

Report of the Committee
on
“Power Demand - States/UTs to
initiate innovating schemes to enhance
electricity consumption”



Central Electricity Authority

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1. Introduction:

Ministry of Power vide OM dated 14.09.2016 constituted a Committee comprising of Members from CEA, CERC, FICCI, State of Madhya Pradesh, Gujarat, Tamil Nadu, Bihar, Uttar Pradesh for exploring various options / innovating schemes to enhance electricity consumption for boosting the economic development:

Chairperson, CEA	- Chairman
Secretary, CERC, New Delhi	- Member
President, FICCI	- Member
Additional Chief Secretary(Energy), Govt. of Madhya Pradesh	- Member
Principal Secretary, Energy Dept., Govt. of Gujarat	- Member
Secretary(Energy), Govt. of Tamil Nadu	- Member
Secretary(Energy), Govt. of Bihar	- Member
Principal Secretary(Energy), Govt. of Uttar Pradesh	- Member
Chief Engineer(PFAM), CEA	- Member Secretary

Copy of the MoP OM dated 14-09-2016 is at **Annexure-1**.

2. Facts About Power Sector

- The average per capita electricity consumption in India was about 1075 (2015-16) units which was much lower than the world average.
- About 18452 villages and about 7.50 crore Rural households are yet to electrified (Census 2011)
- The installed generation capacity in the country is 308.8 GW against the demand of 153 GW during the year 2016-17 (as on 30.11.2016).
- The Shortage in terms of Energy and Peak Demand during April-November 2016 is 0.7% (5,421 MU) and 1.6% (2,608 MW) respectively, as compared to 2.3% (17,264 MU) and 3.2% (4,903MW) respectively during the same period last year. Power scenario both in terms of Energy and Peak Demand has improved this year as compared to last year (2015-16).
- Total Generating capacity of about 19,000 MW is lying idle due to Reserve Shut down/ non requisition by beneficiaries and about 7,000 MW capacity is impacted due to Low System demand.
- All India Average PLF of Thermal Power Stations is 59.48% during the period Apr-November 2016.

- Some states have surplus power availability but there are power shortages/load shedding in some other states.
- Some of the states including North Eastern states are not able to utilise the power from other parts of the country because of inadequate intra-state transmission system.
- Upon addition of 175 GW renewable energy by 2022, the country is expected to have much more surplus power mostly during day time due to solar generation.
- Government of India has taken an initiative under Digital India Programme and launched a Mobile App on 31st March, 2016 named as “Vidyut Pravah” to make general public aware about the electricity availability, price of the electricity in power exchange, real time demand and demand comparison with previous day etc. In addition, some other information like data pertaining to peak and energy shortage for previous day at all India and State level is also being provided by this App.
- GOI has launched UDAY scheme for Financial Restructuring of Discoms through various measures which also include reduction of cost of power like allowing flexible utilization of coal, rationalization of coal and procurement of power through competitive bidding route etc.

3. Factors affecting electricity consumption

It is a fact that the consumption of energy is influenced by various factors. Some of the observable factors are

- ✓ availability of electricity,
- ✓ Financial condition of Discoms
- ✓ affordability of the consumers,
- ✓ price inelasticity of demand
- ✓ tariff incentive for high consumption,
- ✓ economic activities of locality,
- ✓ climatic conditions / random disturbances, and
- ✓ various other miscellaneous factors such as reliability & quality of power supply, strengthening & augmentation of transmission & distribution networks, outage management and fault repair systems etc.

4. Measures already taken-Power For All initiative(PFA)

Power for All Document being prepared with a joint initiative of Government of India and State Governments/UTs is an action plan Document for providing 24x7 access to electricity to all consumers, except agriculture consumers by 2019. Implementation of the identified action plans will have impact on the consumption as well as

Demand/Energy requirement. This initiative aims at ensuring uninterrupted supply of quality power to existing consumers and providing access to electricity to all un-connected consumers by 2019 in a phased manner. So far, action plan documents for 35 States and UTs (except Uttar Pradesh) have been prepared and signed by the respective States and UTs.

In preparation of PFA documents, the energy consumption has been assessed as below:

- a) an estimate has been made for the number of total households (HH) to be covered by the respective States/UTs in a phased manner by 2019 and its year wise electrification programme.
- b) the projection on Energy Consumptions for States/UTs, considering 24x7 requirement and specific consumption by each connected household (separate for Rural and Urban) is upto 2018-19 and the same have been assessed in consultation with the States/UTs.
- c) for the categories other than the domestic, Compounded Annual Growth Rate(CAGR) has been calculated by considering historical growth rate and then moderating it for 24x7 requirement, in some cases with the consultation of States.

The state wise specific consumption is given in **Annexure-2**.

