	10%
Administrative & General Escalation	%	6%	6%	6%	6%

Table 42: Financial position for Scenario C

Particulars	FY 16	FY 17	FY 18	FY 19
Income				
Sales Turnover	₹ 24,790.11	₹ 29,980.19	₹ 36,073.35	₹ 43,634.68
Net Sales	₹ 24,790.11	₹ 29,980.19	₹ 36,073.35	₹ 43,634.68
Other Income	₹ 663.32	₹ 696.48	₹ 731.31	₹ 767.87
Sale of surplus power	₹ 4,495.88	₹ 5,784.17	₹ 4,988.13	₹ 5,322.19
Total Income	₹ 29,949.30	₹ 36,460.84	₹ 41,792.79	₹ 49,724.75
Expenditure				
Transmission Charges	₹ 2,560.62	₹ 2,802.02	₹ 3,046.88	₹ 3,327.52
Power & Fuel Cost	₹ 26,174.28	₹ 30,550.23	₹ 32,049.69	₹ 35,117.42
Employee Cost	₹ 2,623.94	₹ 2,886.33	₹ 3,174.96	₹ 3,492.46
R&M cost	₹ 225.94	₹ 259.86	₹ 300.22	₹ 335.77
Administrative & General Expenses	₹ 384.55	₹ 407.63	₹ 432.11	₹ 458.05
Miscellaneous Expenses	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Total Expenses	₹ 31,969.33	₹ 36,906.07	₹ 39,003.87	₹ 42,731.21
Operating Profit	-₹ 2,020.02	-₹ 445.23	₹ 2,788.92	₹ 6,993.54
PBDIT	-₹ 2,020.02	-₹ 445.23	₹ 2,788.92	₹ 6,993.54

Particulars	FY 16	FY 17	FY 18	FY 19
Interest	₹ 1,494.16	₹ 2,337.81	₹ 5,345.85	₹ 5,405.18
PBDT	-₹ 3,514.18	-₹ 2,783.04	-₹ 2,556.93	₹ 1,588.36
Depreciation	₹ 737.03	₹ 874.40	₹ 1,019.59	₹ 1,141.34
Exceptional Items	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Profit Before Tax	-₹ 4,251.21	-₹ 3,657.44	-₹ 3,576.52	₹ 447.02
Provision	₹ 247.90	₹ 299.80	₹ 360.73	₹ 436.35
PBT (Post Extra-ord Items)	-₹ 4,499.11	-₹ 3,957.24	-₹ 3,937.25	₹ 10.67
Reported Net Profit	-₹ 4,499.11	-₹ 3,957.24	-₹ 3,937.25	₹ 10.67
Accumulated Losses	-₹ 33,276.69	-₹ 37,233.94	-₹ 41,171.19	-₹ 41,160.52

Based on the above assumptions, it is evident that even if state adheres to the target electrification and reduction of losses, **it has to still depend on the high tariff hike to the tune of 8.09% from FY 17 to FY 19** so that all of the distribution companies can start earning overall profit from FY 19 onwards. Accumulated losses at end of FY 19 will still be at level of Rs. 41,160 Crores.

SCENARIO D: AT TARGETED GROWTH RATE AS PER 24X7 ROAD MAP PLUS FINANCIAL TURNAROUND-PROPOSED INVESTMENTS FUNDED THROUGH LOAN & EQUITY ONLY

ASSUMPTIONS

- ✓ The proposed investments under IPDS and DDUGJY are funded through debt and equity in ratio 70:30.
- ✓ Higher Tariff Hike of 8.45% each in FY 17 to FY 19 on latest category-wise average billing rates approved by the Commission for FY 16.
- ✓ T&D losses as per targeted trajectory.

Table 43: Assumptions for Scenario D

Year	Units	FY 16	FY 17	FY 18	FY 19
Energy Related Assumptions					
Energy Requirement (At State Periphery)	MU	62,342	68,193	74,098	80,847
Sales	MU	46,558	52,252	58,217	65,208
AT&C losses	%	23.15%	21.15%	19.15%	17.00%
Distribution Losses	%	23.15%	21.15%	19.15%	17.00%
Transmission Losses	%	2.82%	2.82%	2.82%	2.82%
Collection Efficiency	%	100.00%	100.00%	100.00%	100.00%
Power purchase	MU	77,328	87,473	90,725	98,587
Sale of Surplus Power	MU	14,986	19,281	16,627	17,741
Power purchase cost	Rs /kWh	3.38	3.49	3.53	3.56
Revenue parameters					
Tariff Increase	%	0.00%	8.45%	8.45%	8.45%
Average Billing Rate	Rs /kWh	5.32	5.76	6.24	6.76
Expense					
Employee Cost Escalation	%	10%	10%	10%	10%
Administrative & General Escalation	%	6%	6%	6%	6%

Table 44: Financial position for Scenario D

Particulars	FY 16	FY 17	FY 18	FY 19
Income				
Sales Turnover	₹ 24,790.11	₹ 30,080.04	₹ 36,314.04	₹ 44,072.12
Net Sales	₹ 24,790.11	₹ 30,080.04	₹ 36,314.04	₹ 44,072.12
Other Income	₹ 663.32	₹ 696.48	₹ 731.31	₹ 767.87
Sale of surplus power	₹ 4,495.88	₹ 5,784.17	₹ 4,988.13	₹ 5,322.19
Total Income	₹ 29,949.30	₹ 36,560.69	₹ 42,033.47	₹ 50,162.18
Expenditure				
Transmission Charges	₹ 2,560.62	₹ 2,802.02	₹ 3,046.88	₹ 3,327.52
Power & Fuel Cost	₹ 26,174.28	₹ 30,550.23	₹ 32,049.69	₹ 35,117.42
Employee Cost	₹ 2,623.94	₹ 2,886.33	₹ 3,174.96	₹ 3,492.46
R&M cost	₹ 225.94	₹ 264.06	₹ 318.01	₹ 371.62
Administrative & General Expenses	₹ 384.55	₹ 407.63	₹ 432.11	₹ 458.05

Particulars	FY 16	FY 17	FY 18	FY 19
Miscellaneous Expenses	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Total Expenses	₹ 31,969.33	₹ 36,910.27	₹ 39,021.65	₹ 42,767.06
Operating Profit	-₹ 2,020.02	-₹ 349.57	₹ 3,011.82	₹ 7,395.12
PBDIT	-₹ 2,020.02	-₹ 349.57	₹ 3,011.82	₹ 7,395.12
Interest	₹ 1,508.00	₹ 2,406.95	₹ 5,516.74	₹ 5,660.15
PBDT	-₹ 3,528.03	-₹ 2,756.52	-₹ 2,504.92	₹ 1,734.97
Depreciation	₹ 744.30	₹ 913.06	₹ 1,115.30	₹ 1,289.19
Exceptional Items	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Profit Before Tax	-₹ 4,272.33	-₹ 3,669.58	-₹ 3,620.22	₹ 445.78
Provision	₹ 247.90	₹ 300.80	₹ 363.14	₹ 440.72
PBT (Post Extra-ord Items)	-₹ 4,520.23	-₹ 3,970.38	-₹ 3,983.36	₹ 5.06
Reported Net Profit	-₹ 4,520.23	-₹ 3,970.38	-₹ 3,983.36	₹ 5.06
Accumulated Losses	-₹ 33,297.81	-₹ 37,268.19	-₹ 41,251.56	-₹ 41,246.49

Based on the above assumptions, it is evident that if state adheres to the target electrification and reduction of losses, and funds the entire capital expenditure proposed under IPDS and DDUGJY through loans from FI/World Bank etc. and state govt. equity, **it has to still depend on the high tariff hike to the tune of 8.45% in FY 17 to FY 19** so that it can start earning overall profit from FY 19 onwards. Accumulated losses at end of FY 19 will still be at level of Rs. 41,246 Crores.

SCENARIO E: NON ADHERANCE TO LOSS REDUCTION TRAJECTORY (HIGHER LOSS REDUCTION TRAJECTORY) AND SUBSEQUENT DEPENDENCE ON HIGHER TARIFF HIKE

ASSUMPTIONS

- ✓ Around 1% higher AT&C losses than the targeted trajectory.
- ✓ Higher Tariff Hike of 8.53% each year from FY 17 to FY 19 on latest category-wise average billing rates approved by the Commission for FY 16.