Based on the requirement, State wise Action Plan has been drawn which will be executed by the State Govt. with the support of Govt. of India, wherever necessary, as per their approved plans, schemes and policies. This joint initiative of Government of India and State Government aims to enhance the satisfaction levels of the consumers, improve the quality of life of people, and increase the economic activities resulting into inclusive development of the States.

The Central and State Governments are meeting regularly to review the progress of the Rollout Plans & related milestones envisaged in the documents. Respective Governments would strive to achieve the objectives by taking the necessary steps. PFA is ambitious initiative and the demand projected is delayed /shifted to for various reasons of implementations and therefore, there is need to have more focus on increase in industrial commercial and Service sector for quantum change in consumption. In addition, steps also need to be taken towards increasing the specific consumption by each household and increase in consumer base and other areas.

The committee held two meetings on 08-11-2016 and 06-12-2016 at CEA New Delhi for deliberation of the issues and finalization of the report.

The Committee based on the discussions in the two meetings indicated above, has recommended the following measures to address the areas of Regulatory and tariff issues, Policy issues, Social issues and Discoms issues etc. for enhancing consumption as short term (less than 01 year), medium term (01 to 03 years) and long term measures (beyond 03 years):

5. Short Term measures:

5.1 Rationalization and Restructuring of Tariff :

a) Tariff for surplus scenario:

The present tariff structure in vogue is designed for shortage scenario of power in States of India. The scenario has since improved and as such the existing tariff structure needs to be redesigned for surplus scenario so as to encourage the consumption. Tariff structure prevailing is mostly Telescopic in nature generally for all categories of consumers, which penalizes the higher consumption through higher rates, rather than providing incentive for more consumption. Rebate in the form of incentives in bills can be offered over and above predetermined level of consumption so as to facilitate considerable growth in consumption by the consumers.

Action: State Electricity Regulatory Commissions (SERCs) depending on the present situation of power scenario & the likely projections for future in the respective States/UTs need to review the existing tariff structure for promoting consumption by all consumers, particularly by industrial, commercial and service sector consumers. Introduction of Rebate/ Incentives for higher level of consumption by consumers may also be considered by the State Govt./SERCs.

b) Tariff for off-peak - Time of Use:

High Tension consumers due to the higher tariff applicable to them opt for power purchase through intra/inter-state open access for meeting the full or part of their power requirement during peak/off peak time. Implication of cross subsidy surcharge on such transactions & limited access to network, however, have limited such options but electricity consumption growth is not happening due to such higher tariff. Tariff at lower rate during night/off-peak hours in a particular State would induce industries to operate more during night shift & leading to higher consumption of electricity and greater production at lesser rate boosting economy also. As per CEA publication on “Electricity tariff and duty and Average rates of Electricity supply in India (March 2015)”, the TOD tariff is already in use in about 16 States. State of Madhya Pradesh has already enhanced the consumption of Industrial consumers by offering of Rs.0.50/KWh incentive during off-peak period recently which has resulted in additional 370 MUs consumption during a short span of 5 months only. Such rationalization of Tariff needs to be done by SERCs for enhancing consumption during off peak time.

Action: Incentives in the form of attractive tariff such as decreasing rate for higher consumption slab and rebate, reduced tariff during off-peak hours etc. may be given to industrial, commercial & Service sector consumers in the tariff regulations to promote consumption. This will also facilitate absorption of the excess / Un-requisitioned power in the State at overall reduced rates to the consumers in various categories.

Apart from Time-of-Day Tariff, suitable incentives are necessary to encourage industrial, service sector and commercial consumers to adopt interruptible load programmes and compensate them against buy-back of demand as and when the situation will warrant. Domestic consumers, too, will need to be incentivised by a monetary arrangement under retail tariff if they opt for load shifting to meet the Discom's system requirements. Another component to be examined is in the context of Demand Side Management and Demand Response Systems, which collectively will enable Discoms to shape their load curve as well as manage peak loads.

Action: SERCs may allow incentives in the form of attractive tariff such as decreasing rate for higher consumption slab and rebate etc during off peak time for industrial, commercial & Service sector consumers etc to promote consumption.

c) Cross-Subsidy in Intra Consumer Category:

Retail tariff in India is driven by socio-economic considerations and has to factor in the paying ability of the poorer section of consumers. However, a rational approach is necessary to lessen the cross-subsidy burden borne by large consumers, particularly industrial and commercial establishments, who have been historically cross subsidizing the domestic & agriculture consumers. The huge level of cross subsidy from Industrial to agricultural consumers is clearly visible from some of the major States (source - Performance of State Power Utilities for the years 2012-13 to 2014-15 published by PFC) in table below:

State	Agriculture Consumers		Industrial Consumers	
	(%) of total Energy sold-MKwh	(%) of total revenue Rs. Crs	(%) of total energy sold-MKwh	(%) of total revenue Rs. Crs
Gujarat	25%	13%	47%	62%
Haryana	25%	2%	27%	34%
Karnataka	36%	23%	20%	27%
Maharashtra	28%	14%	31%	41%
Madhya Pradesh	39%	16%	21%	35%
Telangana	31%	3%	28%	43%

Further, Economic Survey 2015-16 has observed that both high tariff and erratic supply are acting as deterrents to industrial electricity purchases from utilities, as a result of which there is a gradual transition towards captive generation. To ameliorate the situation, Economic Survey has proposed intra-category cross-subsidisation and higher tariff progressivity within the same category of consumers, implying that within the same category, there will be a higher ratio of tariff charged to the richer cross-section relative to the poorer cross-section. In effect, cross-subsidisation will largely occur within the Consumer category, leaving aside the industrial and commercial consumers, who will account for bulk of the electricity sales and can be offered tariff reflective of cost of service. As the Survey suggests, regulators will need to undertake a basic welfare analysis before

deciding on the option so that it is revenue-neutral to Discoms while due relief is provided to the poorer section of consumers.

Action: State Govts. may issue appropriate guidelines to respective SERCs to carry out basic welfare analysis for intra-category cross-subsidisation and higher tariff progressivity within the same category of consumers.

d) Tariff for Charging facility of Electric vehicles

Promoting use of electrical buses, car, e-rickshaw and bikes etc and making provision of charging stations (like petrol pumps) would help in enhancing the use of these vehicles and also enhance the electrical consumption in a greener way. Govt. of India has been promoting above clean transport in cities, which are normally driven by battery and CNG but vehicle with high capacity battery charging requirement in electric public transport system with buses, cars etc. which can run over large distances in single charging is simultaneously required to be developed and implemented.

As per the National Electric Mobility Mission Plan-2020, about 6-7 Million new electric(battery electric plus hybrid) vehicles have been projected to be sold in India. These vehicles are required to be charged at regular interval. At the same time, charging facilities for such battery driven vehicles have not come up in time, leading to unsafe and illegal charging of these vehicles. Central Government may promote development and use of State/Discoms may promote and facilitate recharging of such battery driven vehicles by creating charging facilities at suitable locations in cities such as parking locations in Societies, Markets, Metro Stations, Hospitals, Bus stands etc as per requirement. In the rural areas also, the same model can be replicated by providing charging points for such battery driven vehicle for the convenience and this will increase the economic activities of Rural people. Government of Madhya Pradesh has proposed in its retail tariff proposal before MPERC for 2017-18 to acknowledge charging of battery-operated vehicles through the existing connection using the same applicable tariff and specific charging outlets on commercial rates.

Action: State/Discoms may take up with respective SERCs for appropriate tariff for facilitating recharging of battery driven vehicles in cities and Rural areas and creating infrastructure for charging of such vehicles.

e) Tariff design/incentive for Cooking use:

Most of the households use either LPG, PNG or Kerosene for cooking/heating, as rates are low due to offered subsidy by Govt. or by popular choice of availability in the country. Data of Census 2011 reveals that only 0.1% of Total Households (of 24,66,92,992), which works out to 2,46,693 Households are using electricity as fuel for cooking purpose. Such

a huge non-electric energy consumption in Cooking can be easily shifted to electrical cooking consumption by suitable tariff design for domestic consumers so that expenses from electricity consumption and those through LPG or Kerosene consumption are comparable and by promoting use of Kitchen/ cooking appliances with suitable awareness for use.

In addition, commercial establishments such as small restaurants, hotels, Dhabas, Mega Kitchens etc. using LPG for commercial purpose can also be targeted to shift to electricity as cooking fuel for their day to day business. The present requirement of installation of PNG and transportation of inflammable material (LPG cylinders) with risk involvement could be avoided completely, and the savings thereof can be used for other purposes. Appropriate enabling policy to use electricity as cooking fuel in Households and commercial establishments is the need of the hour. SERCs are also required to provide suitable tariff for incentivizing the use of electricity as cooking fuel. In addition, Subsidy and cross-subsidy part of the tariff as applicable for Below Poverty Line(BPL) and other lifeline consumers may also be continued by State Govts as per their policy.

Action: Governments in Centre and State may come out with suitable policy to use electricity as cooking fuel in Households and commercial establishments along with direction to SERCs for proper tariff design and incentives.

5.2 Load forecasting (Assessment of demand)-Adequate procurement of Power:

As a functional discipline, Discoms should follow scientific techniques to undertake demand forecasting for meeting the requirements of base loads and seasonal loads. Performance metric is to be designed so that Discoms can transparently demonstrate the efficacy of their power procurement planning to meet the forecasted load. The basic objective will be to ensure that there is no un-served or un-met demand caused by inadequate planning of power supply. Load forecasting doesn't have any direct impact on consumption, but will ensure sufficient availability of power for any increase in future consumption. The Discoms of the States which had forecasted/assessed their demand accurately adopting scientific techniques have seen increase in consumption considerably due to better power availability management to meet the increased forecasted/assessed demand.