Table 45: Assumptions for Scenario E

Year	Units	FY 16	FY 17	FY 18	FY 19
Energy Related Assumptions					
Energy Requirement (At State Periphery)	MU	63,164	69,069	75,026	81,833
Sales	MU	46,558	52,252	58,217	65,208
AT&C losses	%	24.15%	22.15%	20.15%	18.00%
Distribution Losses	%	24.15%	22.15%	20.15%	18.00%
Transmission Losses	%	2.82%	2.82%	2.82%	2.82%
Collection Efficiency	%	100.00%	100.00%	100.00%	100.00%
Power purchase	MU	77,328	87,473	90,725	98,587
Sale of Surplus Power	MU	14,164	18,404	15,699	16,754
Power purchase cost	Rs /kWh	3.38	3.49	3.53	3.56
Revenue parameters					
Tariff Increase	%	0.00%	8.53%	8.53%	8.53%
Average Billing Rate	Rs /kWh	5.32	5.76	6.25	6.77
Expense					
Employee Cost Escalation	%	10%	10%	10%	10%
Administrative & General Escalation	%	6%	6%	6%	6%

Table 46: Financial position for Scenario E

Particulars	FY 16	FY 17	FY 18	FY 19
Income				
Sales Turnover	₹ 24,790.11	₹ 30,102.23	₹ 36,367.63	₹ 44,169.72
Net Sales	₹ 24,790.11	₹ 30,102.23	₹ 36,367.63	₹ 44,169.72
Other Income	₹ 663.32	₹ 696.48	₹ 731.31	₹ 767.87
Sale of surplus power	₹ 4,249.20	₹ 5,521.27	₹ 4,709.62	₹ 5,026.29
Total Income	₹ 29,702.62	₹ 36,319.98	₹ 41,808.56	₹ 49,963.88
Expenditure				
Transmission Charges	₹ 2,594.37	₹ 2,838.00	₹ 3,085.02	₹ 3,368.08
Power & Fuel Cost	₹ 26,174.28	₹ 30,550.23	₹ 32,049.69	₹ 35,117.42
Employee Cost	₹ 2,623.94	₹ 2,886.33	₹ 3,174.96	₹ 3,492.46
R&M cost	₹ 225.94	₹ 259.86	₹ 301.27	₹ 339.95
Administrative & General Expenses	₹ 384.55	₹ 407.63	₹ 432.11	₹ 458.05
Miscellaneous Expenses	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Total Expenses	₹ 32,003.07	₹ 36,942.05	₹ 39,043.06	₹ 42,775.95
Operating Profit	-₹ 2,300.45	-₹ 622.07	₹ 2,765.51	₹ 7,187.93

Particulars	FY 16	FY 17	FY 18	FY 19
PBDIT	-₹ 2,300.45	-₹ 622.07	₹ 2,765.51	₹ 7,187.93
Interest	₹ 1,538.87	₹ 2,425.42	₹ 5,476.88	₹ 5,568.12
PBDT	-₹ 3,839.31	-₹ 3,047.49	-₹ 2,711.37	₹ 1,619.81
Depreciation	₹ 737.03	₹ 876.22	₹ 1,028.80	₹ 1,162.97
Exceptional Items	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
Profit Before Tax	-₹ 4,576.34	-₹ 3,923.71	-₹ 3,740.17	₹ 456.83
Provision	₹ 247.90	₹ 301.02	₹ 363.68	₹ 441.70
PBT (Post Extra-ord Items)	-₹ 4,824.24	-₹ 4,224.73	-₹ 4,103.85	₹ 15.14
Reported Net Profit	-₹ 4,824.24	-₹ 4,224.73	-₹ 4,103.85	₹ 15.14
Accumulated Losses	-₹ 33,601.82	-₹ 37,826.55	-₹ 41,930.40	-₹ 41,915.26

Based on the above assumptions, it is evident that if state unable to achieve target AT&C distribution losses (by 1%), then **it has to depend on the tariff hike of around 8.53% for FY 17 to FY 19** so that it can start earning overall profit from FY 19 onwards. Accumulated losses at end of FY 19 will still be at level of Rs. 41,915 Crores

CHAPTER 11: OTHER INITIATIVES

COMMUNICATION

Successful implementation of 24x7 Power for all 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 MPPMCL for looking at activities of overall communication strategy.

The financial situation in Madhya Pradesh makes it imperative to raise tariffs while other initiatives including 24x7 power for all are implemented. Such tariff increase would inevitably impact consumers and meet with resistance. To address this, the utilities should clearly communicate their plans on implementing the scheme along with the other reliability and efficiency improvement measures that they are implementing. A high level of involvement of the Government of Madhya Pradesh will also be required:

Table 47: Proposed Communication Responsibilities

Communication Objective	Responsibility	Frequency
"Power for All" - Roll Out Plan	Secretary, Energy & Joint Secretary (MOP)	Quarterly
Status update on Deliverables	Secretary, Energy	Quarterly
Generation Projects <i>Physical Progress, Achievements and Other Relates Issues</i>	Managing Director, Genco	Quarterly
Inter-State Transmission Projects	Director (Projects), PGCIL	Monthly

Communication Objective	Responsibility	Frequency
<i>Physical Progress, Achievements and Other Relates Issues</i>		
Intra-State Transmission Projects <i>Physical Progress, Achievements and Other Relates Issues</i>	Managing Director, MPPTCL	Monthly
Distribution <i>Progress, Achievements, Losses, Consumer Initiatives etc.</i>	Managing Director, DISCOMS	Monthly
Renewable Power	Deputy Commissioner, MPREDA & Joint Secretary (MNRE)	Quarterly

INFORMATION TECHNOLOGY

Need to adopt IT in every sphere of utility operation is self-evident. 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.

- ✓ Power procurement planning and optimization tools will be implemented to reduce the power procurement costs and improve supply reliability. This will 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.

- ✓ Implementation of Enterprise Resource Planning Systems (ERP) which would cover critical aspects like Finance and Accounts, Asset Management, Inventory Management, Human Resource Management, Project Management, Personnel Information System (PIS). ERP will help in timely capitalization of asset, deriving better business value of investment etc.
- ✓ In order to curb the malpractices being done at the level of meter readers while entering the meter reading of the consumers, various schemes may be adopted.
- ✓ Centralized Information & Monitoring System for operational, enforcement & litigation, vigilance activities and analysis have to be operationalized.
- ✓ Power management would require 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 very useful for improving reliability and reduction of network downtime.
- ✓ Requirement of Regional Distribution Control Centres (RDCC) within the State will be identified in view of upcoming projected load. 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 power supply, but also thereafter for other functions like load forecasting.
- ✓ 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 Electricity Act 2003 will be monitored. The utilities shall use IT tools to gather the information with regard to service standards with minimal manual intervention.
- ✓ The above measures, need to be implemented on priority basis by distribution companies and also 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 undertaken 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 Government - where necessary. The committee may be constituted with the following members – PFC, REC, CEA, SECI, EESL, BEE, Ministry of Power, MoEF, and MNRE.
- **State Government Level Committee:** It is proposed that a State level committee headed by the Secretary (Power) 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.

- **Department Level Committee:** It is proposed that a Department level committee headed by the Nodal Officer will be formed which shall undertake steps required to ensure that the projects are progressing as per the action plan. This committee will undertake progress reviews on a monthly basis.
- **District Level Committee** – It is proposed to constitute a district level committee headed by the Superintendent Engineer (S.E.) to take action that is necessary to ensure that the projects are completed in a timely manner and address any issues pertaining to land or other relevant approvals.
- **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 facilitate in tracking the action taken / to be taken 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 applications in the Transmission & Distribution system and to meet the expectations of 24x7 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 and keeping abreast with latest technological developments. The capacity building may also include consumer grievance redressal system, awareness regarding importance of working with safety, outage management system, demand side management etc. It is also imperative that for transforming the distribution utility into a customer friendly one, change of mind-set of the employees would be required. It is critical that Change Management initiatives are rolled out and institutionalized for achieving better results.

In view of the importance of training on new technologies, there is a requirement for development and implementation of a well-structured Human Resource Training Programme to help realize the dream of 24x7 power supply system in the State in its true sense.

There is already a provision for Demand Side Management (DSM) training under various programmes of Bureau of energy Efficiency (BEE) and the same should be implemented to achieve the goal of 24 x 7 power. The training for the class C & D employees is also being provided under RAPDRP Part C scheme.