Action: Discoms of the States should switch over and adopt the scientific techniques for forecasting/assessment of the demand accurately so as to serve the consumers with better supply availability

5.3 Retention of BPL consumers

Under Deen Dayal Upadhyaya Gramin Jyoti Yojna(DDUGJY), BPL households are given electricity connection free of charge. However, due to delay in taking over of assets by

Discoms of States, there is a delay in updating of consumer database and consequently, the bills for BPL alongwith APL consumers are not generated on time, leading to accumulation of unbilled amount. BPL consumers and other Rural consumers are not able to pay their bill in one go leading to levying of late payment surcharges for delayed payment. In such cases, where there is no delay on the part of consumers, State Govt. in consultation with SERC may consider exempting such late payment surcharges and also allow payment of bills in installments alongwith the current bills. This would retain the consumers and increase the consumption also.

Further, due to delay in such handing over, there is also delay in restoring normal condition in case of failure of Distribution transformer & other problems leading to no supply, and thereby electricity is not consumed by these affected consumers. The redressal of complaints is also not available easily or nearby in rural areas for which such issues remain unattended and delayed. To help the consumer, consumer care centres as well as fax/call centres in rural areas are not easily available to address these issues. Mobile (van)/facility for redressal of such grievances may be introduced by Discoms, which on monthly basis may visit the effected rural areas and address the grievances.

Action: Discoms of States to updated consumer base for metering, billing and also for consumer grievances after taking over/installation of the Electrical Infrastructure under DDUGJY scheme without delay.

5.4 Awareness and Campaign by Discoms/Power Departments

States/Discoms are indulging in load shedding/ power cuts in rural areas to limit the Commercial losses due to high theft and pilferage of electricity. In some states this is being done in the name of regulatory power cuts. The consumers in these areas do not get adequate supply of electricity during 24 hours. The functioning of Public facilities is affected and efficiency reduced. The commercial activities are also affected. States/Discoms may organize camps to create awareness among the public to refrain from theft and pilferage, and to avail the benefit of 24hours supply by them. This measure would help in providing 24x7 power supply to all consumers including small industries in rural area and may result in higher electric consumption with increased economic activities.

Action: States/Discoms may launch initiative for creating awareness among the people in association with the members of local bodies of the Village/areas which will help in curtailing the theft and pilferage of electricity and improving the consumption with better supply during 24 hrs.

5.5 Local Markets & public services facility

The local markets in the villages and semi urban areas are normally held during evening time for selling the village produce and these shopkeepers normally depend upon the kerosene operated small DG sets due to irregular and inadequate electricity supply from the utility which is creating pollution and is expensive also. Such places may be provided

with facilities for energy efficient lighting in consultation with the Villages Panchayats/Local bodies. Such facilities would promote more activities in these areas.

The temples, schools, community centers & other public services in village areas and semi urban areas are normally do not have necessary lighting, particularly in the villages electrified under State plan and which leads to reductions in day to day activities during evening or night time with added fear of insect bites etc. Even for villages electrified under Central schemes, the electrification of these public places is required to be reviewed in rural and semi urban areas regularly and necessary action for maintaining the electricity connections or augmenting the supply may be taken by State/Discoms.

Action: States/Discoms may in consultation with the Village Panchayats/Local bodies may create facilities for energy efficient lighting for such market areas and public places to promote public/commercial activities and hence, the electricity consumption.

5.6 Make in India/Startup India initiative

Government of India has launched Make in India Initiative and for better use of this initiative, small scale/large scale industries may be promoted to make all sort of goods in India This initiative will help increase the electricity consumption by such industries. Tax holidays, land for such industries at cheaper rate or nominal lease, speedy clearances of necessary approvals/license would also help to increase industrial activities and thereby, the consumption of electricity in a speedy way.

Action: Central Government and States Governments may promote and facilitate setting up industries for manufacturing under Make in India initiative by providing incentives such as Subsidy and Tax holidays etc.

5.7 Discom attitude change towards consumers

Change of mindset amongst Discom personnel from non-friendly behavior towards consumer needs to be changed to move towards friendly behavior encouraging the consumption. In case of requirement of power on short notice and for short duration, the Discom personnel, generally, do not facilitate this in time and the consumers need to opt for some other sources. Similarly, for issues related to new connection, Shifting, disconnection and reconnection etc. also timely responses are required from Discom. In many parts of the country, the rural area consumers are not accessible to the grievance redressal mechanism through Consumer Grievance Redressal Forum(CGRF) and Ombudsman as these are located in cities away from Rural areas. These aspects are duly covered under the Electricity supply code and Standards of Performance issued by SERCs.