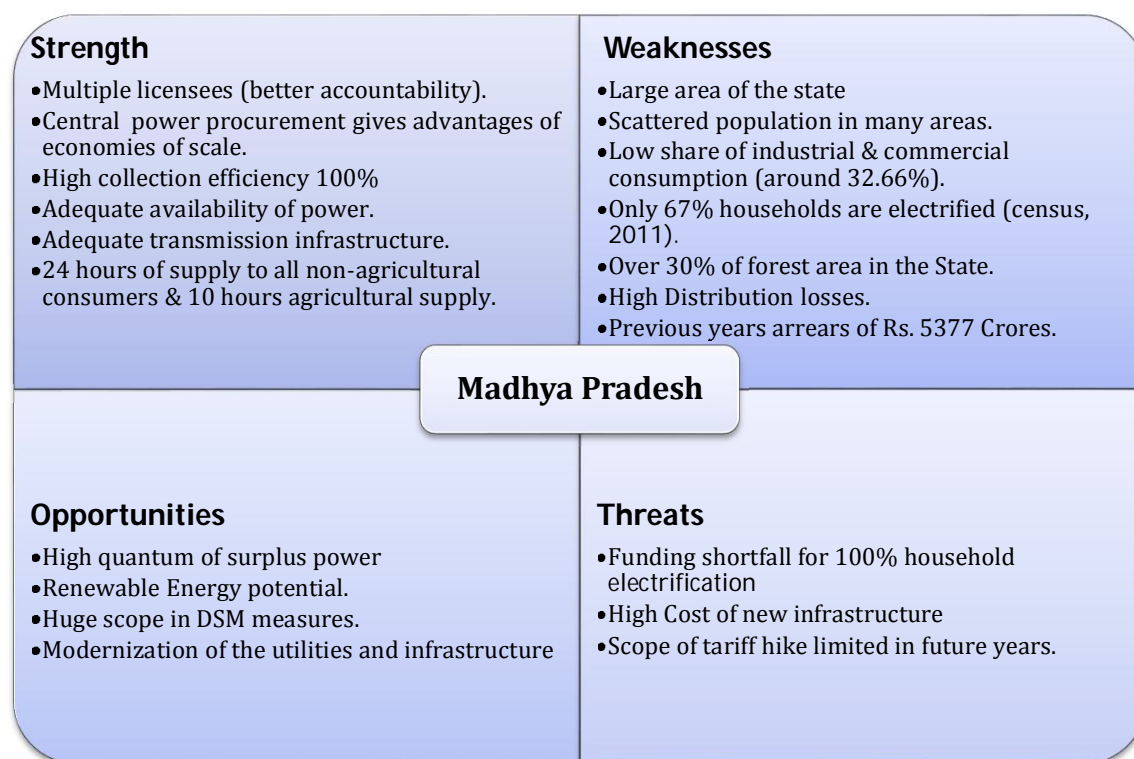
A State level officers training institute may be required to be opened in the State to fulfil the ongoing training requirement for employees of MP Power Utilities. This also helps in training of subordinate technical staff. Following training programmes are proposed to be implemented for the utility:

- ✓ Two weeks trainings for technical staff including officers & engineers once in every two years.
- ✓ One week training for non-technical officers every two years.
- ✓ One week training for subordinate technical staff at each district headquarters every year.

CHAPTER 12: YEAR WISE ROLL OUT PLAN

SWOT ANALYSIS

In the above sections we have discussed in detail the existing status and its future needs. We have also provided some actionable targets which will help Madhya Pradesh in achieving the set goal. Before structuring the above targets, Strength, Weakness, Opportunities and Threats (SWOT) analysis of existing power sector in Madhya Pradesh has been discussed. The exercise has been done to bring out some of the key risk indicators which affect the overall market in Madhya Pradesh along with advantages present.



From the above analysis it is quite evident that most of the threats are external factors which would need continuous efforts from the State to mitigate them as soon as possible. Further, from the weaknesses tabulated it is seen that, with some strong and bold measures State will be able to attain the target.

Based on above observations, a road map for Madhya Pradesh has been developed to mitigate the above weaknesses and threats.

ROLL OUT PLAN FOR 24 X 7 POWER FOR ALL

Year wise roll out plan for the State is summarized in the following table:

Table 48: Year-wise roll out plan

Sl. No.	Category	Base year scenario (FY 15)	FY 16	FY 17	FY 18	FY 19	Total	Total expected capacity FY 19
GENERATION								
A	Availability (MW):							
	State Sector							
1	MP Genco Thermal	4320.00	0.00	0.00	0.00	1188.00	1188.00	5508.00
2	MP Genco Hydel	917.17	0.00	0.00	0.00	0.00	0.00	917.17
3	JV Hydel & Other Hydel	2426.50	0.00	0.00	0.00	0.00	0.00	2426.50
4	Private Generating Stations	1290.75	630.00	0.00	0.00	0.00	630.00	1920.75
5	Central Generating Stations	5215.65	0.00	334.00	1119.00	66.00	1519.00	6734.65
6	Renewable Energy Sources	1020.16	2747.00	2120.00	0.00	0.00	4867.00	5887.16
	Total Availability (MW)	15190.23	3377.00	2454.00	1119.00	1254.00	8204.00	23394.23
B	Peak Demand (MW):							
1	Peak Demand (MW)	9598	10314	10964	11748	12643		12643
TRANSMISSION								
C	Transmission Lines (CKM)							
1	400 KV	3074	0	49	190	1840	2079	5153
2	220 KV	11801	400	867	780	1085	3132	14933
3	132 KV	15259	789	1892	2953	781	6415	21674
	Total Transmission Line	30134	1189	2808	3923	3706	11626	41760
D	Transformation Capacity (MVA):							
1	400 KV	6720	630	1460	0	3150	5240	11960
2	220 KV	18470	2280	2660	3040	160	8140	26610
3	132 KV	20247	1917	1373	2147	3119	8556	28803
	Total Transformation Capacity	45437	4827	5493	5187	6429	21936	67373
DISTRIBUTION								
E	Connecting the Unconnected							
1	Target Electrification – Rural	7469062	514198	1028396	1542595	2056793	5141982	12611044
2	Target Electrification – Urban	4246309	14422	28844	43267	57689	144222	4390531
3	Total	11715371	528620	1057241	1585861	2114482	5286204	17001575
F	Efficiency Improvement							
1	Distribution Losses							
	West	22.27%	22.38%	20.40%	18.41%	16.27%		16.27%
	Central	25.30%	25.41%	23.43%	21.44%	19.30%		19.30%
	East	21.59%	21.70%	19.72%	17.73%	15.59%		15.59%
	Total	23.07%	23.15%	21.15%	19.15%	17.00%		17.00%
2	AT&C Losses							
	West	22.27%	22.38%	20.40%	18.41%	16.27%		16.27%
	Central	25.30%	25.41%	23.43%	21.44%	19.30%		19.30%
	East	21.59%	21.70%	19.72%	17.73%	15.59%		15.59%
	Total	23.07%	23.15%	21.15%	19.15%	17.00%		17.00%
G	Capacity Addition/Augmentation							
	West							
1	33 kV Substation (MVA Capacity)	9192	161	540	472	382	1554	10746

Sl. No.	Category	Base year scenario (FY 15)	FY 16	FY 17	FY 18	FY 19	Total	Total expected capacity FY 19
2	Length of 33 kV lines (Ckt Kms)	14396	578	584	445	357	1964	16360
3	Length of 11 kV lines (Ckt Kms)	113330	4180	11635	6020	3402	25237	138567
4	Length of LT Lines (km)	150172	2700	5887	4756	3247	16590	166762
5	Capacity of 11/0.4 kV Distribution Transformers (MVA)	11675	630	1425	1357	1193	4605	16280
	Central							
1	33 kV Substation (MVA Capacity)	8497	715	747	720	544	2726	11223
2	Length of 33 kV lines (Ckt Kms)	14703	1112	1196	548	771	3627	18330
3	Length of 11 kV lines (Ckt Kms)	100845	5300	9335	8340	5954	28929	129774
4	Length of LT Lines (km)	109537	4268	7420	8155	3511	23354	132891
5	Capacity of 11/0.4 kV Distribution Transformers (MVA)	11175	1095	2172	1625	836	5728	16903
	East							
1	33 kV Substation (MVA Capacity)	7493	250	1396	566	585	2797	10290
2	Length of 33 kV lines (Ckt Kms)	16815	410	1336	530	520	2796	19611
3	Length of 11 kV lines (Ckt Kms)	98893	7845	12066	15931	10771	46613	145506
4	Length of LT Lines (km)	145681	2865	11236	5150	1901	21152	166833
5	Capacity of 11/0.4 kV Distribution Transformers (MVA)	7503	281	833	504	404	2022	9525

CHAPTER 13: FUND REQUIREMENT

The fund requirement for various schemes (ongoing and proposed) for Generation, Transmission, Distribution and Renewable energy plan as discussed in previous chapters is tabulated below:

Table 49: Fund Requirement

S No.	Particulars	Fund Requirement (In Rs Crores)				
		FY 16	FY 17	FY 18	FY 19	Total
GENERATION						
A	Completed Projects					
1	2X600 MW Shree Singaji (Malwa) T.P.P.	470	9	0	0	479
2	2X250 MW Sarni S. T.P.S. Extn. Unit 10 & 11	389	0	0	0	389
B	Ongoing Projects					0
1	2 X 660 MW Shri Singaji Thermal Power Project (Phase - II)	830	1300	1500	1300	4930
C	New Projects					0
1	1 X 250 MW Amarkantak T.P.S. Extn.	0	0	200	300	500
2	1 X 660 MW Sarni T.P.S. Extn.	0	0	300	1000	1300
3	2 X 45 MW Kanhan HEP (Kamthikhurd , Chhindwara)			54	144	198
4	1 X 500/660 MW S.G. T.P.S. Extn.		0			0
D	Other Schemes					0
1	R&M works of old Thermal Power Stations	140	192	0	0	332
2	Development of Coal Block for Singhaji PH-II & Satpura TPS Extn Unit 6 (1x660 MW)	240	200	0	0	440
	TOTAL (MP GENCO PROJECTS) (A+B+C+D)	2069	1702	2054	2744	8569
TRANSMISSION						
A	EHV Transmission Lines					
1	400 KV	58	27	392	389	866
2	220 KV	155	477	414	668	1714
3	132 KV	429	343	932	540	2244
	SUB-TOTAL (LINES)	642	847	1738	1597	4824
B	EHV Sub-stations					
1	400 KV	171	296	206	195	868
2	220 KV	371	423	226	492	1512
3	132 KV	246	279	514	538	1577
	SUB-TOTAL (S/S)	788	998	946	1225	3957
C	Other EHV works	67	333	130	168	698
	Total MP Transco Projects	1497	2178	2814	2990	9479
DISTRIBUTION						
GoMP Schemes						
1	Strengthening of Sub-Transmission & Distribution System (GoMP)	1032	880	919	1109	3941

S No.	Particulars	Fund Requirement (In Rs Crores)				
		FY 16	FY 17	FY 18	FY 19	Total
2	New Agricultural Pumps	422	508	572	525	2027
EAP Schemes						
3	Feeder Separation Scheme	607	443	591	0	1641
4	Strengthening of Sub-Transmission & Distribution System	205	34	3	3	246
5	Renovation of 33/11kv Sub-Stations & DTR metering	220	271	0	0	491
GoI Schemes						
6	RAPDRP	347	188	5	5	545
7	RGGVY	307	600	543	449	1899
8	DDUGVY	597	1108	1161	0	2865
9	IPDS	322	789	398	0	1509
Other Schemes						
10	Others	0	0	0	0	0
	Total	4059	4821	4193	2091	15164

ANNEXURES

ANNEXURE – 1

Table 50: District wise Households and their Electrification Status ⁵

Area Name	Rural/ Urban	Electrified	Number of households	Electrification
Alirajpur	Rural	71095	121337	59%
	Urban	9911	10410	95%
Anuppur	Rural	44567	126225	35%
	Urban	36771	42594	86%
Ashoknagar	Rural	60226	141801	42%
	Urban	24494	28903	85%
Balaghat	Rural	230378	341221	68%
	Urban	47549	53089	90%
Barwani	Rural	146726	205589	71%
	Urban	34413	37472	92%
Betul	Rural	168945	260878	65%
	Urban	62029	66196	94%
Bhind	Rural	51778	227645	23%
	Urban	56041	70611	79%
Bhopal	Rural	68041	91084	75%
	Urban	384871	396666	97%
Burhanpur	Rural	67306	96440	70%
	Urban	45114	47714	95%
Chhatarpur	Rural	117229	299608	39%
	Urban	58827	71277	83%
Chhindwara	Rural	245850	330846	74%
	Urban	99025	107543	92%
Damoh	Rural	142620	250346	57%
	Urban	45111	50769	89%
Datia	Rural	68053	126467	54%
	Urban	29643	33069	90%
Dewas	Rural	189027	220809	86%
	Urban	81430	83933	97%
Dhar	Rural	273348	339844	80%
	Urban	76291	79969	95%
Dindori	Rural	56322	161808	35%
	Urban	6050	7191	84%
East Nimar	Rural	156945	216711	72%
	Urban	45765	48946	94%
Guna	Rural	93931	183767	51%
	Urban	50317	57666	87%
Gwalior	Rural	88553	144130	61%
	Urban	218306	225375	97%
Harda	Rural	73645	88422	83%
	Urban	21421	22559	95%
Hoshangabad	Rural	124038	174226	71%
	Urban	74038	78336	95%
Indore	Rural	140133	153259	91%
	Urban	453443	462075	98%
Jabalpur	Rural	186984	236023	79%

⁵ As per the information available in <http://censusindia.gov.in/>

Area Name	Rural/ Urban	Electrified	Number of households	Electrification
	Urban	265039	279006	95%
Jhabua	Rural	109003	190362	57%
	Urban	16408	17259	95%
Katni	Rural	123083	234239	53%
	Urban	49333	54787	90%
Mandla	Rural	118481	220889	54%
	Urban	25322	28298	89%
Mandsaur	Rural	186564	229006	81%
	Urban	53321	55405	96%
Morena	Rural	63420	286015	22%
	Urban	68066	76294	89%
Narsimhapur	Rural	134408	204994	66%
	Urban	37736	42622	89%
Neemuch	Rural	101754	129968	78%
	Urban	43504	45698	95%
Panna	Rural	56944	209035	27%
	Urban	19153	24619	78%
Raisen	Rural	140270	214616	65%
	Urban	54103	59594	91%
Rajgarh	Rural	183211	289795	63%
	Urban	47919	52053	92%
Ratlam	Rural	135046	211063	64%
	Urban	78779	82053	96%
Rewa	Rural	190365	467403	41%
	Urban	60767	72970	83%
Sagar	Rural	246845	376804	66%
	Urban	119649	132551	90%
Satna	Rural	217651	390426	56%
	Urban	77051	88327	87%
Sehore	Rural	169834	206935	82%
	Urban	42304	44651	95%
Seoni	Rural	196185	277982	71%
	Urban	32510	35292	92%
Shahdol	Rural	75426	204690	37%
	Urban	37758	44093	86%
Shajapur	Rural	181240	243638	74%
	Urban	51495	54628	94%
Sheopur	Rural	56621	124647	45%
	Urban	18149	20101	90%
Shivpuri	Rural	99207	303041	33%
	Urban	48921	53321	92%
Sidhi	Rural	86554	220630	39%
	Urban	15674	17844	88%
Singrauli	Rural	39109	193734	20%
	Urban	33982	43452	78%
Tikamgarh	Rural	98575	253752	39%
	Urban	34150	45462	75%
Ujjain	Rural	181166	237288	76%
	Urban	142213	146990	97%
Umaria	Rural	49520	121448	41%
	Urban	18455	22981	80%
Vidisha	Rural	122472	231876	53%
	Urban	59038	65543	90%
West Nimar	Rural	250450	309603	81%
	Urban	53841	56975	94%