Action: Discom may issue proper guidelines to its staff for meeting the consumer's requirements including grievance measures based on the Electricity supply code and Standards of Performance issued by SERCs. SERCs may also need to monitor these aspects for strict compliance

6 Medium Term Measures

6.1 Quality and Reliable Power supply

The power supply in most of the areas including the rural areas has been inadequate and unreliable, which may be due to interruptions in power system network due to power system faults, equipment failures and control malfunctions, overloading of the Distribution networks, Power availability constraints and sometimes Regulatory power cuts etc. These factors- i.e. unreliable power & inadequate power supply have been a deterrent for financial activities for population in Rural Areas.

Adequate quantity of Reliable & quality electric supply and its proper tariff are the basic requirements for setting up of Industrial and commercial units. In case, these conditions are not met, these consumers invariably shift to DG set and captive plants for adequate, continuous and reliable power as process cost of shutdown due to power failure is very high. These DG sets contribute substantially to consumption of diesel & environmental pollution. Most industries dealing with petrochemical or hazardous chemicals cannot restart the process immediately after restoration of power supply and in turn these incur heavy losses in production, cleaning/maintenance, breakdowns etc. The reduction or prohibition of DG sets can be accomplished only if uninterrupted/reliable power is supplied to industries.

As per the data available as on 16th December 2016 on website of IPDS for 20793 feeders covering 25 states and 43 Discoms (under RAPDRP towns), about 979 feeders have average outage duration of more than 30hours in a month and about 968 feeders have frequency of outages more than 30 times during the month, which gives clear indication of inferior quality and un-reliable electric supply. In order to improve the Quality and Reliability of Rural Power Supply, Central Govt under its DDUGJY and IPDS scheme, has sanctioned the works for strengthening & augmentation of distribution system to all the states and UTs. State/Discoms shall have to complete these works considering the factors such as level of reliability and flexibility required, along with the work of segregation of feeders dominated with Agricultural loads into Agricultural & non- agricultural feeders segregation under DDUGJY in priority so as to ensure adequate & reliable power supply in such rural and urban areas for higher consumption.

Action: State/Discoms may expedite execution and completion of works under DDUGJY and IPDS scheme and under the schemes/plans under States for strengthening & augmentation of distribution system including segregation of feeders for ensuring adequate, reliable and quality power supply in such rural and urban areas.

6.2 Increase in customer base and specific consumption -New Connections-Rural and Urban consumers

As per census 2011 data about 7.50 Crore Households in Rural areas are still to be electrified. To facilitates electrification of these households, State/Discoms to expedite the execution of works of electrification of electrified Villages and strengthening &

upgradation of electrical infrastructures in Partially Electrified Villages already installed during RGGVY period. During RGGVY period, the infrastructure created was adequate for meeting the 10% of households in the villages. This implies that 90% of households in these electrified villages do not have access to electricity. This will also expedite providing electric connection to all the 4.27 Crores of BPL households covered (connected only 2.50 crores up to 30-11-2016) covered under DDUGJY scheme.

The APL households on the other hand need to apply for electric connection, and depending on availability of electrical infrastructure, connections are released by Discoms after fulfilling some conditionalities and taking connection charges as specified by SERCs. Sometimes, APL households are required to pay the connection charges which are quite exorbitant and cannot be affordable. APL households are also sometimes unwilling to avail electricity connection. Therefore, the requirement for higher payments for connection charges such as for erecting a poles, lines and service wires and security deposit should be eased by introducing schemes payment of fixed rate of connection charges for providing electricity connections to APL households by SERC of the States. Further State may also consider promoting installments based easy payment facility for payment towards connection charges to facilitate universal electrification to Rural households.

For implementation of above suggested methods of Fixed rate of connection charges, one prior requirement would be that State/Discoms shall have to install adequate electrical infra-structure facility including Distribution transformer capacity in inhabited locality under DDUGJY scheme and under State plan, so as to meet the minimum estimated requirement of BPL/APL households and public service facilities (BPL-250Watts, APL-500Watts, public facilities-1000Watts and estimated future growth also) to facilitate Power For All (PFA) and access to all Households(HHs).

Action: a) State/Discoms may expedite the execution of works of strengthening & upgradation of electrical infrastructures in Partially Electrified Villages already installed during RGGVY period with adequate capacity and electrification of unelectrified Villages.

b) Discom may propose to SERC for introduction of payment of fixed rate of connection charges for providing electricity connections to APL households and for allowing installment facility for connection charges for Rural consumers.

6.3 Use of Smart meters

As proposed under National Tariff Policy, Discoms should take up progressive introduction of Smart Meters starting with consumers having monthly consumption of 500 units and above by December 2017. These meters will have the feature of generating behavioral response from consumers and enable demand moderation if a regime of real time pricing can be introduced. Consumers will be able to make intelligent choices about the time of use of their energy-intensive appliances under dynamic pricing, and thereby, increase their electricity consumption while taking the benefit of Time-of-Day Tariff. Discoms will benefit by way of improved peak load management.