Table 51: Electrification status Rural and Urban

S.No.	District Name	Households		Electrification Status Rural		Electrification Status Urban	
		Rural	Urban	Electrified	Un-Electrified	Electrified	Un-Electrified
1	Alirajpur	91.48%	8.52%	58.60%	41.40%	95.20%	4.80%
2	Anuppur	74.36%	25.64%	35.30%	64.70%	86.30%	13.70%
3	Ashoknagar	82.73%	17.27%	42.50%	57.50%	84.70%	15.30%
4	Balaghat	86.14%	13.86%	67.50%	32.50%	89.60%	10.40%
5	Barwani	84.18%	15.82%	71.40%	28.60%	91.80%	8.20%
6	Betul	79.41%	20.59%	64.80%	35.20%	93.70%	6.30%
7	Bhind	75.78%	24.22%	22.70%	77.30%	79.40%	20.60%
8	Bhopal	18.72%	81.28%	74.70%	25.30%	97.00%	3.00%
9	Burhanpur	66.84%	33.16%	69.80%	30.20%	94.60%	5.40%
10	Chhatarpur	79.17%	20.83%	39.10%	60.90%	82.50%	17.50%
11	Chhindwara	75.16%	24.84%	74.30%	25.70%	92.10%	7.90%
12	Damoh	82.70%	17.30%	57.00%	43.00%	88.90%	11.10%
13	Datia	78.75%	21.25%	53.80%	46.20%	89.60%	10.40%
14	Dewas	71.69%	28.31%	85.60%	14.40%	97.00%	3.00%
15	Dhar	79.74%	20.26%	80.40%	19.60%	95.40%	4.60%
16	Dindori	95.64%	4.36%	34.80%	65.20%	84.10%	15.90%
17	Guna	75.72%	24.28%	51.10%	48.90%	87.30%	12.70%
18	Gwalior	37.69%	62.31%	61.40%	38.60%	96.90%	3.10%
19	Harda	79.18%	20.82%	83.30%	16.70%	95.00%	5.00%
20	Hoshangabad	68.31%	31.69%	71.20%	28.80%	94.50%	5.50%
21	Indore	24.50%	75.50%	91.40%	8.60%	98.10%	1.90%
22	Jabalpur	44.30%	55.70%	79.20%	20.80%	95.00%	5.00%
23	Jhabua	90.70%	9.30%	57.30%	42.70%	95.10%	4.90%
24	Katni	80.51%	19.49%	52.50%	47.50%	90.00%	10.00%
25	Khandwa (East Nimar)	81.18%	18.82%	72.40%	27.60%	93.50%	6.50%
26	Khargone (West Nimar)	84.10%	15.90%	80.90%	19.10%	94.50%	5.50%
27	Mandla	88.29%	11.71%	53.60%	46.40%	89.50%	10.50%
28	Mandsaur	80.38%	19.62%	81.50%	18.50%	96.20%	3.80%
29	Morena	78.48%	21.52%	22.20%	77.80%	89.20%	10.80%
30	Narsimhapur	82.43%	17.57%	65.60%	34.40%	88.50%	11.50%
31	Neemuch	73.30%	26.70%	78.30%	21.70%	95.20%	4.80%
32	Panna	89.02%	10.98%	27.20%	72.80%	77.80%	22.20%
33	Raisen	77.47%	22.53%	65.40%	34.60%	90.80%	9.20%
34	Rajgarh	84.62%	15.38%	63.20%	36.80%	92.10%	7.90%
	Ratlam	71.60%	28.40%	64.00%	36.00%	96.00%	4.00%
36	Rewa	85.67%	14.33%	40.70%	59.30%	83.30%	16.70%
37	Sagar	73.29%	26.71%	65.50%	34.50%	90.30%	9.70%
38	Satna	80.70%	19.30%	55.70%	44.30%	87.20%	12.80%
39	Sehore	81.81%	18.19%	82.10%	17.90%	94.70%	5.30%
40	Seoni	88.43%	11.57%	70.60%	29.40%	92.10%	7.90%
41	Shahdol	81.62%	18.38%	36.80%	63.20%	85.60%	14.40%
42	Shajapur	81.46%	18.54%	74.40%	25.60%	94.30%	5.70%
43	Sheopur	86.00%	14.00%	45.40%	54.60%	90.30%	9.70%
44	Shivpuri	84.59%	15.41%	32.70%	67.30%	91.70%	8.30%
45	Sidhi	92.31%	7.69%	39.20%	60.80%	87.80%	12.20%
46	Singrauli	81.21%	18.79%	20.20%	79.80%	78.20%	21.80%
47	Tikamgarh	84.40%	15.60%	38.80%	61.20%	75.10%	24.90%

S.No.	District Name	Households		Electrification Status Rural		Electrification Status Urban	
		Rural	Urban	Electrified	Un-Electrified	Electrified	Un-Electrified
48	Ujjain	61.21%	38.79%	76.30%	23.70%	96.80%	3.20%
49	Umaria	83.69%	16.31%	40.80%	59.20%	80.30%	19.70%
50	Vidisha	77.52%	22.48%	52.80%	47.20%	90.10%	9.90%
	Total	73.51%	26.49%	58.30%	41.70%	92.70%	7.30%

Table 52: Projected Sales from Existing and Newly Electrified Households (West Zone)

S.N.	Particulars	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
A	Rural - Electrified Households (Existing + Projected Growth)					
	Electrified Households Rural (in Nos.)	24,68,146	25,46,885	26,28,136	27,11,979	27,98,496
	Actual Metered Sales (in MU)	1390				
	Actual Daily Household Consumption	1.54				
	Projected Daily Household Consumption		1.74	1.96	2.20	2.48
	Projected Annual Consumption		1,590	1,848	2,147	2,496
B	Rural - Electrification of Un-Electrified Households					
	Targeted Annual Addition Rural (in Nos.)		64,959	1,29,918	1,94,877	2,59,836
	Cumulative Annual Addition (In Nos.)		64,959	1,94,877	3,89,754	6,49,590
	Projected Annual Consumption		21	93	235	471
C=A+B	Total Projected Rural Consumption (MU)		1,611	1,941	2,382	2,966
D	Urban - Electrified Households (Existing + Projected Growth)					
	Electrified Households Urban (in Nos.)	13,79,087	14,23,797	14,69,956	15,17,611	15,66,812
	Actual Metered Sales (in MU)	2098				
	Actual Daily Household Consumption	4.17				
	Projected Daily Household Consumption		4.37	4.57	4.79	5.02
	Projected Annual Consumption		2,233	2,415	2,611	2,824
	Urban - Electrification of Un-Electrified Households					
	Targeted Annual Addition urban (in Nos.)		325	650	975	1,300
	Cumulative Annual Addition (In Nos.)		325	975	1,949	3,249
	Projected Annual Consumption		0	1	3	5
E	Total Projected Urban Consumption (In MU)		2,234	2,416	2,614	2,829
F=C+E	Total Projected Domestic Urban Consumption (In MU)		3,844	4,357	4,996	5,795

Table 53: Projected Sales from Existing and Newly Electrified Households (Central Zone)

S.N.	Particulars	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
A	Rural - Electrified Households (Existing + Projected Growth)					
	Electrified Households Rural (in Nos.)	18,63,745	19,23,202	19,84,556	20,47,868	21,13,199
	Actual Metered Sales (in MU)	1031				
	Actual Daily Household Consumption	1.52				
	Projected Daily Household Consumption		1.70	1.91	2.15	2.41
	Projected Annual Consumption		1,176	1,364	1,581	1,832
B	Rural - Electrification of Un-Electrified Households					
	Targeted Annual Addition Rural (in Nos.)		1,82,189	3,64,378	5,46,567	7,28,756
	Cumulative Annual Addition (In Nos.)		1,82,189	5,46,567	10,93,133	18,21,889
	Projected Annual Consumption		57	254	643	1,283
C=A+B	Total Projected Rural Consumption (MU)		1,233	1,618	2,223	3,115
D	Urban - Electrified Households (Existing + Projected Growth)					
	Electrified Households Urban (in Nos.)	15,51,991	16,02,306	16,54,252	17,07,883	17,63,252
	Actual Metered Sales (in MU)	2312				
	Actual Daily Household Consumption	4.08				
	Projected Daily Household Consumption		4.25	4.42	4.60	4.78
	Projected Annual Consumption		2,444	2,625	2,820	3,029
	Urban - Electrification of Un-Electrified Households					
	Targeted Annual Addition urban (in Nos.)		1,927	3,855	5,782	7,710
	Cumulative Annual Addition (In Nos.)		1,927	5,782	11,565	19,274
	Projected Annual Consumption		1	6	15	27
E	Total Projected Urban Consumption (In MU)		2,446	2,632	2,835	3,056
F=C+E	Total Projected Domestic Urban Consumption (In MU)		3,679	4,250	5,058	6,171

Table 54: Projected Sales from Existing and Newly Electrified Households (East Zone)

S.N.	Particulars	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
A	Rural - Electrified Households (Existing + Projected Growth)					
	Electrified Households Rural (in Nos.)	31,37,171	32,37,253	33,40,528	34,47,098	35,57,067
	Actual Metered Sales (in MU)	1598				
	Actual Daily Household Consumption	1.40				
	Projected Daily Household Consumption		1.60	1.83	2.09	2.39
	Projected Annual Consumption		1,858	2,194	2,592	3,061
B	Rural - Electrification of Un-Electrified Households					
	Targeted Annual Addition Rural (in Nos.)		2,67,050	5,34,101	8,01,151	10,68,201
	Cumulative Annual Addition (In Nos.)		2,67,050	8,01,151	16,02,302	26,70,503
	Projected Annual Consumption		78	356	918	1,867
C=A+B	Total Projected Rural Consumption (MU)		1,936	2,551	3,510	4,929
D	Urban - Electrified Households (Existing + Projected Growth)					
	Electrified Households Urban (in Nos.)	13,15,231	13,57,870	14,01,892	14,47,341	14,94,263
	Actual Metered Sales (in MU)	1786				
	Actual Daily Household Consumption	3.72				
	Projected Daily Household Consumption		3.86	4.00	4.15	4.30
	Projected Annual Consumption		1,882	2,014	2,155	2,307
	Urban - Electrification of Un-Electrified Households					
	Targeted Annual Addition urban (in Nos.)		12,170	24,340	36,510	48,680
	Cumulative Annual Addition (In Nos.)		12,170	36,510	73,019	1,21,699
	Projected Annual Consumption		9	36	83	153
E	Total Projected Urban Consumption (In MU)		1,890	2,050	2,238	2,460
F=C+E	Total Projected Domestic Urban Consumption (In MU)		3,826	4,600	5,748	7,388

Table 55: Firm entitlement in FY 15 (in MW)

Name of Plant		Type	Firm Entitlement (MP share)
			MW
MP Genco Thermal	Amarkantak TPS Ph-II	Thermal	240
	Amarkantak TPS Ph-III	Thermal	210
	Satpura TPS Ph-II & III	Thermal	830
	Satpura TPS Ph-IV	Thermal	500
	SGTPS Ph-I & II	Thermal	840
	SGTPS Ph-III	Thermal	500
	Shri Singaji STPS, Ph-I	Thermal	1200
	Total (MP Genco Thermal-MP Share)		4320
MP Genco	Rani Awanti Bai Sagar, Bargi HPS	Hydel	90
	Bansagar Ph I HPS (Tons)	Hydel	315
	Bansagar Ph-II HPS (Silpara)	Hydel	30

Name of Plant		Type	Firm Entitlement (MP share)
			MW
	Bansagar Ph-III HPS (Deolond)	Hydel	60
	Bansagar Ph-IV HPS (Jhinna)	Hydel	20
	Birsinghpur HPS	Hydel	20
	Madikheda HPS	Hydel	60
	Rajghat HPS	Hydel	23
	Gandhisagar HPS	Hydel	58
	Ranapratap Sagar HPS	Hydel	86
	Jawahar Sagar HPS	Hydel	50
	Pench HPS	Hydel	107
	Total (MP Genco Hydel)		917.17
JV Hydel & Other Hydel	NHDC Indira Sagar HPS	Hydel	1000
	NHDC Omkareshwar HPS	Hydel	520
	NVDA Sardar Sarovar HPS	Hydel	827
	NVDA Indira sagar LBC HPS	Hydel	15
	NVDA Bargi LBC HPS	Hydel	10
	Rihand HPS	Hydel	45
	Matatila HPS	Hydel	10
	Total (JV Hydel & Other Hydel)		2426.5
NTPC (WR)	Vindhyanchal STPS-I	Coal	443
	Vindhyanchal STPS-II	Coal	318
	Vindhyanchal STPS-III	Coal	245
	Vindhyanchal STPS-IV	Coal	284
	Korba STPS	Coal	481
	Korba STPS Unit 7	Coal	76
	Sipat STPS Stage-I	Coal	337
	Sipat STPS Stage-II	Coal	187
	Mouda STPS Stage-1	Coal	184
	Kawas GPP	Coal	140
	Gandhar GPP	Gas	117
	Kahalgaon STPS Stage - II / ER	Coal	74
	Kakrapar APS	Nuclear	114
	Tarapore APS	Nuclear	231
	DVC Mejia & Chandrapur TPS	Coal	400
	DVC Durgapur TPS	Coal	100
	Total (CGS)		3730.65
IPPs	Torrent Power	Gas	100
	BLA Power, Unit-1	Coal	16
	Jaypee Bina Power	Coal	350
	Lanco Amarkantak	Coal	300
	Essar Power STPS	Coal	30
	Reliance UMPP, Sasan	Coal	1485
	Jaiprakash Power STPS, Nigri	Coal	495
	Total (IPPs)		2776
Renewable Sources	Solar	Solar	305
	Wind	Wind	685
	Bio Mass/Bio gas	Bio Mass	24
	Other Small Hydro	Hydro	5
	Total (Renewable Energy)		1020
Grand Total			15190

ANNEXURE – 2

MNRE Schemes/options for electrification of remote households

SCHEMES FOR INDIVIDUAL HOUSEHOLDS

OPTION I	
System Proposed	100 Wp Solar system
Solar PV Module	100 Wp
Battery Storage (Tubular type)	12V, 75 AH
Estimated Project Cost	Rs. 25,000/

The above system is adequate to meet consumer demand with autonomy for two (2) non-sunshine days for consumption profile of estimated 0.3 units per day considering following inclusions in the scheme:

Inclusions	Nos.	Unit Load (W) [DC]	Total Load (W)	Hours of use per day	Energy Consumption (kWh/day)
D.C. operated LED Lights	3	8	24	4	0.096
D.C. operated LED Lights	2	5	10	4	0.040
D.C. Fan	1	12	12	10	0.120
D.C. B&W TV	1	12	12	4	0.048
Mobile Charger	1	5	5	3	0.015
Total					0.319

OPTION II	
System Proposed	200 Wp Solar system
Solar PV Module	200 Wp
Battery Storage (Tubular type)	12V, 75 AH
Estimated Project Cost	Rs. 50,000/

The above system is adequate to meet consumer demand with autonomy for two (2) non-sunshine days for consumption profile of estimated 0.6 units per day considering following inclusions in the scheme:

Inclusions	Nos.	Unit Load (W) [DC]	Total Load (W)	Hours of use per day	Energy Consumption (kWh/day)
D.C. operated LED Lights	3	8	24	6	0.144
D.C. operated LED Lights	2	5	10	6	0.060
D.C. Fan (1*24W or 2*12W)	2	12	24	12	0.288
D.C. Color TV	1	30	30	4	0.120
Mobile Charger	1	5	5	3	0.015
Total					0.627

SCHEMES FOR VILLAGE WITH A CLUSTER OF “HOUSEHOLDS” – OFF GRID

OPTION III	
Target Cluster of Households	15
Total Load (500 Whrs/ Household)	7500 Whrs
System Proposed	Solar PV Mini Grid And Central Control Room
Solar PV Panel	2.5 KWp
Battery Storage	48V, 600AH
Off Grid PCU (Inverter and Charge controller)	48 V, 2.5 KW
Other balance of System Components	As per actual
Estimated Project Cost	Rs. 7,50,000/

Inclusions	Nos.	Unit Load (W) [DC]	Total Load (W)	Hours of use per day	Energy Consumption (kWh/day)
A.C. operated LED Lights	3	8	24	6	0.144
A.C. operated LED Lights	2	5	10	6	0.060
Power for A.C. Fan and or Power for A.C. Loads like Color TV, Set top/ PC and Mobile Charger etc.	1	50	50	6	0.300
Total					0.504

OPTION IV	
Target Cluster of Households	50
Total Load (700 Whrs/ Household)	35,000 Whrs
System Proposed	Solar PV Mini Grid And Central Control Room
Solar PV Panel	12.5 KWp
Battery Storage	240V, 600AH
Off Grid PCU (Inverter and Charge controller)	240V, 12.5 KW
Other balance of System Components	As per actual
Estimated Project Cost	Rs. 30,00,000/

Inclusions	Nos.	Unit Load (W) [DC]	Total Load (W)	Hours of use per day	Energy Consumption (kWh/day)
A.C. operated LED Lights	3	8	24	6	0.144
A.C. operated LED Lights	2	5	10	6	0.060
Power for A.C. Fan and or Power for A.C. Loads like Color TV, Set top/ PC and Mobile Charger etc.	1	50	50	10	0.500
Total					0.704

PROPOSED SCHEME:

- MNRE may provide subsidy at the rate of 40%. through NCEF A network of local technicians will have to be created for service and repair.
- Some local agencies / NGO's will have to be involved to ensure upkeep and proper use through awareness and training of users.
- The beneficiary may be asked to keep some fixed amount as “Reserves” like for battery replacement in future.