Smart Meters will also provide the facility of integration of business processes with network and consumer data and thereby, enable the improvement of service delivery by Discoms under metering and billing as well as outage and trouble call management. Firstly, prompt response against outages can be ensured to minimise interruptions and network downtime, leading to higher energy consumption in the system. Secondly, real time information will improve metering and billing as well as complaint and grievance handling, leading to higher customer loyalty and retention of Discom loads. With enhanced service proposition, Discoms will be better positioned to retain large consumers who have the flexibility of investing in captive generation or migrating alongwith the support of tariff rationalisation to alternative sources of supply.

Customer loyalty and thereby, securing the energy consumption can be further enhanced as Smart Meters will offer the feature of providing consumers with a digitised experience of undertaking their 'Personal Energy Management' via self-serve options. Discoms will be required to upgrade their IT and communication systems and introduce interactive application software, including mobile apps, so that consumers can visually see their real time energy usage on a 'Home Display Unit' integrated with the Smart Meter, analyse their consumption patterns and choose their usage and billing options.

Action: Discoms will be required to undertake re-engineering of their business processes and introduce the necessary hardware and software to achieve the required level of process automations in order to leverage the benefits offered by Smart Meters

6.4 Reducing Captive Generation

Generally captive generation is being used by the various industries to meet their own consumption with the standby arrangement of grid supply of Discom for various reasons which may be due to higher tariff, inadequate supply, unreliable and of poor quality etc.

At Present, the consumption by captive load is not accounted as consumption by Discoms. Whereas, all the captive load is met through captive generation, there is always the differential balance (positive or negative) power which flows into/from grid. Though the captive generation cost may be slightly higher, still the industries get continuous power without interruptions from their own captive generation. Reduction in use of the captive generation can be accomplished by supplying adequate 24x7 basis, reliable and quality power to industries using captive power at compatible/comparable rates. Madhya Pradesh has proposed a rebate of Rs 2 per unit for consumers switching over from captive to utility supplies in its retail tariff proposal for 2017-18. Steps such as providing better quality and reliable power supply with adequate quantity and better tariff by State/Discoms may lead to shifting of these consumers to grid source from captive source. Moreover, it is also proposed that duty and cess on captive generation should be enhanced to the extent that it becomes prohibitive for captive generators to continue the captive generation.

Action: a) SERCs may with appropriate tariff in Tariff Regulations and through effective provisions in Electric supply code and Standards of performance regulations, ensure for

better quality and reliable power supply with adequate quantity and shifting of Captive consumers.

b) States may impose duty and cess on captive generation so that use of captive generation becomes uneconomical and unviable.

6.5 New Cold storage facilities

In Rural areas and coastal areas, there is a need for Cold storage facilities for preserving vegetables and fruits etc. for requirement during off seasons. Cold storages will help farmers and fishermen in increased business and also increase the electricity consumption. Further many cold storage industries (for chemicals, medicine, vaccines, ice making, fishing, milk etc.) use diesel generators for refrigeration supply as backup due to non-reliable power supplied to it by grid. Due to such unreliable power supply, new cold storage plants are not coming up adequately. State/Discoms may ensure adequate 24x7 basis reliable and quality power to Cold storages, which will help farmers and fishermen in increased business and also there will be increase the electricity consumption.

Action: State Government may plan & promote for setting up such cold storages in rural/semi urban area and may also provide 24x7 quality power.

6.6 Lift irrigation

Water can be stored at large heights in the overhead tanks for irrigation purpose with the help of large HP pumps so that it can be used for longer distances with the pipeline laid in the fields whenever required and in the event of absence of power. This would reduce water scarcity and effective use of extra water which is normally flows away without making it use in rainy season. It's just like water harvesting scheme for agriculture.

Action: States may promote such irrigation schemes in the State for benefit of people as well for increased consumption of electricity.

6.7 Promoting Electric operated construction machinery

In semi urban/urban areas, there are lot of building construction activities are going on which require huge power. Most of the heavy works are done through cranes which depend on diesel as main source of power due to the reason that construction sites such as metro railways sites, building construction etc do not have access to electricity. Discoms wherever electricity is accessible is charging higher rate for consumption and also for security deposits under temporary category. These heavy machineries can be replaced with electric operated machineries so that effective usage of electricity can be done, if Discoms/Power departments facilitates such construction sites with providing power connection through Portable/Mobile Transformer facilities alongwith cheaper payment terms.

Action: Discoms/Power departments may facilitate construction sites with providing power connection through Portable/Mobile Transformer facilities alongwith cheaper payment terms enabled by SERC regulations.