ANNEXURE - 3

Government Orders for promoting revenue collection for distribution companies.

महत्वपूर्ण
नगरपालिका निर्वाचन
स्पीड-पोस्ट

मध्य प्रदेश राज्य निर्वाचन आयोग
"निर्वाचन भवन"
58, अरेरा हिल्स, भोपाल (म0प्र0)-462 011

क्रमांक एफ-70-31/2014/तीन/न0पा0/1039

भोपाल, दिनांक 14/10/2014

प्रति,

1. प्रबंध संचालक,
म0प्र0 मध्य क्षेत्र विद्युत वितरण कम्पनी,
लिमिटेड भोपाल।
2. प्रबंध संचालक,
म0प्र0 पूर्व क्षेत्र विद्युत वितरण कम्पनी,
लिमिटेड जबलपुर।
3. प्रबंध संचालक,
म0प्र0 पश्चिम क्षेत्र विद्युत वितरण कम्पनी,
लिमिटेड इन्दौर।

OSD
[Signature]

विषय:-नगरीय निकायों के निर्वाचन हेतु नाम निर्देशन पत्रों की संवीक्षा।

संदर्भ:-आयोग का पत्र क्रमांक एफ-70-31/2014/तीन/न.पा./996 दिनांक 30 सितम्बर 2014

कृपया सन्दर्भित पत्र का अवलोकन करें।

1. नगरीय निकायों का निर्वाचन लड़ने वाले प्रत्येक अभ्यर्थी को नाम निर्देशन पत्र के साथ शपथ प्रस्तुत किये जाने तथा म0प्र0 नगरपालिका निगम अधिनियम 1956 की धारा 17 एवं म0प्र0 नगरपालिका अधिनियम 1961 की धारा 35 के प्रावधान के अन्तर्गत बिजली कम्पनियों को देय छह मास से अधिक कालावधि के लिये कोई शोध्य के भुगतान हेतु अदेय प्रमाण-पत्र प्रस्तुत किये जाने के निर्देश दिये गये हैं। इसी अनुक्रम में नगरीय निकाय के समस्त शोध्य करों के भुगतान का अदेय प्रमाण-पत्र भी प्रस्तुत किया जाना है।

3. कतिपय जिलो द्वारा आयोग के संदर्भित पत्र के परिप्रेक्ष्य में अदेय प्रमाण-पत्र के संबंध में स्थिति स्पष्ट किये जाने का अनुरोध किया गया है। इस संबंध में स्थिति निम्न उदाहरण से स्पष्ट हो जायेगी :-

- राज्य निर्वाचन आयोग ने नगरीय निकायों के निर्वाचन कार्यक्रम की घोषणा 5 अक्टूबर 2014 को की जिसके अनुसार नाम निर्देशन पत्र दिनांक 21/10/2014 से लिये जावेंगे। माह जिसमें निर्वाचन कार्यक्रम की घोषणा हुई है, का प्रथम दिनांक 01/10/2014 हुआ। अतः इसके 6 माह पूर्व अर्थात्

[Signature]

दिनांक 01/04/2014 तक के सभी विद्युत देयकों के भुगतान हो जाना चाहिये। इसी आशय का अदेय प्रमाण-पत्र आवश्यक होगा।

(नगरपालिका के समस्त शोध्यों के संबंध में स्थिति यह है कि यदि नाम निर्देशन पत्र निर्वाचन हेतु दिनांक 10 अक्टूबर 2014 से भरे जाना है तो वित्तीय वर्ष 31 मार्च 2014 को समाप्त अवधि का भुगतान किया जा चुका हो।)

4. इसी प्रकार जहाँ तक नगरपालिक निगम के करों या प्राप्त धनों का प्रश्न है, उपर्युक्त उदाहरण की स्थिति में, ऐसे समस्त कर या प्राप्त धनों का, जो दिनांक 31/03/2014 तक देय थे, का भुगतान किया जा चुका होना चाहिए। तदनुसार अदेय प्रमाण-पत्र आवश्यक होगा।


नगरपालिका परिषद् एवं नगर परिषद् के मामले में स्थिति पूर्व से ही स्पष्ट है। इनके मामले में भी दिनांक 31/03/2014 तक के शोध्यों का भुगतान आवश्यक होगा।


5. यह उल्लेख करना आवश्यक नहीं है कि उक्त अदेय प्रमाण-पत्र जो नाम निर्देशन पत्र जमा करने के दिनांक तक जारी हुए हो, मान्य होंगे।

- इस संबंध में व्यापक तैयारी तथा उन केन्द्रों से जहाँ से इच्छुक अम्यर्थी अदेयता प्रमाण-पत्र राशि जमा कर प्राप्त कर सकेंगे। नगरीय निकायों से तथा जिलों में स्थित बिजली कार्यालयों से का वार्डवार (वार्डों के समूह का भी हो सकता है) वे प्रकाशित कराकर प्रचार प्रसार करें। ये कार्यालय दिनांक 16/10/2014 से कार्यशील होने चाहिये।

6. प्रकरण को और सूक्ष्मता से परीक्षण किये जाने हेतु म0प्र0 नगरपालिक निगम अधिनियम 1956 की धारा 17 तथा म0प्र0 नगरपालिका अधिनियम 1961 की धारा 35 का सन्दर्भ लिया जाना सुनिश्चित करें।

कृपया पत्र प्राप्ति की अभिस्वीकृति भेजें।


(जी0पी0श्रीवास्तव)
सचिव

 मध्य प्रदेश राज्य निर्वाचन आयोग, भोपाल

70-31-2014



GOVERNMENT OF MADHYA PRADESH
ENERGY DEPARTMENT
MANTRALAYA, VALLABH BHAWAN

29/10
19 OCT 2015

No. F-5/10/2009/13 (Vol-XVIII)

Bhopal dated

To,

1. Sh. Rajesh K. Sinha,
Joint Secretary,
Government of India,
Ministry of Coal,
Shastri Bhawan,
New Delhi - 110001
2. Sh. Anil Kumar Singh,
Joint Secretary,
Government of India,
Ministry of Power,
Shram Shakti Bhawan,
New Delhi - 110001

Sub: - Sampling of coal by third Party Agency engaged by MPPGCL for supply of coal by SECL & WCL-reg.

Please recall the discussions held during the meeting between Hon'ble Chief Minister of Madhya Pradesh and Hon'ble Minister of State for Power & Coal (Independent Charge), Government of India on 15.10.2015 at New Delhi. During the meeting, issue regarding settlement of claims lodged by Madhya Pradesh Power Generating Company Ltd. (MPPGCL), a State PSU, on SECL and WCL, based on the third party sampling carried out at loading end, was inter-alia discussed. It has been agreed that these claims would be settled at the earliest.

It may be mentioned that MPPGCL has appointed CIMFR, a GoI entity, as its third party for sampling of coal at SECL and WCL sidings, for all its thermal power plants. Standard Operating Procedure (SOP), formulated by CIL for sampling work is being adhered by MPPGCL/CIMFR. On the basis of coal sampling carried out by CIMFR, MPPGCL has lodged claims with SECL and WCL for recovery of Rs. 46,40,36,296/- and Rs 1,03,15,439/- respectively towards grade slippage & excess moisture. Coal Companies are being pursued by MPPGCL to issue "Credit Notes" for the claim amount, as per procedure laid down in FSA. However, Credit Notes have not yet been issued on one or the other pretext. Statement indicating details of claims is attached herewith.