6.8 Trading of power with neighboring countries

Excess power as available in many States has to be backed down due to low demand or due to transmission constraint/congestion towards deficit areas. If sufficient transmission network is available, then most of the surplus power including Un-requisitioned Surplus(URS) can be wheeled to power deficit neighboring countries in the region. Nepal, Bangladesh, Sri Lanka, Myanmar, Pakistan etc. are having power deficit as such there is potential to export electricity to these neighboring countries. For enhancing demand/better utilization of power plants in India, efforts should be made to increase the export of electricity to the neighboring countries. At present there are Memorandum of understanding (MoU)/Power trade agreement (PTA) between India and neighboring countries like Bangladesh, Bhutan, Myanmar and Nepal and there is a SAARC framework agreement for Energy Cooperation (Electricity) with SAARC countries. In order to promote cross Border trade of electricity Ministry of Power on 5.12.2016 has issued the guidelines. Member (Power System), CEA, has been designated as the “Designated Authority” to facilitate the process of approval and laying down the procedure for cross border transaction and trade in electricity for which CERC is also required to bring out the related regulations.

Action: (a) CEA to prepare approval process/procedure and (b) CERC to bring out the related regulations facilitating cross border trade of electricity.

7. Long Term Measures

7.1 Electrification of Railways

The consumption on Traction is only 1.79 % of all India Consumption during 2013-14. As per the information available in the websites- <http://www.irgreenri.gov.in> for INDIAN RAILWAYS GREEN ENERGY INITIATIVES, about 65.4% of freight traffic and 51.2% of passenger traffic is hauled on 39.2 % of electrified network presently (upto 2013-14) , which implies that about 60 % of railway routes Diesel engines have been used by the Railways. There exists huge scope for increase in electrical consumption in Indian Railways through electrification of rail routes as about 60% routes are still to be electrified. The dedicated freight Corridor being planned by Railways has the proposal for electrification of Railway. The Konkan railway route completed 10 years back has no provision for electric traction.

Partially offsetting this diesel consumption and electrifying railways will result in increase in demand. The Electric traction appears to be more economical and this would play vital role in improving the Operating Ratio. This fact has also been found by the study by TERI, which is about three times more energy efficient than diesel traction. The electrification of railways track will not only increase the consumption of electricity but also add to the benefit of Railways and other sectors due to saving of the Diesel fuels.

Action: Indian Railways may expedite the laying of electric overhead traction lines for the remaining lines on priority basis.

7.2 Connecting Decentralized Distributed Generation (DDG) with Grid

The villages/hamlets located in isolated area, where the population is too small or village /hamlets are far away, electricity connection to from grid is not cost effective, and therefore such population remain un-electrified. DDG or smart grid are being used wherein most of the generation (renewable sources such as Small hydro / Diesel generating sets powered by biofuels / Diesel, generating sets / gas engine powered by producer gas generated through biomass gasification, Diesel generating sets / gas engine powered by biogas (animal waste) / Solar photo voltaic / Wind hybrid systems / Other hybrid options, including any new technology; etc) is used at the point of consumption. The supply system through DDG has a limited supply capacity for limited duration depending on type of generating system used and therefore the latent demand of these localities are not coming up fully. To meet the full latent demand round the clock, the cost of infrastructure required viz. battery bank, network etc. is expensive and maintenance of such equipment in in those isolated area is difficult.

Action: States/Discoms may make efforts to bring out such latent demand by connecting them with grid supply system suitably.

8. Summary & Recommendations

Committee recommends that there exists huge potential for enhancing the electricity consumption mainly through Restructuring tariff category, cross-subsidy in intra consumer category, Rationalization of Tariff, rational subsidy management, Improvement of quality and reliable Power supply, improvement in demand forecasting and power procurement planning, Increase in customer base in household area, awareness & campaign by Discoms in States involving of Local bodies, providing local Markets & public services facility with electricity facilities, use of electric vehicles & creating charging facility, railways traction electrification, some new areas for increasing energy consumption, improving Discoms attitude & grievance redressal measures etc. All these measures are categorized into Long Term measures, Medium term measures and Short term measures covering the areas of Tariff, Policy measures, technical measures and Administrative measures etc.

Ministry of Power may like to accept and initiate implementation and/or issue suitable directions to concerned for implementation of the recommended measures to enhance electricity consumption, thereby boosting economy growth. Immediate implementation of short term measures is like to lead to enhanced electricity consumption with a year. The implementation of medium and long term measures, however will take time upto 3 years in case of medium term and more than 3 years in case of long term measures and the impact on electricity consumption will be witness later.



सं. 11/1/2016-ओएम
भारत सरकार
Government of India
विद्युत् मंत्रालय
Ministry of Power

श्रम शक्ति भवन, रफी मार्ग, नयी दिल्ली-110 001
Shram Shakti Bhawan, Rafi Marg, New Delhi-110 001

Dated: 14th September, 2016

OFFICE MEMORANDUM

Subject: Power demand – States/UTs to initiate innovating schemes to enhance electricity consumption -reg.

Central Government had taken a joint initiative with the state governments to prepare Action Plans for all the States / UTs for providing 24X7 Power for All (PFA). Accordingly Power Demand in the States/UTs is expected to increase. Further, In order to boost the economic development, there is a need to explore various options for increasing usage of electricity and enhance electricity consumption.