In view of the above, it is requested to kindly expedite settlement of the above claims and formulate procedure for timely settlement of such claims in future.

Encl: As above

(Manu Srivastava)
Principal Secretary

Nb. F - 5/10/2009 /13 (Vol-XVIII)

Bhopal dated

17 OCT 2015

Copy to:-

1. The Managing Director, MP Power Generating Company Limited, Jabalpur-
for information and further needful please.

Principal Secretary
Energy Department

OK

महत्वपूर्ण

मध्य प्रदेश शासन
ऊर्जा विभाग
मंत्रालय

क्रमांक 3009/2015/तेरह/
प्रति,

भोपाल, दिनांक 11-5-2015

समस्त कलेक्टर,
मध्य प्रदेश

विषय:-आर्म्स डीलर लायसेंस, शस्त्र लायसेंस तथा खनि रियायत स्वीकृत/नवीनीकरण करने से पूर्व आवेदकों से उनके विद्युत बिलों का नो ड्यूज प्रमाण पत्र प्राप्त करने विषयक।

उपरोक्त विषय के संबंध में गृह और खनिज साधन विभाग के पत्र दिनांक 16.12.2014 एवं 11.11.2014 की प्रतियां कृपया संलग्न कर प्रेषित है। गृह विभाग के उक्त पत्र दिनांक 16.12.2014 के माध्यम से राज्यशासन द्वारा लिये गये निर्णय से अवगत कराया गया था कि आर्म्स डीलर लायसेंस एवं शस्त्र लायसेंस प्रस्ताव को भेजने एवं उनके नवीनीकरण एवं स्वीकृति के प्रस्ताव भेजने के पूर्व अनुज्ञप्तिधारियों से विद्युत कंपनी से नो ड्यूज प्रमाण पत्र प्राप्त किया जाना सुनिश्चित किया जाए। खनिज साधन विभाग के पत्र दिनांक 11.11.2014 के अनुसार खनि रियायत स्वीकृति जारी/नवीनीकरण स्वीकृति जारी करने से पूर्व आवेदकों से विद्युत बिल के भुगतान करने संबंधी नो-ड्यूज प्रमाण पत्र प्राप्त करने की कार्यवाही सुनिश्चित की जाए।

निर्देशानुसार अनुरोध है कि उक्त निर्णयों उपरांत आपके जिले अंतर्गत कुल प्राप्त आवेदनों की संख्या, इन आवेदनों में से ऐसे आवेदन जिन पर विद्युत कंपनी से नो ड्यूज प्रमाण पत्र प्राप्त होने पर लायसेंस जारी किये गये तथा ऐसे आवेदन जिनमें आवेदनकर्ता द्वारा नो ड्यूज प्रमाण पत्र प्रस्तुत नहीं कर पाने पर उनके आवेदन निरस्त किये जाने बावत् जानकारी एक सप्ताह के अंदर विभाग को कृपया उपलब्ध कराने का कष्ट करें।

संलग्न:-उपरोक्तानुसार।

(एम. धरेशवाल)
8/5/15

विशेष कर्तव्यस्थ अधिकारी
म.प्र. शासन, ऊर्जा विभाग

क्रमांक /2015/तेरह/

भोपाल, दिनांक

प्रतिलिपि - अधीक्षण यंत्री (संचारण/संधारण) -म.प्र.पूर्व/मध्य/पश्चिम क्षेत्र विद्युत वितरण कंपनी लिमि.जबलपुर/भोपाल/इंदौर। -~~कलेक्टर~~ कलेक्टर कार्यालय से समन्वय कर उपरोक्त जानकारी प्राप्त कर विभाग को निश्चित समयसीमा में उपलब्ध कराये जाने हेतु कृपया अनुरोध है। उक्त पत्रों की छायाप्रति संलग्न प्रेषित हैं।

विशेष कर्तव्यस्थ अधिकारी
म.प्र. शासन, ऊर्जा विभाग

मध्यप्रदेश शासन
गृह(पुलिस)विभाग
मंत्रालय, वल्लभ भवन, भोपाल

43

क्रमांक 4835 / 6447 / 2014 / बी-1 / दो,
प्रति,

भोपाल, दिनांक 16 / 12 / 2014

- 1- जिला दण्डाधिकारी (समस्त)
मध्यप्रदेश।
- 2- पुलिस अधीक्षक (समस्त)
मध्यप्रदेश।

विषय-आर्म्स डीलर लायसेंस, शस्त्र लायसेंस जारी करने एवं उनके नवीनीकरण के समय उनके विद्युत बिलों का नो ड्यूज प्राप्त किये जाने के संबंध में।

-00-

उपरोक्त विषय में यह निर्णय लिया गया है कि आर्म्स डीलर लायसेंस एवं शस्त्र लायसेंस प्रस्तावों को भेजने एवं उनके नवीनीकरण एवं स्वीकृति के प्रस्ताव भेजने के पूर्व अनुज्ञप्तिधारियों से विद्युत कम्पनी से नो ड्यूज प्राप्त किया जाना सुनिश्चित किया जाए।

(ओ.पी.बाथम)
अवर सचिव

म0प्र0शासन, गृह विभाग

पृ० क्रमांक 4835 / 6447 / 2014 / बी-1 / दो,

भोपाल, दिनांक 16 / 12 / 2014

प्रतिलिपि-

- 1- प्रमुख सचिव (समुन्वय) मुख्य सचिव कार्यालय, म.प्र.शासन, मंत्रालय भोपाल की ओर उनके पत्र क्रमांक 3689/मु.स./14, दिनांक 29.09.2014 के संदर्भ में,
- 2- प्रमुख सचिव, म.प्र.शासन, ऊर्जा विभाग, की ओर उनकी टीप जावक क्रमांक 6922/2014/13, दिनांक 15.10.2014 के संदर्भ में,
- 3- संभागीय आयुक्त (समस्त) मध्यप्रदेश की ओर सूचनार्थ प्रेषित।
- 4- पुलिस महानिरीक्षक, जोन (समस्त) मध्यप्रदेश,

अवर सचिव

म0प्र0शासन, गृह विभाग

मध्यप्रदेश शासन
खनिज साधन विभाग
मंत्रालय

क्रमांक 2582/3431/2014/12/1

भोपाल, दिनांक -11-11-14

प्रति,

- (1) समस्त कलेक्टर
मध्यप्रदेश।
- (2) संचालक,
भौमिकी तथा खनिकर्म मध्यप्रदेश,
भोपाल

विषय :- खनि रियायत स्वीकृति/नवीनीकरण करने से पूर्व आवेदकों से विद्युत बिल के भुगतान संबंधी नो-ड्यूज प्रमाण पत्र प्राप्त करने विषयक।

उपरोक्त विषयांतर्गत लेख है कि माननीय मुख्यमंत्रीजी की अध्यक्षता में दिनांक 24.09.2014 को आयोजित ऊर्जा विभाग की समीक्षा बैठक में यह निर्णय लिया गया है कि खनि रियायत स्वीकृति जारी/नवीनीकरण जारी करने से पूर्व विद्युत बिल के भुगतान संबंधी नो-ड्यूज प्रमाण पत्र प्राप्त किये जाने का निर्णय लिया गया है।

अतः उपरोक्तानुसार खनि रियायत स्वीकृति जारी/नवीनीकरण स्वीकृति जारी करने से पूर्व आवेदकों से विद्युत बिल के भुगतान करने संबंधी नो-ड्यूज प्रमाण पत्र प्राप्त करने की कार्यवाही सुनिश्चित की जाये।

(शिव शंकर शुक्ला)

सचिव

म.प्र. शासन, खनिज साधन विभाग

पृ. क्रमांक 2583 /3431/2014/12/1

भोपाल, दिनांक -11-11-14

प्रतिलिपि -

1. प्रमुख सचिव, म.प्र. शासन, ऊर्जा विभाग, मंत्रालय, भोपाल की ओर उनके जावक क्रमांक 6923/2014/13 दिनांक 15.10.2014 में दिये गये निर्देश के तारतम्य में सूचनार्थ।
2. अवर सचिव (के)/अवर सचिव (एस) म.प्र. शासन, खनिज साधन विभाग की ओर पालनार्थ प्रेषित।
3. गार्ड फाईल।

सचिव

म.प्र. शासन, खनिज साधन विभाग