2. It has been therefore, decided by the competent authority that a committee consisting the following members be formed to recommend innovating schemes to enhance electricity consumption in the States/UTs.

(i)	Chairman, CEA	-	Chairman
(ii)	Secretary, CERC	-	Member
(iii)	President, FICCI	-	Member
(iv)	Principal Secretary (Energy), Govt. of Madhya Pradesh	-	Member
(v)	Principal Secretary, Energy Dept., Govt. of Gujarat	-	Member
(vi)	Secretary (Energy), Govt. of Tamil Nadu	-	Member
(vii)	Secretary (Energy), Government of Bihar	-	Member
(viii)	Principal Secretary (Energy), Gov.t of Uttar Pradesh	-	Member
(ix)	Chief Engineer (GO&D)	-	Member Secretary

3. The committee would submit its report in two (2) months.

4. This issues with the approval of Secretary (Power).

(D. Guha)
Under Secretary to Govt. of India
Telefax: 23719229
Email: opmonitor-power@nic.in

1. Chairman, CEA, Sewa Bhawan, R.K. Puram, New Delhi-66

Estimated Per day consumption per household in urban and rural areas									
Sl. No.	States	2015-16		2016-17		2017-18		2018-19	
		Rura	Urba	Rura	Urba	Rura	Urba	Rura	Urba
1	Karnataka	1.31	3.30	1.45	3.62	1.60	3.97	1.77	4.35
2	Sikkim	3.50	5.26	3.60	5.32	3.70	5.36	3.80	5.40
3	Gujarat	1.50	4.03	1.62	4.36	1.75	4.71	1.89	5.08
4	Bihar	1.60	5.00	1.90	6.00	2.20	6.50	2.50	7.00
5	Telangana	1.62	4.68	1.85	5.26	3.36	5.90	3.56	6.60
6	Meghalaya	1.53	6.45	1.60	6.91	1.66	7.39	1.73	7.91
7	Maharashtra	1.71	3.22	1.85	3.47	2.00	3.75	2.16	4.05
8	Jharkhand	1.87	4.42	2.21	5.49	2.55	6.57	3.00	8.00
9	Assam	1.71	3.36	1.95	3.83	2.19	4.30	2.43	4.77
10	Chhattisgarh	1.93	7.46	2.00	7.87	2.07	8.30	2.15	8.75
11	Rajasthan	2.30	6.10	2.50	6.80	2.80	7.40	3.00	8.00
12	Uttarakhand	2.42	4.90	2.59	5.24	2.77	5.61	2.97	6.00
13	Odisha	2.30	4.70	2.42	4.98	2.54	5.28	2.67	5.60
14	Haryana	2.50	6.80	2.70	7.40	3.00	8.20	3.30	9.00
15	Kerala		3.55		3.80		4.07		4.35
16	Punjab	4.43	6.93	4.87	7.49	5.36	8.09	5.89	8.73
17	Goa	4.85	5.09	5.02	5.27	5.20	5.45	5.38	5.64
18	Arunachal	0.8	3.05	1.02	3.88	1.34	4.98	1.69	6.01
19	D & N Haweli		5.09		5.56		6.07		6.63
20	Lakshadweep(all)		4.91		5.09		5.29		5.50
21	J & K	3	5.2	3.7	5.9	4.3	6.6	4.9	7.4
22	Madhya Pradesh	1.67	4.16	1.89	4.34	2.14	4.52	2.43	4.71
23	Mizoram	1.7	4.63	1.85	5.23	2.05	5.91	2.25	6.68
24	Himachal Pradesh	1.63	6.29	1.76	6.52	1.9	6.75	2.05	6.99
25	Delhi		9.05		9.05		9.05		9.05
26	Daman & Diu		5.27		5.51		5.76		6.03
27	Chandigarh		11.29		12.13		13.03		14
28	Tripura	1.32	4.31	1.39	4.66	1.46	5.03	1.53	5.43
29	Tamil Nadu*	1.95	4.49	2.05	4.71	2.15	4.95	2.26	5.2
30	Manipur	1.33	2.58	1.53	3.1	1.76	3.41	1.84	3.75
31	Uttar Pradesh**	2.78	5.82	3.31	6.61	3.36	6.93	3.74	7.82
32	Puducherry		5.87		5.95		6.04		6.12
33	A & N Islands	2.47	3.96	2.59	4.16	2.72	4.37	2.86	4.59
34	West Bengal	1.28	3.44	1.33	3.49	1.38	3.54	1.43	3.59
35	Nagaland	1.96	5.88	2.2	6.64	2.46	7.5	2.76	8.48

Note: Specific consumption for Andhra Pradesh is not available in PFA document

* Tentative figure - PFA document is under finalization

**Tentative figure – PFA document will be finalized on change of consultant